BUREAU OF RECLAMATION

YUMA COUNTY AIRPORT AUTHORITY

ENVIRONMENTAL ASSESSMENT

ADOT GRANT NO.E5S2Z

Final Report

ROLLE AIRFIELD

SAN LUIS, ARIZONA | APRIL 2017

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Yuma County
Yuma International Airport
PORT OF OPPORTUNITY
Airport Authority

ARMSTRONG

Environmental Assessment
Rolle Airfield
San Luis, Arizona

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Yuma County Airport Authority
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Environmental Assessment

Rolle Airfield

April 2017

Version 1.0

This environmental assessment has been prepared in accordance with provisions and requirements of Title 40 Code of Federal Regulations Parts 1500 et seq. relating to the implementation of the National Environmental Policy Act of 1969.

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ACROYNMS/ABBRIEVIATIONS

AAF	Army Air Force
AAQS	Ambient air quality standards
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
ALP	Airport Layout Plan
ANPL	Arizona Native Plant Law
APE	Area of Potential Effect
APPP	Arizona Pavement Preservation Program
ARHP	Arizona Register of Historic Places
ASM	Arizona State Museum
AUX 4	Auxiliary Airfield No. 4
AZHGIS	Arizona Heritage Geographic Information System
BMGR	Barry M. Goldwater Range
BMPs	Best management practices
BOR	Bureau of Reclamation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
CO_{2e}	Carbon dioxide equivalent
DWG	Dual-wheel gear
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FBO	Fixed-base operator
FTHL	Flat-tailed horned lizard
GA	General aviation
GHGs	Greenhouse gases
GPS	Global Positioning System
GWP	Global warming potential
HDMS	Heritage Data Management System
IPaC	Information for Planning and Conservation
IPCC	Intergovernmental Panel on Climate Change
ITAs	Indian Trust Assets
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MSL	Mean Sea Level

N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAVAIDs	Navigational aids
NEAP	National Events Action Plan
NEPA	National Environmental Policy Act
NEP	Non-essential experimental population
NO_2	Nitrogen dioxide
No_x	Nitrogen oxides
NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Administration
PAC	Planning Advisory Committee
PAPI	Precision Approach Path Indicators
Pb	Lead
PLO	Petroleum, lubricants, and oils
PM	Particulate matter
PM_{10}	Particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	Particulate matter equal to or less than 2.5 microns in diameter
PRPU	Protection and Regulatory Pumping Unit
ROW	[Need definition]
SCAQMD	South Coast Air Quality Management District
SGCN	Species of greatest conservation need
SHPO	State Historic Preservation Office/Officer
SIP	State implementation plan
SO_2	Sulfur dioxide
SWAP	State Wildlife Action Plan
SWG	Single-wheel gear
TDG	Taxiway Design Group
U.S.	United States
UAS	Unmanned Aircraft System
USFWS	U.S. Fish and Wildlife Service
VOCs	Volatile organic compounds
WRAP	Western Regional Air Partnership
WWII	World War II
YCAA	Yuma County Airport Authority

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Chapter 1 Introduction

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the United States (U.S.) Department of the Interior's Bureau of Reclamation (Reclamation) guidelines. It summarizes the potential environmental effects of implementing the projects identified in the Final Rolle Airfield Airport Master Plan (Master Plan), dated May 2015 and the approved Airport Layout Plan (ALP). The Yuma County Airport Authority (YCAA) plans to improve and enhance the existing airport over the 20-year planning period as described in the Master Plan.

The YCAA currently manages, on behalf of the County of Yuma, a contract and license agreement with the Bureau of Reclamation (BOR) to operate and maintain the 640-acre Airport. The Airport is a general aviation airport located approximately 12 miles southwest of the City of Yuma, Arizona. The Airport supports general aviation users in Yuma County and the customers of Yuma International Airport's aerospace industrial base, which supports government, civilian and military operations. Yuma International Airport and Rolle Airfield (Airport) are both managed by the Airport Director with guidance of an 11-member Board of Directors.

Rolle Airfield lies within Bureau of Reclamation land commonly referred to as "5-Mile Zone Protection and Regulatory Pumping Unit (PRPU)". The 5-mile zone is a 5-mile-wide, 13-mile-long strip of land about 10 miles south of Yuma, Arizona in the extreme southwestern part of the State.

Because the Airport is located on Reclamation-managed land it is subject to review and determination under NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500 et seq.) and Reclamation's NEPA Handbook (Reclamation February 2012). Reclamation is considering the issuance of a license to operate and maintain an airport on the following-described lands of the United States in the County of Yuma, State of Arizona:

- Section thirty-five (35), Township ten (10) South, Range twenty-four (24) West, Gila and Salt River Meridian, Arizona.

This EA describes the Proposed Action, alternatives to the Proposed Action, and potential impacts related to implementation of the Proposed Action. In addition, it sets forth the consultation and public involvement process used in the preparation of this EA.

Throughout this EA, the term "project limits" is used to represent the construction footprint (area of disturbance), while the term "project area" also includes surrounding land outside of but adjacent to the project limits. The term "project study area" encompasses both the project limits and project area. The term "project vicinity" is used to denote a more expansive landscape context.

1.1 Need for the Proposed Action

The YCAA's Proposed Action is needed to renew the contract and license agreement with BOR to operate and maintain the Airport. The Proposed Action is not seeking environmental clearance for the development of the Airport as depicted in the Master Plan. All of the proposed projects identified in the Master Plan will have separate environmental clearance documentation prepared sometime in the future.

As part of the planning process the Authority developed a vision and goals for the Rolle Airfield. The Master Plan includes the following objectives:

- Develop a plan that preserves public and private investments
- Develop a plan that is reflective of community goals and objective
- Develop a plan that takes advantage of the current trends in the aviation industry toward Unmanned Aircraft Systems (UAS)
- Develop a plan that maintains safety
- Develop a plan that preserves the environment
- Develop a plan that strengthens the economy

To achieve the objectives established in the Master Plan several projects are proposed to be constructed over the 20-year planning period. The planned projects include constructing additional airfield pavement, lighting, navigational aids, fencing and construction of hangars and other associated support facilities. In addition, land acquisition is recommended to allow for the extension of the existing runway.

The City of San Luis city council adopted its General Plan 2020 in July 2011 as an update to the 2001 plan. The growth and development of Rolle Airfield is strongly supported throughout the San Luis General Plan. In part, the plan states:

> *Rolle Airfield is positioned to service the expanding economies of southwestern Yuma County. The projected continuation of exploding economic and population growth for San Luis should increase demand for general aviation facilities in southwestern Yuma County.*

The Master Plan concluded with specific recommendations for development over the planning period. As a result of the planning process the planned development projects at the Airport are as follows:

Runway and Taxiway Improvements

- Extension of Runway 17-35 to 4,520 feet;
- Construction of a full-length 35-foot wide parallel taxiway and connecting exit taxiways;
- Install an airport rotating beacon;
- Install medium intensity runway lights (MIRL), runway threshold lights, and precision approach Path indicators (PAPI-2s) on Runway 17-35;
- Reapply basic centerline and runway designation markings and holding positions;
- Apply centerline and edge markings to full length parallel taxiway;
- Install medium intensity taxiway lights (MITLs) on parallel taxiway and exit taxiways;
- Implement GPS approach to Runway 17; and
- Install lighted supplemental wind cones near extended ends of Runway 17-35.

Apron and Terminal Area Improvements

- Expand aircraft parking apron, add conventional hangars, T-hangar positions, and aircraft tie-down positions;
- Reserve space for a general aviation / terminal facility site; and
- Reserve airport property parcels for future aviation related and non-aviation related land uses.

Easements

- Obtain easements to ensure positive control of the RPZs consistent with FAA recommendations.

Other Improvements

- Construct (onsite) airfield access roads;
- Reserve area for future fueling facility; and
- Extend existing airfield security/perimeter fencing to enclose future UAS development.

1.2 Purpose of the Proposed Action

The purpose of the Proposed Action is to renew the contract and license agreement between the BOR and YCAA. The discussion on future proposed development of Rolle Airfield as determined by the 2015 Airport Master Plan is provided as justification for the contract renewal as part of the YCAA's responsibility to maintain and operate the Airport.

This EA provides information needed by the responsible federal official to determine whether to prepare a finding of no significant impact or prepare a more detailed environmental impact statement.

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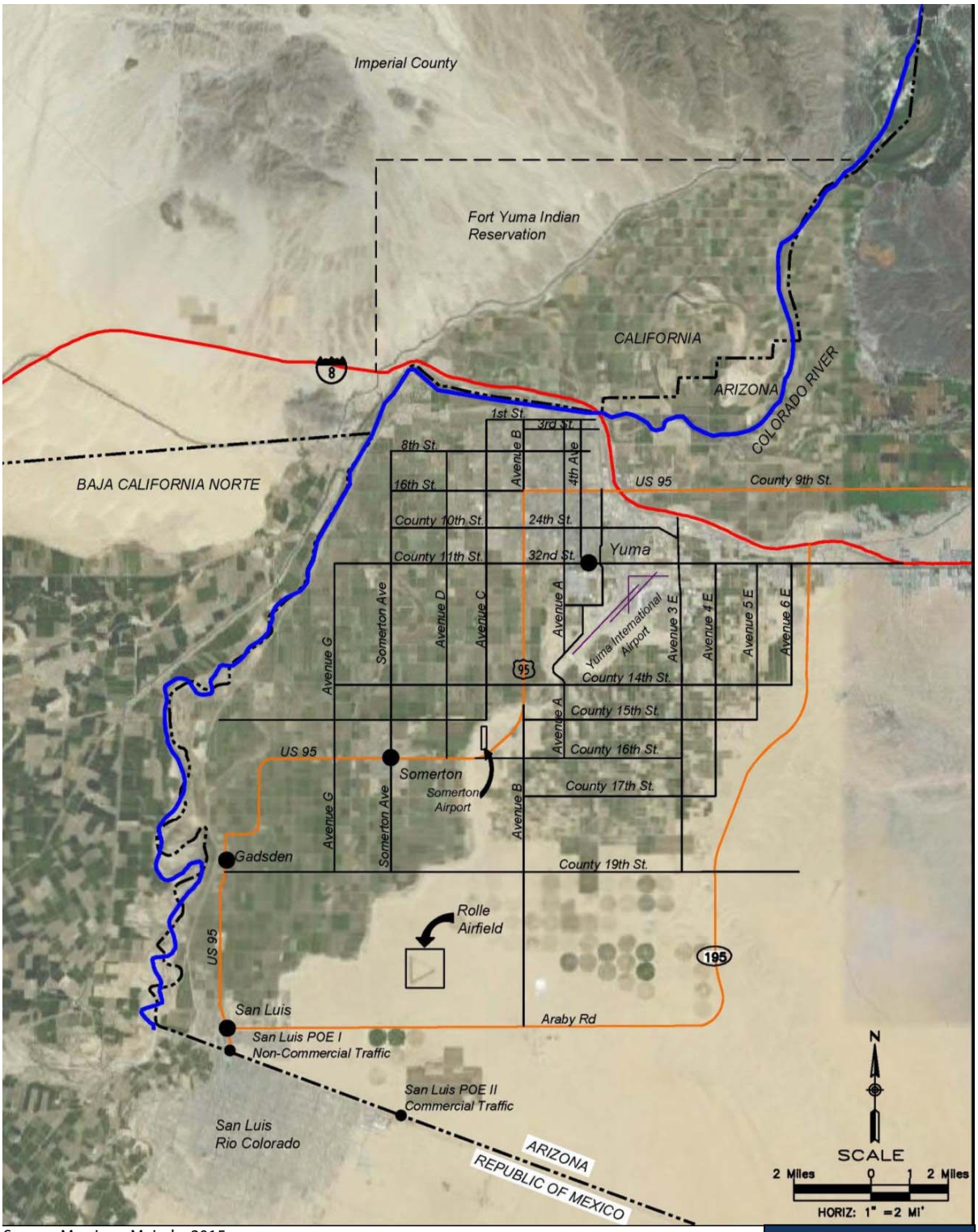
Chapter 2 Description of the Proposed Action and Alternatives

2.1 History and Location

Rolle Airfield has been serving general aviation in Yuma County for over 60 years. Originally designated as Auxiliary Airfield No. 4 (AUX 4), the 640-acre site was acquired by the War Department in 1942 (according to a 1991 Army Corps of Engineers report) to build one of seven satellite airfields for the Army Air Force (AAF), which conducted primary flight training & training of bomber aircrews. From 1942-1943, the military built two runways, a taxiway, a parking apron, and an operations building. The runways were constructed with a 2-3-inch layer of oiled sand over native sand. Rolle Airfield was declared surplus in 1945, and relinquished to the Department of Interior in 1947. On March 17, 1952, the BOR provided Yuma County a license to operate, maintain and manage Rolle Airfield. In 1966, the Yuma County Farm Bureau assumed responsibility for the Airfield since the primary beneficiaries in the area would be farmers and growers, and the related crop dusting operations. The Yuma County Airport Authority (YCAA), which was established in 1966 to administer Yuma International Airport, took responsibility of Rolle Airfield on February 24, 1972. The intent was to provide a site for civilian pilot training in the region and to reduce air traffic conflicts at Yuma International Airport/Marine Corps Air Station (MCAS) Yuma. The original agreement between the BOR and Yuma County was amended on September 17, 1973, to allow for an additional term of license and to access available State funds for capital improvements. Simultaneously, the Rolle Airfield airport license was officially delegated to the YCAA by the Yuma County Board of Supervisors. Improvements to Runway 17-35 took place in early 1976, and consisted of leveling a 50 foot by 2,500-foot area with prepared aggregate base course followed by a 2-inch asphaltic overlay and an emulsion seal coat. State grant funds covered approximately half of the fifty-thousand dollar project cost, and the YCAA provided the funding for the remaining cost. The runway improvement sparked an increased use of the Airfield as a reliever for student pilot training as air traffic in and around Yuma International Airport/MCAS Yuma increased. In 1986, Yuma County signed a new agreement with the BOR extending the term of license an additional 25 years. In 2009 the YCAA's license with the BOR was renewed for a period of 25 years (Morrison-Maierle, 2015).

Rolle Airfield is located in the southwestern portion of Yuma County, Arizona within the City of San Luis, Arizona. The airfield was annexed into the City of San Luis in June 1999. It lies approximately four nautical miles northeast of the center of the City of San Luis, Arizona and five nautical miles south of the City of Somerton, Arizona. U.S. Highway 95 connects both of these communities to the City of Yuma, which is located along Interstate 8, some 12 miles north of Somerton, and to San Luis Rio Colorado, Mexico, which is situated approximately six miles southwest of Rolle Airfield, across the border from San Luis, Arizona. The Airport is situated on 640 acres with relatively level terrain at an elevation of 163 feet above mean sea level (MSL), (Morrison-Maierle, 2015). The geographic location of Rolle Airfield is illustrated in **Figure 2.1**.



Source: Morrison-Maierle, 2015

Figure 2.1 Location Map

2.2 Alternatives Considered in Detail

In this portion of the EA, an evaluation of the No-Action Alternative and the Proposed Action is presented. The Master Plan considered three development alternatives and one No-action alternative. After meetings and discussions with the Planning Advisory Committee (PAC) established for the Master Plan project, and the Yuma County Airport Authority, as well as the public, a recommended concept evolved that included elements from all three alternatives. The recommended concept became the basis for the Airport Layout Plan.

2.2.1 No-Action Alternative

NEPA guidelines require that an EA evaluate the "no-action" alternative in addition to the Proposed Action. The No-Action Alternative provides a basis against which the environmental consequences of the Proposed Action may be compared.

In this EA, the No-Action Alternatives assumes no improvements are made at Rolle Airfield. The existing infrastructure would remain with no improvements to enhance safety and improve the capabilities of the Airport. In addition, acquisition of additional land would not occur therefore extending the existing runway would not be possible.

2.2.2 Proposed Action

The YCAA's Proposed Action is needed to renew the contract and license agreement with BOR to operate and maintain the Airport. The Proposed Action is not seeking environmental clearance for the development of the Airport as depicted in the Master Plan. All of the proposed projects identified in the Master Plan will have separate environmental clearance documentation prepared sometime in the future. The following projects are anticipated to be developed over the 20-year period.

Runway 17-35 Improvement Projects

- Overlay to 12,500 pounds single-wheel gear (SWG) loading and widen to 75 feet. (Intermediate-term Improvements)
- Construct Runway 17 Extension (860 feet) - (Intermediate-term Improvements)
- Construct Runway 35 Extension (860 feet) - (Intermediate-term Improvements)
- Overlay to 30,000 pounds dual-wheel gear (DWG) loading - (Long-term Improvements)

Description of the Runway 17-35 projects: These projects include extending the existing runway to an ultimate (long-term planning horizon) length of 4,520 feet and widening it to 75 feet. The length of 4,520 feet is the maximum runway length that will allow construction of a perimeter fence on existing airport property. The required runway safety area length beyond the end of the runway is maintained and the fence will not penetrate the 20:1 Runway Protection Zone Approach Surface. Ultimate runway pavement strength will be increased to a rating of 30,000 pounds DWG.

The runway extension can be accomplished in stages; however, it is recommended that in the short-term planning period, the minimum runway length be 3,660 feet (860-foot initial runway extension). The 3,660-foot length allows over 95 percent of the small aircraft (those weighing less than 12,500 pounds gross weight) with less than 10 passenger seats to operate without restriction at Rolle. The ultimate length of 4,520 feet will allow almost all the small aircraft with 10 or more passenger seats to operate without restriction.

Other minimum short term recommendations include widening the runway to 75 feet, and increasing the existing pavement strength rating from 8,000 pound single-wheel gear (SWG) to 12,500 pound SWG loading.

Runway 17-35 can ultimately be extended to a 5,000-foot length identified in the Airport Master Plan. Extension to the north would be preferred due to the proximity of Rolle to the Mexican border and the possible development of a clean energy tower project proposed south of Rolle Airfield along the border.

Parallel Taxiway Improvement Projects

- Construct Partial-Parallel Taxiway (A-1 to A-3) - (Intermediate-term Improvements)
- Construct Partial-Parallel Taxiway (A-3 to A-4) - (Intermediate-term Improvements)
- Overlay Parallel Taxiway to 30,000 pounds (DWG) – (Long-term Improvements)

Description of the parallel taxiway project: The long-term recommendation is for a full-length parallel taxiway and related connector taxiways to be constructed. These taxiways will be designed to Taxiway Design Group (TDG) 2 standards with regard to width and with a 300-foot separation to allow for future flexibility in aircraft design group. They will match the previously discussed runway pavement strength ratings of 12,500 pounds SWG for the short-term planning period, increasing to 30,000 pounds DWG for the long-term.

Airfield Lighting Projects

- Install Medium-Intensity Runway Lighting (MIRL) on Runway 17/35; Construct an electrical vault and extend electrical service to the airport. – (Short-term)
- Install airport beacon, lighted wind cone, and relocate segmented circle – (Intermediate-term)
- Install Medium-Intensity Taxiway Lighting (MITL) on taxiways – (Long-term Improvements)

Description of the airfield lighting projects: The installation of radio-controlled MIRL, along with runway threshold lighting on Runway 17-35, will permit 24-hour operations. Initially, taxiways can be served by taxiway retro-reflectors. Initial development will require the establishment of an airport electrical vault sized to accommodate current and future runway, taxiway, and navigational aids (NAVAIDs) electrical requirements, and the installation of MIRL for the full-length of the existing runway. Long-term recommendations include MITL for the proposed full-length parallel taxiway. An airport rotating beacon will be installed at or near the proposed terminal area in order to identify a lighted airport and to facilitate nighttime operations.

Visual Approach Aids Project:

- Install a two-box precision approach path indicator (PAPI-2) on Runway 17-35 – (Intermediate-term Improvements)

Description of the visual approach aids project: Install PAPI-2 at each end of Runway 17-35 to increase visual navigational aid to pilots.

Aircraft Parking Apron/Tie-down Area Projects:

- Construct and expand approximately 1,000-square yards of apron – (Short-term Improvements)
- Construct and expand approximately 1,000-square yards of apron – (Intermediate-term Improvements)

Description of the aircraft parking apron/tie-down area projects: These projects include expanding the apron and tie-down area at the north runway end. Tie-down positions are to be provided on the south side of the apron for both local and transient aircraft. Initial expansion may also be used to facilitate small unmanned aerial systems (UAS) operations and UAS testing. As warranted, pavement strengths are to accommodate 12,500 pounds SWG initially with potential future overlays to 30,000 pounds DWG.

Aircraft Storage Hangar Facility Projects:

- Construct conventional hangars and expand airport sanitary system - (Short-term Improvements)
- Construct two conventional hangars - (Intermediate-term Improvements)
- Construct 10 T-hangars - (Intermediate-term Improvements)
- Construct three conventional hangars – (Long-term Improvements)

Description of the aircraft storage hangar facility projects: Ultimately construct a 10-unit T-hangar facility and nine (9) conventional hangars on the southerly end of the proposed aircraft parking apron. Areas on the eastern edge of the aircraft parking apron should be reserved for future conventional hangars or a fixed-base operator (FBO) site. Hangars should be sized to accommodate anticipated aircraft types.

General Aviation Terminal Facility Project:

- Construct general aviation terminal facility (3,000 square feet) – (Long-term Improvements)

Description of the overall General Aviation (GA) terminal facility site project: Reserve sufficient space for GA terminal facility site (to accommodate 3,000 square-foot building) on the edge of the auto parking area. Configuration of the terminal facility will be determined based on anticipated function and need from the long-term planning horizon.

Airport Access Roads and Vehicle Parking Projects:

- Upgrade airport access road (all-weather gravel) from Avenue B. - (Intermediate-term Improvements)
- Pave airport access road (on-airport only) – (Long-term Improvements)

Description of the airport access roads and vehicle parking projects: Construct an airfield access road providing access to the vehicle parking area constructed adjacent to the reserved GA terminal facility site. Initial construction will be all-weather gravel and sub-grade capable of being graded and leveled periodically. Ultimate construction will include paving the access road compliant with local roadway standards.

Airport Perimeter Fencing Projects:

- Extend airport perimeter fencing – (Intermediate-term Improvements)
- Extend airport perimeter fencing – (Long-term Improvements)

Description of the overall airfield perimeter fencing projects: Extend the existing perimeter fencing to enclose the airfield in conjunction with runway extensions and construction of UAS facilities. Fencing will be comprised of 8-foot, chain-link security fence, or appropriate height "game fencing" depending on location, as dictated by FAA regulations.

Fuel Facility Project:

- Construct new fuel facility - (Long-term Improvements)

Description of the fuel facility project: Reserve a site for future fuel facility construction along the northern edge of proposed aircraft parking apron. The fuel facility may include individual double walled surface (skid) tanks and associated containment areas for dispensing 100 LL AvGas or Jet-A aviation fuels, and will be compliant will all Federal EPA and State DEQ regulations.

Fire Suppression System Project:

- Install fire suppression system – (Short-term Improvements)

Description of the fire suppression system project: Installation of a fire suppression system and hydrant tie-in with commercial water supply or local well systems is proposed. The capacity of the overall system must be capable of supplying water to required hangar fire suppression systems as well as required hydrant systems throughout the airport.

Airport Pavement Preservation Program Projects:

- Seal affected pavements through ADOT's Airport Pavement Preservation Program. (APPP) – (Intermediate-term)
- Seal affected pavements through ADOT's Airport Pavement Preservation Program (APPP). – (Long-term)

Description of the airport pavement preservation program projects: Under the ADOT APPP perform asphalt sealing, overlay, and crack-sealing as appropriate on eligible airport runway, taxiway, and apron areas.

Establish Fiber Optics/Telecommunications to Airport Projects:

- Establish fiber optics/telecommunication links between Rolle Airfield and Yuma International Airport – (Short-term Improvements)

Description of the telecommunications project: Establish fiber optic/telecommunications links from Rolle Airfield to Yuma International Airport as necessary to link Air Traffic Control, and commercially link high-speed communications between the two facilities. Communication links may consist of direct fiber/wire connections, or combination of direct wire and radio broadcast (microwave) links.

Upgrade and Reconfigure Helicopter Landing Area Project:

- Upgrade and reconfigure the existing helicopter landing area to current FAA standards – (Intermediate-term)

Description of helicopter landing area project: Reconfigure, remark, and potentially relocate current helicopter landing area to meet current FAA standards.

Construct UAS Launch/Recovery Site Project:

- Develop and construct a UAS launch/recovery site – (Long-term Improvements)

Description of the UAS development site: Configure and construct a UAS launch and recovery site to include staging areas, shade-hangars, parking locations, electrical utilities, command and control facilities, and launch and recovery areas or runways as appropriate to the designated UAS mission.

Establish GPS Approach Procedure Project:

- Establish GPS non-precision approach procedure to Runway 17 or 35 – (Long-term Improvements)

Description of the GPS procedure approach project: Coordinate with the FAA and Yuma International Airport for airspace requirements and development requirements for a new GPS non-precision approach procedure for either Runway 17 or 35 to accommodate instrument air traffic utilizing Rolle Airfield.

2.3 Conclusion

Through the alternatives development and public involvement processes, the Proposed Action and the No-Action Alternative were identified as viable alternatives and carried forward for further study. The Affected Environment and Environmental Consequences chapter contains a discussion of how the Proposed Action and the No-Action Alternative will affect the environmental resources in the project area.

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Chapter 3 Affected Environment and Environmental Consequences

To comply with Council on Environmental Quality requirements for analytical and concise environmental documents (40 CFR 1502.2), resources that may be affected by the Proposed Action or that are considered a special concern are described in this part of the EA. An environmental effect, or impact, is defined as any change or alteration to the preexisting condition of the environment produced directly or indirectly by the Proposed Action.

This EA evaluated the resource elements below in relation to the Proposed Project to determine the potential for both adverse and beneficial effects. Only the elements of the environment that could be affected by the Proposed Project would be discussed in detail.

Evaluated Resources:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural/Historic Resources
- Geology and Soils
- Hazardous and Solid Waste
- Water Resources
- Land Use/Ownership
- Noise
- Indian Trusts Assets
- Socioeconomics
- Environmental Justice

3.1 Aesthetics

This section addresses visual resources potentially affected by the Proposed Action. It provides inventories of visual resources in the vicinity and the project study area, including the project scenery or setting, affected sensitive visual resource viewers, and an analysis of the City of San Luis's planning goals and objectives. Due to the close proximity of the City of Yuma to the Airport, the City of Yuma's planning objectives were also considered within this section. Included are proposed management and mitigation measures and/or best management practices (BMPs), that would minimize impacts to visual resources.

3.1.1 Affected Environment

The project vicinity of the Proposed Action is located within the Basin and Range Physiographic Province in southwest Arizona. The Basin and Range Province is distinguished by isolated, roughly parallel mountain ranges separated by closed desert basins. The local topography of the project area is characterized by sloping plains and broad, flat valleys, with distant mountains in the background. The predominant vegetation character of the study area is representative of the Lower Colorado River Valley subdivision.

Creosote and white bursage are dominant plant species on undeveloped lands and are characterized by a sparse, open shrub canopy that is low to the ground. Developed areas typically consist of low-density residential lots intermixed with native vegetation. Agricultural areas are primarily citrus and alfalfa (EPG, 2007).

There are no formally designated or defined trails, parks, or trailheads within the project study area. There are no other recreational resources in the project study area. The closest national park resource is the Organ Pipe Cactus National Monument located in Ajo, Arizona, which is more than 200 miles east of the Airport (U.S. Department of the Interior , 2016).

Due to the remote location of Rolle Airfield, viewers would not be affected by the development of the Airport. The surrounding terrain in the vicinity of the Airport is entirely flat landscape. The closest residents are more than two and a half miles west and more than two miles south of the Airport.

3.1.2 Environmental Consequences/Impacts

3.1.2-1 No Action

With implementation of the No-Action Alternative, no visual resources would be modified or influenced by the Proposed Action; therefore, no impacts to visual resources would result from this alternative.

3.1.2-2 Proposed Action

Introduction of the Proposed Project would have minimal impacts on the existing landscape setting. During construction, the Proposed Action could negatively affect the visual quality of the project area. Dust and exhaust from equipment would temporarily lower visibility as a result of some of the projects within the project limits, but this condition would end with the completion of construction.

The only vertical structures proposed at the Airport will be single story buildings. The rest of the development will primarily consist of additional pavement, elevated airfield lighting and fencing all of which will not be seen from a distance. Viewers should not be affected by the proposed development at the Airport. Low impacts to visual resources are anticipated to occur in the project area.

3.1.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate impacts to visual resources:

- Construction and maintenance traffic will utilize existing access roads, where feasible, to minimize new disturbance.
- Alignment of the new access road will follow the landform contours where practicable, providing that such alignment does not impact additional visual resources.

3.1.4 Best Management Practices

There are no best management practices proposed.

3.2 Air Quality

Air quality and climate are components of air resources which may be affected by the Proposed Action. Emissions of air pollutants would occur during construction activities and during operations. Emissions from construction activities include fugitive dust from general construction activity and exhaust emissions from construction equipment and worker commuting. Emissions during the construction phase would be temporary and transient as the various phases of the construction activities progress. During the operational phase, emissions would include both military and civilian aircraft and anticipated unmanned aircraft systems (UAS) operating at the Rolle Airfield.

3.2.1 Affected Environment

This section, collectively regarded as the affected environment, discusses the law and regulatory requirements and existing air quality in the Proposed Project area. Existing conditions of the Project area, including regional climate, ambient air quality standards, attainment status, and existing ambient air quality, are described in this section.

Regional Climate

The Proposed Action is located in San Luis, Yuma County, Arizona approximately 10 miles south of Yuma, Arizona. This area can be characterized as a subtopic hot desert type of climate. Yuma's average annual rainfall is around three inches per year, and humidity is generally low, ranging from 10% to 60%, except during the summer monsoon season. Prevailing winds are most often out of the south (U.S. Climate Data, 2016). Additional details with regards to the regional climate of the study area are also provided in section 3.3, Biological Resources.

Ambient Air Quality Standards

Under the Clean Air Act (CAA), the EPA has the authority to regulate emissions from both stationary and mobile sources. The CAA requires the EPA to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA established NAAQS for six common, principal pollutants ("criteria" pollutants). The criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), lead (Pb), and particulate matter (PM), including PM equal to or less than 10 microns in diameter (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$).

The NAAQS include primary standards that provide for the protection of human health, and secondary standards that provide for the protection of public welfare (e.g. visibility, the health of vegetation and animals). The NAAQS are defined in terms of threshold ambient concentrations measured as an average for specified periods of time. Pollutants with acute health effects are assigned short-term standards and those with chronic health effects are assigned long-term standards. The NAAQS undergo periodic revisions to ensure that emerging science and technology result in the most up-to-date and protective standards achievable.

On October 1, 2015, the EPA strengthened the NAAQS for O_3. Based on its review of the air quality criteria for O_3 and related precursors, the EPA is revising primary and secondary NAAQS for O_3. The EPA is revising the levels of both standards to 0.070 parts per million (ppm) for an 8-hour averaging time. The final rule is effective December 28, 2015. As summary of the current NAAQS is provided in **Table 3.1.**

Under the provisions of the CAA, states can elect to develop their own ambient air quality standards (AAQS) that are more stringent than the NAAQS; however, the Arizona Department of Environmental Quality (ADEQ) has adopted and enforces the NAAQS at the state level.

Table 3.1 National Ambient Air Quality Standards

POLLUTANT	AVERAGING TIME	PRIMARY STANDARD	SECONDAY STANDARD	FORM
CO	1-hour	35 ppm	-	Not to be exceeded more than once per year
	8-hour	9 ppm	-	Not to be exceeded more than once per year
NO_2	1-hour	100 ppb	-	98th percentile, averaged over 3 years
	Annual	53 ppb	53 ppb	Annual mean
SO_2	1-hour	75 ppb	-	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	3-hour	-	0.5 ppm	Not to be exceeded more than once per year
O_3	8-hour	0.070 ppm	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
PM_{10}	24-hour	150 µg/m^3	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	24-hour	35 µg/m^3	35 µg/m^3	98th percentile, averaged over 3 years
	Annual	12 µg/m^3	15 µg/m^3	Annual mean, averaged over 3 years
Pb	3-month	0.15 µg/m^3	0.15 µg/m^3	Not to be exceeded

Abbreviations: ppm: parts per million; ppb: parts per billion; µg/m3: micrograms per cubic meter
Source: (U.S. Environmental Protection Agency, 2016a)

Attainment Status

The EPA assigns classifications to geographic areas based on monitored ambient air quality conditions. Areas that meet both the primary and secondary standards of a pollutant subject to NAAQS are classified as being in attainment for that pollutant. Areas that do not meet the NAAQS for a pollutant are designated as being in nonattainment for that pollutant. Areas that cannot be classified based on available information for a pollutant are designated as being unclassified. An area's attainment status is designated separately for each criteria pollutant; one area may have all three classifications. Previously designated nonattainment areas for one of the NAAQS that have since met the NAAQS standards are referred to as attainment areas with a maintenance plan. To ensure that the air quality in those areas continues to meet the standards, a maintenance plan is developed and implemented.

The EPA designates Yuma County as an area which currently meets the thresholds for all criteria pollutants except for PM_{10}. Parts of the county were designated as moderate PM_{10} nonattainment areas under the 1990 Clean Air Act amendments. The Arizona Department of Environmental Quality (ADEQ) submitted the Yuma PM_{10} Maintenance Plan to the EPA. The Proposed Action is within the PM_{10} nonattainment area for Yuma County.

Due to the Yuma area 24-hour PM_{10} NAAQS violations in 1990 and 1991, and previously in 1989 and 1990, the ADEQ completed a state implementation plan (SIP) for the Yuma moderate PM_{10} nonattainment

area in 1991. Contributing PM_{10} emission sources in the Yuma area, including the city of Yuma, Yuma County, and the city of Somerton, are agricultural activities, paved and unpaved road dust, and disturbed areas.

The ADEQ website (www.azdeq.gov) states the current status of the nonattainment area as the following:

> Yuma was designated a moderate PM_{10} nonattainment area by operation of law in the 1990 CAA. An SIP revision was submitted in 1991, and a supplement was submitted in 1994 adopting a range of PM_{10} control measures and demonstrating attainment with the NAAQS. The EPA took no action on these plans. An exceedance of the PM_{10} standard occurred on August 18, 2002, which was flagged as a natural exceptional event. ADEQ developed and submitted a Natural Events Action Plan (NEAP) to the EPA on February 17, 2004, pursuant to the EPA's Natural Events Policy, in effect at that time, and submitted a NEAP Implementation Report to the EPA February 17, 2005 with a maintenance plan due 18 months thereafter. In compliance with this requirement, ADEQ developed and submitted the Yuma PM_{10} Maintenance Plan to the EPA. Exceptional Event Rule documentation for 2008 and 2009 exceedances is in development.

ADEQ submitted a maintenance plan for the Yuma area to the EPA on August 16, 2006, which, upon the EPA's approval, will re-designate the area. According to ADEQ webpage, the current status is pending EPA approval.

Applicable Air Quality Regulations

Since 1963, the CAA and subsequent amendments in 1970, 1977, and 1990 have provided the authority and framework for the EPA regulation of air emission sources. Regulations have been promulgated pursuant to the CAA to serve as requirements for the monitoring, control, and documentation of activities that will affect ambient concentrations of pollutants that may endanger public health or welfare.

Applicable air regulations, including the General Conformity Rule, and an overview of applicable state and county-level air quality rules and ordinances, are discussed in this section.

General Conformity

The General Conformity Rule was established under CAA Section 176(c)(4) and serves to ensure that federal actions do not inhibit states' attainment plans for areas designated as nonattainment or maintenance. The project is considered a federal action since a Federal agency (i.e., BOR) will be licensing, permitting, or otherwise approving portions of the project. The term conformity (as it pertains to the rule), means "conformity to a State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards." The rule effectively applies to all federal actions that take place in areas designated as nonattainment or maintenance, except for actions covered under the transportation conformity rule, actions with associated emissions below specified de minimis levels, and other actions that are exempt or presumed to conform. The Project is located in a nonattainment area for PM_{10} and, therefore, emissions from the Project are subject to General Conformity and must conform to the SIP.

De minimis levels for criteria pollutants are established under the General Conformity Rule in 40 CFR 93.153. De minimis levels are based on the severity of an area's air quality problem and establishes a

threshold for determining if a General Conformity determination must be performed. Activities below this threshold level are assumed to have no significant impact on air quality and the activity is exempt. The General Conformity Rule establishes more restrictive de minimis emission levels for certain nonattainment and maintenance areas in ozone transport regions. De minimis emission rates for all PM_{10} moderate nonattainment and maintenance areas is 100 tons per year (U.S. Enviromental Protection Agency, 2016b). A General Conformity applicability analysis is provided in Section 3.2.2.

Applicable State Requirements

The construction activities associated with the Project will occur in Yuma County, Arizona. These activities are governed by the applicable rules and regulations promulgated by the ADEQ (which includes Yuma County). **Table 3.2** provides a summary of the applicable ADEQ, and Yuma County, fugitive dust rules, regulations, and ordinances with which the Project must comply.

Air permitting is not anticipated to be required as there are no aboveground stationary sources proposed for this Project. The following briefly discusses a subset of these requirements that have been evaluated for applicability to the Project.

Table 3.2 Applicable Fugitive Dust Rules

AGENCY	RULE NUMBER	RULE DESCRIPTION
ADEQ	R18-2-604	Construction on "open areas'" fugitive dust limitations
ADEQ	R18-2-605	Road construction fugitive dust limitations
ADEQ	R18-2-606	Material handling fugitive dust limitations
ADEQ	R18-2-607	Storage pile fugitive dust limitations
ADEQ	R18-2-614	Opacity limitation for non-point sources
ADEQ	R18-2-702	Visible emission limitations
ADEQ	R18-2-802	Off-road machinery opacity limitations
ADEQ	R18-2-805	Roadway and site clearing opacity limitations
Yuma County	Ordinance 05-01	Requires project information signage for construction activities within the Yuma PM_{10} nonattainment area

Source: (SWCA Environmental Consultants, 2016)

The following subsections provide a brief overview of the applicable fugitive dust rules, regulations, and ordinances applicable to the Project.

Arizona Department of Environmental Quality Rules

The Arizona Administrative Code Title 18, Environmental Quality, Chapter 2, Department of Environmental Quality, Air Pollution Control, Section R18-2-614, effective July 18, 2005, prohibits visible dust emissions with opacity greater than 40 percent from any non-point source measured in accordance

with the Arizona Testing Manual, Reference Method 9. Reference Method 9 involves the determination of plume opacity by qualified observers. The method includes procedures for the training and certification of observers, as well as procedures to be used in the field for determination of plume opacity (State of Arizona, 2013).

These rules also require control of visible dust from open areas, road construction, material handling, storage piles, roadway, and site clearing.

Yuma County Board of Supervisors

Yuma County Ordinance 05-01 applies to areas of the Project that occur within the designated PM_{10} nonattainment area within Yuma County. Pursuant to the Yuma County Ordinance 05-01, project construction signage must be posted prior to beginning actual construction activities within the Yuma County PM_{10} nonattainment area. The ordinance requires one sign be posted prior to the beginning of actual construction activities at the relevant (within the Yuma County PM_{10} nonattainment area) main construction entrance to the ROW (Yuma County Board of Supervisors, 2005).

Existing Air Quality

A representative background air quality monitor, the Yuma Supersite Monitoring Station, is located approximately 13 miles northeast of the Project site. Due to its proximity to the Proposed Project, the data from the Yuma Supersite Monitoring Station, located at 2323 S. Arizona Ave., Yuma, Arizona, 85365, was used for the following criteria pollutants: O_3, $PM_{2.5}$, and PM_{10}. The data collected at this monitoring station is representative of the air quality experienced on site from 2013 through 2015 and is shown in **Table 3.3**. The Yuma Supersite Monitoring Station does not monitor for lead, SO_2, CO, or NO_2. The closest monitoring station that monitors SO_2, CO, and NO_2 is the Alamo Lake Monitoring Station in the Alamo Lake State Park on Cholla Road in Wendon, Arizona. This station is 135 miles from the Project location and is too far to be representative of background pollutant concentrations for the Project area.

Table 3.3 Local Air Quality Levels (2013-2015)

POLLUTANT	FEDERAL PRIMARY STANDARD	YEAR	CONCENTRATION
1-Hour Ozone (O_3) [1]	NA	2013	0.083 ppm
		2014	0.089 ppm
		2015	0.086 ppm
8-Hour Ozone (O_3) [1]	0.070 ppm	2013	0.074 ppm
		2014	0.084 ppm
		2015	0.078 ppm
24-Hour Fine Particulate Matter ($PM_{2.5}$) [2]	35 µg/m^3	2013	15.7 µg/m3
		2014	22.9 µg/m3
		2015	14.2 µg/m3
Annual Average $PM_{2.5}$ [3]	12 µg/m^3	2013	-
		2014	6.3 µg/m3
		2015	-
24-Hour Particulate Matter (PM_{10}) [4]	150 µg/m^3	2013	228 µg/m3
		2014	375 µg/m3
		2015	165 µg/m3
Annual Average PM_{10} [5]	NA	2013	41.06 µg/m3
		2014	45.47 µg/m3
		2015	36.51 µg/m^3

Abbreviations: µg/m^3 = micrograms per cubic meter; ppm = parts per million; NA = not applicable (no defined standard)
Notes.
1: Third-highest max concentration for each year is given.
2: 98th percentile for each year is given.
3: Weighted annual mean is given. The data was incomplete for 2013 and 2015.
4: Second-highest max concentration for each year is given.
5: Annual mean is given.
Source: (U.S. Environmental Protection Agency, 2016a); (Arizona Department of Environmental Quality [ADEQ], 2016)
Data is from Yuma Supersite monitor in Yuma, AZ for the years 2013-2015.

Emission inventories are useful in comparing emission source categories to determine which industries or practices are contributing to the general level of pollution in an area. Emission inventories provide an overview of the type and amount of pollution emitted on an annual basis from sources in the area. For the purposes of this assessment, the most recent National Emissions Inventory conducted in 2011 was summarized for Yuma County. The emission inventory data is presented in **Table 3.4**.

Table 3.4 Emission Inventory in Tons per Year for Yuma County

SOURCE	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	HAPS	CO_2	CH_4	N_2O	MT CO_2E [3]
Yuma County											
Agriculture	0	0	1,353	271	0	0	0	0	0	0	0
Biogenics[1]	29,683	1,149	0	0	0	140,463	25,892	0	0	0	0
Dust	0	0	6,806	762	0	0	0	0	0	0	0
Fires	3,005	94	346	278	37	550	119	34,820	101	0	33,875
Fuel Combustion	491	269	78	73	7	99	15	0	0	0	0
Industrial Processes	0	0	192	26	0	37	2	0	0	0	0
Miscellaneous[2]	18	1	48	44	0	2,394	374	0	0	0	0
Mobile	32,100	6,853	379	273	42	4,030	1,002	1,089,732	64	56	1,005,081
Waste Disposal	0	0	21	7	0	33	12	0	0	0	0
Total Emissions	**65,297**	**8,366**	**9,223**	**1,733**	**86**	**147,606**	**27,416**	**1,124,552**	**165**	**56**	**1,038,957**

Notes.
1: Biogenic emissions are those emissions derived from natural processes (such as vegetation and soil).
2: Miscellaneous categories include bulk gasoline terminals, commercial cooking, gas stations, miscellaneous non-industrial (not elsewhere classified), and solvent use.
3: CO_2e (CO_2 equivalent) assumes a USEPA recommended global warming potential of 25 for methane (CH_4) and 298 for nitrous oxide (N_20) and is in metric tons per year.
Source: (U.S. Environmental Protection Agency, 2016c)

According to the 2011 National Emissions Inventory, the major pollutants emitted in Yuma County are greenhouse gases (GHGs), volatile organic compounds (VOCs), and CO. The major source contributing to VOC emissions is biogenics. Fires and mobile sources are the major contributors to GHGs. The major sources contributing to CO emissions are biogenics and mobile sources. PM_{10} emissions are principally generated from dust and agriculture; $PM_{2.5}$ emissions are primarily attributable to dust, fires, agriculture, and mobile sources. Mobile sources and biogenics are the major contributors to nitrogen oxides (NO_X) emissions in the county. SO_2 emissions are mostly generated in Yuma County through fires and mobile sources.

Global Climate Change

The 2013 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report states that the atmospheric concentrations of well-mixed, long-lived GHGs, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), have increased to levels unprecedented in at least the last 800,000 years. Further human influence has been detected in warming of the atmosphere and the ocean, changes in the global water cycle, reductions in snow and ice, global mean sea level rise, and changes in some climate extremes. It is extremely likely (95%–100% probability) that human influence has been the dominant cause of the observed warming since the mid-twentieth century (IPCC Working Group I , 2016).

Global mean surface temperatures have already increased 1.5°F (from 1880 to 2012). Additional near-term warming is inevitable due to the thermal inertia of the oceans and ongoing GHG emissions. However, climate change will impact regions differently and warming will not be equally distributed. Both observations and computer model predictions indicate that increases in temperature are likely to be greater

at higher latitudes, where the temperature increase may be more than double the global average. Models also predict increases in duration, intensity, and extent of extreme weather events. Warming of surface air temperature over land will very likely be greater than over oceans (IPCC Working Group I , 2016).

Per EPA rule, GHG emissions are quantified in carbon dioxide equivalent (CO_2e). CO_2e is calculated using an EPA-defined formula that assigns a global warming potential (GWP) to GHGs. The GWP has been calculated to reflect how long a GHG compound remains in the atmosphere, on average, and how well it absorbs energy. Gases with a higher GWP absorb more energy per pound than gases with a lower GWP, contributing more to warming. For example, methane has a GWP of 25, so 1 ton of CH_4 emissions is equal to 25 tons CO_2e. This method allows all GHG compounds to be considered together (U.S. Government Publishing Office, 2016).

The Council on Environmental Quality (CEQ) final GHG guidance states that agencies should consider the potential effects of a proposed action on climate change by assessing GHG emissions. Agencies should also consider the effects of climate change on the proposed action and its environmental impacts (Council on Environmental Quality, 2016).

3.2.2 Environmental Consequences

Determination of the need for an air quality analysis is based on the ultimate forecast level of operations. FAA Order 5050.4B, Paragraph (e)(5) states that "certain airports must comply with federal and state regulations, which set air quality standards for certain airborne pollutants including ozone, carbon monoxide, nitrogen monoxide, nitrogen dioxide, sulfur dioxide, and suspended particles (2006)." The Order also states that an air quality analysis is not needed when the Proposed Project is a general aviation airport with less than 180,000 operations forecast annually. According to the 2015 Rolle Airfield Master Plan, 42,210 operations are projected in 2033 which is well below the minimum-operations threshold requiring an air quality analysis.

Yuma County is located in a nonattainment area for particulate matter PM_{10} as indicated by the EPA Green Book; therefore, a General Conformity analysis is required. However, FAA Order 1050.1F indicates if the action is below the emissions threshold (de minimis) levels, then conformity regulations do not apply. These emission thresholds are defined in the General Conformity Rule. Projects with emissions less than the de minimis levels are considered not regionally significant (Federal Aviation Administration, 2015).

3.2.2-1 No Action

Under the no action alternative, Rolle Airfield would not be expanded and there would be no additional impacts on air quality.

3.2.2-2 Proposed Action

Construction Activities

The Proposed Action includes a variety of improvements to the Rolle Airfield over the course of a 20-year timeframe. These projects have been categorized as short, intermediate, and long-term projects within the Project description and Rolle Airfield Master Plan (dated May 2015). Because construction details for the intermediate and long-term project were not available and it is unknown what the PM_{10} status of the Project area could be in the future, for the purpose of conducting a General Conformity determination, an analysis of the short-term phase has been conducted.

In the short-term, the project would temporarily increase dust caused by vehicles on dirt roads and exhaust. Earthmoving and grading activities may temporarily create a source of blowing dust on the cleared land. Air quality effects would be insignificant if emissions associated with the Proposed Action would not exceed the General Conformity Rule de minimis threshold values and would not contribute to a violation of any federal, state, or local air regulation.

Air quality impacts associated with airfield improvement construction projects generally arise from fugitive dust generation and the operation of construction equipment. Large earth-moving equipment, skid loaders, trucks, and other mobile sources may be powered by diesel or gasoline and are sources of combustion emissions, which include NO_X, CO, VOCs, PM, small amounts of SO_2, trace amounts of air toxics, and greenhouse gases.

Specifically, construction emissions will include:

- Exhaust emissions from construction vehicles and equipment;
- Exhaust emissions from transport of construction workers, equipment, and materials to the project site; and
- Fugitive dust from construction activities and wind erosion of disturbed areas.

Exhaust emissions from construction vehicles and equipment, and from transport of construction workers, equipment, and materials to the project site, were determined using South Coast Air Quality Management District's (SCAQMD) Off-Road Model Mobile Source Emission Factors for the 2016 vehicle fleet. Average emission factors for construction vehicles and equipment in pounds per hour for CO, NO_X, SO_2, VOC, PM_{10}, CH_4, and CO_2 were obtained and multiplied by the quantity and duration of equipment use (South Coast Air Quality Management District, 2007b). For on-road transport of construction workers, equipment, and materials to the project site, average emission factors in pounds per vehicle mile traveled for CO, NO_X, SO_2, VOC, PM_{10}, $PM_{2.5}$, CH_4, and CO_2 were determined. All workers, vehicles, equipment, and materials were assumed to come from Yuma, AZ, approximately 16 miles away from the Project site.

Fugitive dust emissions due to general construction were estimated using methodology within the Western Regional Air Partnership (WRAP) Fugitive Dust Handbook. Fugitive emissions from construction operations and wind erosion from disturbed areas are considered. A control efficiency of 61 percent was assumed to account for water application (Countess Environmental, 2006). Fugitive dust emissions due to vehicle travel on paved and unpaved roads were estimated using emission factor calculations from the U.S. EPA's AP-42, Compilation of Air Pollutant Emission Factors, Chapters 13.2.1 and 13.2.2 (2006; 2011). Construction emissions from the Proposed Project in tons per year are presented in **Table 3.5**.

Table 3.5 Project Construction Emissions in Tons per Year

EMISSION SOURCE	EMISSIONS (TONS)							EMISSIONS, (MT)
	CO	NO_X	SO_X[1]	PM_{10}	$PM_{2.5}$	VOC	HAPS	GHG[2]
Construction Equipment (off-road)	1.43	2.32	0.00	0.11	0.10	0.33	0.03	367
Commuting	0.12	0.03	0.00	3.68	0.37	0.01	0.00	25
Equipment/Material Delivery	0.05	0.13	0.00	0.39	0.05	0.01	0.00	27
Fugitive Dust from Construction Operations	-	-	-	0.08	0.01	-	-	-
Total	**1.60**	**2.48**	**0.00**	**4.26**	**0.53**	**0.36**	**0.03**	**419**
Percent of Total Yuma County Emissions	**< 0.01%**	**0.03%**	**0.01%**	**0.05%**	**0.03%**	**< 0.01%**	**< 0.01%**	**N/A[3]**
De Minimis Threshold	**N/A**	**N/A**	**N/A**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Is Threshold Exceeded?	**N/A**	**N/A**	**N/A**	**No**	**N/A**	**N/A**	**N/A**	**N/A**

Notes:
1: All oxides of sulfur (including SO_2). For purposes of comparison, SO_2 emissions reported in the county inventory are assumed to be equal to SO_X.
2: GHG are based on the GWP of CO_2 (1) and CH_4 (25), and are reported in metric tons per year (mtpy).
3: CO_2e emissions are not reported for all sources in the county inventory. Therefore, CO_2e emissions are not compared to the county inventory.
Sources: (SWCA Environmental Consultants, 2016; South Coast Air Quality Management District, 2007a; South Coast Air Quality Management District, 2007b; Countess Environmental, 2006; U.S. Environmental Protection Agency, 2006; U.S. Environmental Protection Agency, 2011)

For purposes of analysis, it was assumed that all short-term construction activities would be compressed into an eight-month period. Therefore, regardless of the ultimate implementation schedule, annual emissions would be less than those specified herein. Small changes in the scope of the Proposed Action and moderate changes in quantity and types of equipment used would not substantially change those emission estimates and would not change the determination under the General Conformity Rule or level of effects under NEPA.

There would be no new permanent sources of air emissions associated with the Proposed Action, and air permitting requirements would not apply. However, if any new sources of air emissions were required, they could be subject to federal and state air permitting regulations, including new source review, prevention of significant deterioration, national emission standards for hazardous air pollutants, or new source performance standards. Additionally, they would be added to the facility's air permit, and both a new source construction permit and a modification to the existing construction permit could be required.

Construction emissions from the Proposed Action are below General Conformity thresholds. As stated in section 3.2.1, the Proposed Action is located in the Yuma County PM_{10} moderate nonattainment area and the appropriate de minimis threshold is 100 tons per year. PM_{10} emissions from the Proposed Project would be 4.26 tons per year. Therefore, no de minimis thresholds will be exceeded for the Proposed Project and a General Conformity determination does not need to be performed.

Construction emissions are less than the General Conformity determination thresholds for a nonattainment area. Therefore, no significant air quality impacts are anticipated with the

implementation of the Proposed Action. However, periodic review of the EPA attainment status should be conducted so that future projects are developed in a manner consistent with air quality guidelines and requirements. Depending on the future classification of the PM_{10} nonattainment area, construction impacts associated with the intermediate and long-term construction activities should be analyzed to ensure they are less than the General Conformity determination thresholds.

Operations

Potential impacts from operation and maintenance activities would be similar in nature to those currently occurring at the Rolle Airfield. As of 2015, the Rolle Airfield is used primarily for student pilot training. There are no aircraft based at the airfield. However, given the expected continuation of the economic and population expansion of the San Luis and Yuma area, it is expected that there will be increases in the number of based aircraft as well as a more varied fleet mix. Increases in the level of maximum operations is anticipated to increase by 5 percent every 5 years (Morrison-Maierle, 2015). By 2033, the Rolle Airfield Airport Master Plan expects there will be a total of 8 aircraft based at the airfield: 6 single-engine aircraft, 1 multi-engine aircraft, and 1 turbo-prop aircraft. The forecasts for the airfield predict 10,520 total annual aviation operations and 30,690 UAS operations at Rolle Airfield in 2033 (Morrison-Maierle, 2015). The aircraft engine exhaust will be the primary source of operational emissions. However, these operational levels are far below levels that would warrant a detailed air quality impacts analysis if the Project was subject to FAA review (<180,000 annual operations). Given the existing level of use of the airport, impacts to air quality would be minor in areas to be developed and adjacent areas.

While the Project is not recognized by the FAA, the FAA's *Air Quality Procedures for Civilian Airports & Air Force Bases* guidance stated that if the level of annual enplanements exceeds 1,300,000, or the level of general aviation and air taxi activity exceeds 180,000 operations per year, or a combination thereof, an air quality impact assessment should be considered. The FAA considers that airports with activity levels below these thresholds are very unlikely to have pollutant concentrations above the NAAQS, and no ambient impact assessment is required (Eberle & Steer, 1982). These FAA criteria refer to total airport activity, not the change due to the Project. The forecast activity levels for Rolle in 2033 are 42,210 total operations with no enplanement activity anticipated. Because these activity levels fall below the FAA thresholds, operations are not expected to lead to pollutant levels above the NAAQS and a quantitative impact assessment was not conducted.

Past and present actions within the cumulative impact analysis area that contribute to air quality impacts include motorized, non-motorized, and aviation travel, agriculture and cultivation, recreational use, and community development/expansion. The reasonably foreseeable future actions are expected to continue as currently with respect to these activities; however, air quality regulations have decreased impacts to air quality recently, and would be expected to continue to decrease. The development of the Proposed Action would have negligible contributions to air quality.

3.2.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate impacts to air quality:

- The amount of traffic and vehicle speeds on dirt roads would be limited during construction activities and dust would be abated by watering or another appropriate dust-abatement measure.

- Construction equipment and vehicles used during construction will be properly maintained to minimize exhaust emissions and equipment idling will be limited.
- Exposed, erodible earth will be minimized to the extent possible.
- Exposed earth will be stabilized with dust palliative, pavement, or other cover as early as possible.
- Covered haul trucks will be used.
- Stockpiled materials will be covered, shielded, or stabilized as necessary.

3.2.4 Best Management Practices

The following BMP is recommended to mitigate impacts to air quality:

- Per Yuma County Ordinance 05-01, a project information sign with a phone number for citizens to report dust complaints will be displayed.

3.3 Biological Resources

This section evaluates impacts from the Proposed Action on natural resources in the project area. Resources include plants and terrestrial and aquatic wildlife species and their habitats.

3.3.1 Affected Environment

A site visit to the proposed project area was conducted on April 7, 2016, by SWCA Environmental Consultants (SWCA) biologist Jeffery Johnson. The proposed project is located in the Lower Colorado River valley in southwestern Arizona, south of Yuma, approximately 6 miles west of the Colorado River and 3 miles north of the United States/Mexico international border (see Figure 2-1). The surrounding area consists of undeveloped, open desert with agriculture approximately 1-mile north and south of the proposed project area. The greater area has large areas of agriculture and open desert. The proposed project area has areas of undeveloped, open desert and existing airport facilities, including the runway, taxiway, and hanger. Outside the existing airport fence, the project area contains areas of undeveloped, open desert as well as areas that were previously paved and where desert vegetation has re-established in limited areas.

Climate and Vegetation

The project area and vicinity are characterized by low rainfall (3.09 inches average per year), high temperatures, and low humidity. Summer average maximum temperatures are approximately 107 degrees Fahrenheit (°F) with winter average maximum temperatures up to 80°F. Precipitation occurs primarily in the winter months (U.S. Climate Data, 2016). The project area is relatively flat and is located at approximately 165 feet above MSL.

The project area is dominated by creosote bush (*Larrea tridentata*) with low vegetative cover (approximately 5 percent) that is typical of this area of the Lower Colorado River Valley Subdivision of Sonoran Desertscrub (Brown, 1994). Soils in the project area are sandy, and the only topography consists of sand hummocks that have formed around individual creosote bushes throughout the proposed project area. No washes are present within the proposed project area. The proposed project area contains a low diversity and density of plants. Seven plant species were observed during the April 7, 2016 site visit. Plants documented during the site visit include creosote bush, white bursage (*Ambrosia dumosa*), Arizona

honeysweet (*Tidestromia oblongifolia*), cryptantha (*Cryptantha* sp.), Schott's wire lettuce (*Stephanomeria schottii*), a single whitestem milkweed (*Asclepias albicans*), and Mediterranean grass (*Schismus* sp.). None of these species are covered under the Arizona Native Plant Law (ANPL) (Arizona Department of Agriculture, 2016).

Noxious Weeds and Invasive Plant Species

Executive Order 13112, *Invasive Species,* of February 3, 1999, requires federal agencies to evaluate the potential for proposed projects to spread or introduce noxious weeds and/or invasive plant species. These nonnative plant species can cause significant changes to ecosystems, upset the ecological balance, and cause economic harm to our nation's agricultural and recreational sectors. During the site visit in April 2016, the project area was surveyed for invasive and/or noxious weeds by a qualified biologist. No state or federally listed noxious weed species were present. Mediterranean grass, an invasive, non-native species, is present throughout the project area.

Wildlife

Typical wildlife found in the Lower Colorado River Valley Subdivision of Sonoran Desertscrub include species adapted to hot, arid conditions.

Mammals

No mammals were observed in the project area during the April 7, 2016, site visit. However, signs of coyote (*Canis latrans*) use of the area were observed, including scat, previously used burrows, and scattered bones, including bones of a desert cottontail (*Sylvilagus audubonii*). Other mammals likely to be present could include kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), white-footed mice (*Peromyscus* spp.), and black-tailed jackrabbit (*Lepus californicus*) (Brown, 1994).

Birds

One bird species was observed during the site visit: verdin (*Auriparus flaviceps).* Three areas in the project area contain burrows suitable for use by and sign of previous use (abundant pellets) by western burrowing owl (*Athene cunicularia hypugaea*). No burrowing owls were observed in the project area during the site visit, and pellets were all degraded and not from recent use. Other species likely to be present include mourning dove (*Zenaida macroura*), red tailed-hawk (*Buteo jamaicensis*), and common raven (*Corvus corax*) (Brown, 1994).

Amphibians and Reptiles

Two reptile species were observed in the project area during the April 7, 2016, site visit: Yuma fringe-toed lizard (*Uma rufopunctata*) and zebra-tailed lizard (*Callisaurus draconoides*). Two additional species, sidewinder (*Crotalus cerastes*) and western shovel-nosed snake (*Chionactis klauberi*), were observed on April 14, 2016, during cultural resources surveys. The project area is also habitat for the flat-tailed horned lizard (FTHL) (*Phrynosoma mcallii*) and is considered occupied habitat for the species based on the requirements in the Flat-tailed Horned Lizard Rangewide Management Strategy. The project area is within the southeastern population of the species and is just west of the Yuma Desert Management Area (Flat-tailed Horned Lizard Interagency Coordinating Committee, 2003). No amphibian species were observed during the site visit, and none are likely to inhabit the area because of their need for moisture, which is lacking in the project area.

Other reptile species likely to occur in the project area include desert iguana (*Dipsosaurus dorsalis*), long-nosed leopard lizard (*Gambelia wislizenii*), tiger whiptail (*Aspidoscelis tigris*), and gopher snake (*Pituophis catenifer*), among others.

Fish

No fish are present in the project area as there is no perennial water present. The nearest habitat for fish is approximately 6 miles west of the project area at the Colorado River.

Federally Listed and Special-Status Species

The U.S. Fish and Wildlife Service (USFWS) maintains a list of protected species and the critical habitat that are known to occur in each Arizona county. The USFWS online database was accessed to obtain information on federally listed species that may occur in Yuma County. These species are currently listed or are proposed for listing as endangered or threatened under the Endangered Species Act (ESA) (16 United States Code [USC] 1531 et seq.). The ESA specifically prohibits the "take" of a listed species. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct."

Only species listed by the USFWS are afforded protection under the ESA. The special-status species evaluated in this environmental assessment (EA) were based on the list of endangered, threatened, and non-essential experimental population (NEP), for Yuma County, Arizona, generated through the USFWS Information for Planning and Conservation (IPaC) system, available at the USFWS website. **Appendix A** provides the IPaC list for Yuma County.

The Arizona Game and Fish Department (AGFD) monitors species of greatest conservation need (SGCN). SGCN is an AGFD status listing defined as wildlife of conservation priority – described nationally as Wildlife of Greatest Conservation Need. As discussed in the AGFD's State Wildlife Action Plan (SWAP), formerly known as the Comprehensive Wildlife Conservation Strategy, SGCN are species of vertebrates, crustaceans, and mollusks that rank high in the vulnerability category and have been identified for immediate action. Each species was assessed in terms of vulnerability and assigned as either a Tier 1a, 1b, or 1c ranking, with Tier 1a being the highest threat level (2012).

Some bird species receive legal protection under the federal Migratory Bird Treaty Act (MBTA) (16 USC 703–712), which provides federal protection to all migratory birds, including nests and eggs. Some nesting habitat is present in the project area and vicinity. However, most of the SGCN bird species known from within 3 miles of the project area would be more likely to occur along the Colorado River. In order to relocate or alter any MBTA-protected nests, it would be necessary to obtain a permit from the USFWS to maintain compliance with the MBTA. However, Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required in order to comply with the MBTA. If an active nest is observed before or during construction in the nesting season of southern Arizona bird species (generally February through September), measures should be taken to protect the nest from destruction and to avoid a violation of the MBTA (California Partners in Flight, 2009).

In addition, the Arizona Department of Agriculture (ADA) provides protection for native plant species under the ANPL (Arizona Revised Statutes 3-904). This law states that protected plants cannot be removed from any lands, including private lands, without permission and a permit from the ADA. Highly

Safeguarded native plants are those species for which removal is not allowed except with an ADA scientific permit; no collection of these plants is allowed. Salvage Restricted native plants are those plants for which a salvage permit is required; collection is allowed only with a permit. The Salvage Assessed category includes those for which a salvage permit is required for removal. Plants in the Harvest Restricted category are protected because they are subject to excessive harvesting or overcutting as a result of the intrinsic value of their by-products, fiber, or woody parts, and a harvest permit is required.

Species Evaluation

The potential for occurrence of each ESA species was summarized according to the categories listed below. Because not all species are accommodated precisely by a given category (i.e., category definitions may be too restrictive), an expanded rationale for each category assignment is provided. Potential for occurrence categories are as follows.

- Known to occur—the species has been documented in the project area by a reliable observer.
- May occur—the project area is within the species' currently known range, and vegetation communities, soils, etc., resemble those known to be used by the species.
- Unlikely to occur—the project area is within the species' currently known range, but vegetation communities, soils, etc., do not resemble those known to be used by the species, or the project area is clearly outside the species' currently known range.

None of the seven species listed as threatened, endangered, or NEP for Yuma County by the USFWS are likely to occur in the project area. The project area is clearly beyond the known geographic or elevational range of these species, or it does not contain vegetation or landscape features known to support these species, or both. In addition, no proposed or designated critical habitat for any species is present within the project area. Habitat requirements and potential for occurrence for these seven species are summarized in **Table 3.6.**

Table 3.6 Federally Listed Species Potentially Occurring in Yuma County, Arizona

Common Name (Species Name)	ESA Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area
Bonytail chub (*Gila elegans*)	E	Found at elevations from approximately 200–1,200 amsl in the Colorado River in La Paz, Mohave, and Yuma Counties, Arizona, where it has been observed in pools and eddies. The species is also found in reservoirs, such as Lake Mohave, where they use a variety of habitats.	Unlikely to occur. There are no permanent water sources suitable for this species in or adjacent to the project area. The nearest potential habitat would be at the Colorado River, approximately 6 miles west of the project area.
Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*)	E	Found in southern Arizona from the Picacho Mountains southwesterly to the Agua Dulce Mountains and southeasterly to the Galiuro and Chiricahua Mountains at elevations between 1,600 and 11,500 feet amsl. Roosts in caves, abandoned mines, and unoccupied buildings at the base of mountains where agave (*Agave* spp.), saguaro (*Carnegiea gigantea*), and organ pipe cacti (*Stenocereus thurberi*) are present. Forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti. The foraging radius may be 30 to 60 miles per night or more.	Unlikely to occur. No suitable roosting sites or forage plants are present in the project area.
Razorback sucker (*Xyrauchen texanus*)	E	Found in riverine and lacustrine areas, generally not in fast-moving water, and may use backwaters at elevations below 6,000 feet amsl.	Unlikely to occur. There are no permanent water sources suitable for this species in or adjacent to the project area. The nearest potential habitat would be at the Colorado River, approximately 6 miles west of the project area.
Sonoran pronghorn (*Antilocapra americana sonoriensis*)	E/NEP	Found in Sonoran desertscrub within broad, intermountain alluvial valleys with creosote bush-bursage (*Ambrosia* spp.) and palo verde (*Parkinsonia* spp.)–mixed cacti associations at elevations between 2,000 and 4,000 feet amsl. The only extant U.S. population is in southwestern Arizona.	Unlikely to occur. No pronghorn reintroductions have occurred in this area, and it is outside the current known species' range and the designated 10(j) area for the species.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Found in dense riparian habitats along streams, rivers, and other wetlands where cottonwood, willow, boxelder (*Acer negundo*), saltcedar (*Tamarix* spp.), Russian olive (*Elaeagnus angustifolia*), buttonbush (*Cephalanthus* spp.), and arrowweed (*Pluchea sericea*) are present. Nests are found in thickets of trees and shrubs, primarily those that are 13 to 23 feet high, among dense, homogeneous foliage. Habitat occurs at elevations below 8,500 feet amsl.	Unlikely to occur. No riparian habitat is present in or near the project area. The nearest potential habitat would be at the Colorado River, approximately 6 miles west of the project area.
Yellow-billed cuckoo (*Coccyzus americanus*)	T	Typically found in riparian woodland vegetation (cottonwood, willow, or saltcedar) at elevations below 6,600 feet amsl. Dense understory foliage appears to be an important factor in nest site selection. The highest concentrations in Arizona are along the Agua Fria, San Pedro, upper Santa Cruz, and Verde River drainages and Cienega and Sonoita Creeks.	Unlikely to occur. No riparian habitat is present in or near the project area. The nearest potential habitat would be at the Colorado River, approximately 6 miles west of the project area.
Yuma clapper rail (*Rallus longirostris yumanensis*)	E	Found in freshwater and brackish marshes below 4,500 feet amsl.	Unlikely to occur. No riparian habitat is present in or near the project area. The nearest potential habitat would be at the Colorado River, approximately 6 miles west of the project area.

* USFWS Status Definitions

E = Endangered. Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

NEP = Non-essential Experimental Population. Experimental populations of a species designated under Section 10(j) of the ESA for which the USFWS, through the best available information, believes is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under an NEP designation.
T = Threatened. Threatened species are those in imminent jeopardy of becoming endangered. The ESA prohibits the take of a species listed as threatened under Section 4d of the ESA. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct

Sources: (Arizona Rare Plant Committee, 2000) (Corman & Wise-Gervais, 2005) (Arizona Game and Fish Department, 2016) (U.S. Fish and Wildlife Service, 2016)

Special-Status Species

The AGFD maintains a statewide database, known as the Heritage Data Management System (HDMS), which tracks records for federally listed species and other species of special concern. This database can be accessed through the AGFD online environmental review tool. SWCA accessed the database and received a response document and receipt (**Appendix B**).

The AGFD's Arizona Heritage Geographic Information System (AZHGIS)-generated response reported that FTHL and sand food (*Pholisma sonorae*) are known to occur within 3 miles of the project area (2016). The project area is suitable habitat for, and is assumed to be occupied by, FTHL. No species-specific surveys for sand food were conducted. However, they were not observed during the site visit, and the project area is below the elevation where the species is known to occur. In addition, 30 SGCN were identified as occurring within 3 miles of the project area. FTHL, sand food, and the SGCN species are addressed below in **Table 3.7**. Potential impacts and effects determinations for special-status species are provided in **Table 3.8**.

Table 3.7 Special-Status Species' Potential for Occurrence

COMMON NAME (SPECIES NAME)	STATUS AND SGCN TIER RANK*	RANGE OR HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE IN PROJECT AREA
Abert's towhee (*Melozone aberti*)	1B	Found in riparian woodlands with dense shrubs, as well as in urbanized areas.	Unlikely to occur. No riparian woodlands or urbanized area are present in the project area. The nearest riparian habitat is along the Colorado River, approximately 6 miles west of the project area.
American bittern (*Botaurus lentiginosus*)	1B	Found in emergent wetlands, marshlands, and wet meadows.	Unlikely to occur. No wetlands, marshlands, or wet meadows are present in the project area. The nearest potential habitat is along the Colorado River, approximately 6 miles west of the project area.
Arizona myotis (*Myotis occultus*)	1B	The species is usually found in ponderosa pine and oak-pine woodland near water. However, it is found along permanent water or in riparian forests in some desert areas, such as along the lower Colorado and Verde Rivers.	Unlikely to occur. No ponderosa pine, oak woodland, or riparian areas are present in the project area. The nearest potential habitat is along the Colorado River, approximately 6 miles west of the project area.
Bald eagle (*Haliaeetus leucocephalus*)	BGEPA 1A	Coastal areas, estuaries, inland waters, and riparian areas with adequate food supplies.	Unlikely to occur. No riparian areas or open water is present in the project area. The nearest potential habitat is along the Colorado River, approximately 6 miles west of the project area.
California leaf-nosed bat (*Macrotus californicus*)	1B	Found in Sonoran desertscrub. Roosts in mines, caves, and rock shelters.	May occur. Sonoran desertscrub is present in the project area where the species might forage; however, no suitable roosts are present in the project area.

Table 3.7 Special-Status Species' Potential for Occurrence- continued

Flat-tailed horned lizard (*Phrynosoma mcallii*)	CCA 1B	The species is found in areas with fine packed sand or pavement, overlain with loose, fine sand in areas that are sparse or lacking in vegetation in the Lower Colorado River Valley subdivision of Sonoran Desertscrub.	May occur. The species is assumed to occur based on the requirements in the *Flat-tailed Horned Lizard Management Strategy Plan*. The project area is within the southeastern population of the species and is just west of the Yuma Desert Management Area (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003).
Gila monster (*Heloderma suspectum*)	1A	Sonoran desertscrub, less often in desert grasslands and oak forests. Less frequent or absent on open, sandy, plains.	Unlikely to occur. The project area is in an open, sandy plain and is outside the known range of the species.
Gila woodpecker (*Melanerpes uropygialis*)	1A	Desertscrub areas with large cacti or trees suitable for nesting, riparian woodlands, and urban areas.	Unlikely to occur. No large cacti or trees are present in the project area or vicinity.
Gilded flicker (*Colaptes chrysoides*)	1B	Mature saguaro cactus forests and desert riparian areas.	Unlikely to occur. No saguaro cactus or riparian areas are present in the project area or vicinity.
Goode's horned lizard (*Phrynosoma goodei*)	1B	Flat, open areas in Sonoran desertscrub.	May occur. Sonoran desertscrub is present in the project area.
Greater western bonneted bat (*Eumops perotis californicus*)	1B	Sonoran desertscrub near cliffs. Foraging radius is up to 15 miles.	Unlikely to occur. There is Sonoran desertscrub in the project area that would be foraging habitat for the species. However, it is more than 20 miles from the nearest areas with cliffs, which is outside the known foraging range of the species (15 miles).
Harris' antelope squirrel (*Ammospermophilus harrisii*)	1B	Sonoran desertscrub.	May occur. Sonoran desertscrub is present in the project area.
Kit fox (*Vulpes macrotis*)	1B	Southwestern deserts in desertscrub and grasslands.	May occur. Desertscrub is present in the project area.
Le Conte's thrasher (*Toxostoma lecontei*)	1B	Desertscrub on dry flats with scattered, low shrubs, saltbush, and creosote bush flats.	May occur. Desertscrub is present in the project area.
Lincoln's sparrow (*Melospiza lincolnii*)	1B	Project area is in the wintering range of the species. Wintering habitat includes dense thickets and overgrown fields.	Unlikely to occur. There are no dense thickets or overgrown fields in the project area.
Little pocket mouse (*Perognathus longimembris*)	1B	Sandy soil in sagebrush and Sonoran desertscrub.	May occur. Sonoran desertscrub with sandy soils is present in the project area.

Table 3.7 Special-Status Species' Potential for Occurrence- continued

Mountain plover (*Charadrius montanus*)	1B	Semi-arid grasslands. Winters in desertscrub and agricultural fields.	May occur. Desertscrub and agricultural fields are present in the project area and vicinity.
Pacific wren (*Troglodytes pacificus*)	1B	Coniferous and mixed forests, primarily with dense understory, often near water.	Unlikely to occur. No woods, dense understory, or water is present in the project area or vicinity.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	1B	The species roosts in caves and mines from desertscrub to woodlands and coniferous forests. Night roosts may often be in abandoned buildings.	May occur. Desertscrub is present in the project area where the species might forage. However, no roosting habitat is present in the project area.
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	1B	Sonoran desert scrub and arid lowland habitats in southern Arizona and southern California. Roosts in crevices on cliff faces in rugged canyons.	May occur. Sonoran desertscrub is present in the project area where the species might forage; however, no suitable roosts are present in the project area.
Sand food (*Pholisma sonorae*)	HS	Drifting sandy soil and other sandy areas, in low desert between 490 and 1,345 feet amsl.	Unlikely to occur. This species is very rare, and while the project area has sandy soils, it is below the elevations where the species is known to occur. Further, although sandy soils and sand hummocks are present in the project area, no shifting sand dunes similar to where this species is known to occur are present.
Savannah sparrow (*Passerculus sandwichensis*)	1B	Meadows, prairies, and agricultural fields.	Unlikely to occur. Although there are agricultural areas in the project vicinity, the project area does not contain habitat for this species.
Sonoran Desert toad (*Incilius alvarius*)	1B	Sonoran desertscrub, semi-desert grasslands, oak, and occasionally pine-oak woodlands to about 5,800 feet. In the western portion of Arizona, the species is tied to permanent water, such as the edges of agriculture or major rivers.	May occur. There is agriculture in the project vicinity that could support the species. This could allow the species to use the project area for movement between agricultural areas.
Sonoran Desert tortoise (*Gopherus morafkai*)	1A	Occurs on primarily rocky, and often steep, hillsides and bajadas of Mohave and Sonoran desertscrub, typically at elevations below 7,800 feet amsl. May occur, but is less likely to occur, in desert grassland, juniper woodland, and interior chaparral habitats and even pine communities.	Unlikely to occur. Habitat in the project area may be suitable as dispersal habitat for this species. However, the project area is many miles from the types of habitats that are normally occupied by the species.
Spotted bat (*Euderma maculatum*)	1B	Found in low desert in southwestern Arizona and riparian habitats. Roosts in cracks and crevices in cliff faces.	May occur. The project area is in low desert where the species might forage; however, no roosting habitat in present in the project area or vicinity.

Table 3.7 Special-Status Species' Potential for Occurrence- continued

Sprague's pipit (*Anthus spragueii*)	1A	Found in native grasslands with vegetation of intermediate height and lacking woody shrubs below 5,000 feet amsl. In Arizona this species is a rare but regular winter migrant from mid-October to March.	Unlikely to occur. No native grasslands are present in the project area or vicinity.
Western burrowing owl (*Athene cunicularia hypugaea*)	1B	Burrowing owl habitat consists of open areas with existing burrows characterized by sparse vegetation and bare ground.	May occur. Evidence of previous use of the area by the species was observed during field surveys. Burrows suitable for use and previously used by burrowing owls are present in the project area.
Yellow-billed cuckoo (Western DPS) (*Coccyzus americanus*)	T 1A	Typically found in riparian woodland vegetation (cottonwood, willow, or saltcedar) at elevations below 6,600 feet amsl. Dense understory foliage appears to be an important factor in nest site selection. The highest concentrations in Arizona are along the Agua Fria, San Pedro, upper Santa Cruz, and Verde River drainages and Cienega and Sonoita Creeks.	See Table 3.6.
Yuma clapper rail (*Rallus longirostris yumanensis*)	E 1A	Found in freshwater and brackish marshes below 4,500 feet amsl.	See Table 3.6.
Yuma hispid cotton rat (*Sigmodon hispidus eremicus*)	1B	Dense grassy areas such as fields and along roadside edges, brushy or weedy areas among weeds and cattails along the Colorado River and streams or ponds, in irrigated fields, and desertscrub.	May occur. Desertscrub and irrigated fields are present in the project vicinity.

Notes:
BGEPA = Protected under the Bald and Golden Eagle Protection Act.
CCA = Protected under a Candidate Conservation Agreement.
DPS = Distinct Population Segment.
E = Protected as Endangered under the ESA.
HS = Protected as Highly Safeguarded under the ANPL.
T = Protected as Threatened under the ESA.
* Tier 1A and 1B = An AGFD tiered listing for SGCN regarding the species level of vulnerability and the AGFD's priority level for management, with Tier 1A being the highest threat level.
Sources: (Arizona Game and Fish Department, 2016) (Arizona Rare Plant Committee, 2000) (Corman & Wise-Gervais, 2005) (U.S. Fish and Wildlife Service, 2016)

3.3.2 Environmental Consequences

3.3.2-1 No Action

Under the No-Action alternative, Rolle Airfield would not be expanded, and there would be no additional impacts on biological resources.

3.3.2-2 Proposed Action

Vegetation

Potential impacts and effects determinations for special-status plant species, including species covered under the ANPL, are addressed in **Table 3.8** below.

Construction Activities

Implementation of the proposed action would involve the removal of vegetation during construction activities resulting in the direct loss of plant communities. The primary direct and indirect impacts to vegetation during construction and operation and maintenance of the proposed Project would be associated with removal and/or crushing of natural, native species–dominated vegetation communities; decreased plant productivity from fugitive dust; and plant community fragmentation.

Construction activities would remove approximately 116 acres of vegetation. Vegetation removal could have a variety of effects on vegetation communities, ranging from changes in community structure and composition in the project area to alteration of soil moisture or nutrient regimes. These impacts could change the functional qualities of vegetation, including habitat and forage.

Fugitive dust from construction and maintenance traffic has the potential to affect photosynthetic rates and decrease plant productivity. The overall impact on vegetation from fugitive dust would be localized, would be reduced by implementation of dust control measures, and would be reduced below significance once construction activities are completed.

Invasive and Noxious Weeds

Construction activities could introduce or spread invasive and noxious weeds within and into the project area. Implementation of best management practices (BMPs), including washing of construction vehicles and equipment before and after use in the project area, would reduce the potential for the introduction and spread of invasive and noxious weeds into and from the project area.

Operations

No additional impacts on vegetation are anticipated from operation of the proposed project.

Invasive and Noxious Weeds

Potential impacts on vegetation from operations of the proposed project would be limited to the potential introduction of invasive and/or noxious weeds from users of the airport.

Because vegetation types to be disturbed are common in the project vicinity, and with the implementation of BMPs, impacts from the proposed project on vegetation and noxious weeds would be minimal.

Wildlife

Construction Activities

Potential construction-related impacts from the proposed project common to all wildlife groups would include the loss, degradation, and/or fragmentation of habitats; collisions with and crushing by construction vehicles; loss of burrowing animals in burrows in areas where grading would occur; entrapment in trenches; increased invasive and noxious weed establishment and spread; and increased noise/vibration levels.

Over the life of the project, approximately 116 acres of wildlife habitat would be lost. The loss of this habitat would also fragment existing habitat in the vicinity. However, portions of the project area have been previously developed, and project-related increases in fragmentation in relation to existing conditions would be minor.

Construction vehicles and equipment could collide with or crush wildlife species. Implementation of a project speed limit would minimize the potential for these impacts. Burrowing species that shelter underground would be susceptible to being crushed by construction equipment.

Open trenches can entrap wildlife species and lead to mortality. Implementation of BMPs, including either covering trenches or creating escape ramps in trenches at the end of work each day and checks of trenches prior to beginning work each day, would reduce the potential for wildlife entrapment. Individuals could be impacted by entrapment, but impacts would be unlikely to reach population levels.

Noise and vibration associated with construction activities may temporarily change habitat use patterns for some species. Some individuals would move away from the source(s) of the noise/vibration to adjacent or nearby habitats, which may increase competition for resources within these areas. Noise/vibration and other disturbances may also lead to increased stress on individuals, which could decrease their overall fitness through increased metabolic expenditures. Wildlife that use the project area are likely acclimated to the existing noise levels, which include aircraft landing and taking off. Potential noise and vibration effects from construction-related activities would be temporary and would cease with the completion of construction activities. Potential impacts from noise/vibration would likely be limited to individuals and would not be significant at the population level.

In general, no short- or long-term effects on migratory birds are anticipated from the implementation of the Proposed Action. Prior to vegetation clearing during the bird breeding season (February–September), pre-clearing nesting bird surveys would be conducted to ensure avoidance of any occupied nests. However, incidental mortality or displacement is possible on a local scale. Habitat types present in and along the project area are widespread elsewhere, and many birds occurring locally would likely move into adjacent habitats in response to the 116 acres of habitat loss.

Given the amount of wildlife habitat in the project vicinity and broader analysis area, implementation of BMPs, the temporary nature of construction activities, and the ability of many species to leave impacted areas, it is unlikely that there would be population-level or long-term impacts to wildlife from the implementation of the proposed action.

Operations

Potential impacts from operation and maintenance activities would be similar in nature to those previously described above for construction activities. However, the scope of impacts would be lower in magnitude than those for construction, as there would be less equipment and fewer people working. Operation and maintenance impacts would be temporary and would occur sporadically over the life of the proposed project.

Given the existing level of use of the airport, existing levels of disturbance, existing noise levels, the presence of similar habitat in the project vicinity, and the implementation of BMPs, impacts to wildlife would be moderate within areas to be developed and minor in areas adjacent to the project area.

Federally Listed Species

As no federally listed species are likely to occur in the project area, there would be no construction or operational impacts on those species from the proposed action.

Special-Status Species

Potential construction-related and operational impacts on special-status species, including AGFD SGCN known to occur within 3 miles of the project area, are given below in **Table 3.8**. Impacts on special-status species would be similar to those described above for vegetation and wildlife.

Impact determinations for special-status species not listed under the authority of the ESA are as follows:

- No impact—the project would have no impact on a species if 1) the species is considered unlikely to occur (range, vegetation, etc., are inappropriate); and 2) the species or its sign was not observed during surveys of the project area.
- Beneficial impact—the project is likely to benefit the species, whether it is currently present or not, by creating or enhancing habitat elements known to be used by the species.
- May impact individuals but is not likely to result in a trend toward federal listing or loss of viability—the project is not likely to adversely impact a species if 1) the species may occur but its presence has not been documented; and 2) project activities would not result in disturbance to areas or habitat elements known to be used by the species.
- May impact individuals and is likely to result in a trend toward federal listing or loss of viability—the project is likely to adversely impact a species if 1) the species is known to occur in the project area; and 2) project activities would disturb areas or habitat elements known to be used by the species, or would directly affect an individual.

Table 3.8 Special-Status Species Impact and Effect Determinations

COMMON NAME (SPECIES NAME)	CONSTRUCTION-RELATED IMPACTS	OPERATIONAL IMPACTS	IMPACT AND EFFECT DETERMINATIONS
Abert's towhee (*Melozone aberti*)	None.	None.	No impact.
American bittern (*Botaurus lentiginosus*)	None.	None.	No impact.
Arizona myotis (*Myotis occultus*)	None.	None.	No impact.
Bald eagle (*Haliaeetus leucocephalus*)	None.	None.	No impact.
California leaf-nosed bat (*Macrotus californicus*)	Removal of foraging habitat for the species on 116 acres. No impacts to roosting habitat.	None.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability. The loss of foraging habitat would be minimal compared to the amount of available foraging habitat in the project vicinity.
Flat-tailed horned lizard (*Phrynosoma mcallii*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Gila monster (*Heloderma suspectum*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Gila woodpecker (*Melanerpes uropygialis*)	None.	None.	No impact.
Gilded flicker (*Colaptes chrysoides*)	None.	None.	No impact.
Goode's horned lizard (*Phrynosoma goodei*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Greater western bonneted bat (*Eumops perotis californicus*)	None.	None.	No impact.

Table 3.8 Special-Status Species Impact and Effect Determinations - continued

Harris' antelope squirrel (*Ammospermophilus harrisii*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Kit fox (*Vulpes macrotis*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Le Conte's thrasher (*Toxostoma lecontei*)	Removal of approximately 116 acres of habitat. Temporary noise impacts. Potentials for collisions with vehicles.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Lincoln's sparrow (*Melospiza lincolnii*)	None.	None.	No impact.
Little pocket mouse (*Perognathus longimembris*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Mountain plover (*Charadrius montanus*)	Removal of approximately 116 acres of habitat. Temporary noise impacts. Potentials for collisions with vehicles.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions with vehicles.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Pacific wren (*Troglodytes pacificus*)	None.	None.	No impact.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	Removal of approximately 116 acres of potential foraging habitat.	None.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	Removal of approximately 116 acres of potential foraging habitat.	None.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Sand food (*Pholisma sonorae*)	None.	None.	No impact.
Savannah sparrow (*Passerculus sandwichensis*)	None.	None.	No impact.

Table 3.8 Special-Status Species Impact and Effect Determinations - continued

Sonoran Desert toad (*Incilius alvarius*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Sonoran Desert tortoise (*Gopherus morafkai*)	None.	None.	No impact. In the unlikely event a desert tortoise is observed at the project site, the AGFD *Guidelines for Sonoran Desert Tortoises Found on Development Projects* (2016) should be followed.
Spotted bat (*Euderma maculatum*)	Removal of approximately 116 acres of potential foraging habitat.	None.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Sprague's pipit (*Anthus spragueii*)	None.	None.	No impact.
Western burrowing owl (*Athene cunicularia hypugaea*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	None.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
Yellow-billed cuckoo (Western DPS) (*Coccyzus americanus*)	None.	None.	No effect. No riparian areas or open water are present in the project area. The nearest potential habitat is along the Colorado River, approximately 6 miles west of the project area.
Yuma clapper rail (*Rallus longirostris yumanensis*)	None.	None.	No effect.
Yuma hispid cotton rat (*Sigmodon hispidus eremicus*)	Removal of approximately 116 acres of potential habitat. Temporary noise impacts. Potential for collisions with or burial by construction equipment. Implementation of BMPs would reduce the potential for collisions or burial.	Potential for collisions with vehicles. Implementation of BMPs would reduce the potential for collisions.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.

Note: DPS = Distinct Population Segment.
Source: (Arizona Game and Fish Department, 2016) (Arizona Rare Plant Committee, 2000) (Corman & Wise-Gervais, 2005) (U.S. Fish and Wildlife Service, 2016)

3.3.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate impacts to biological resources:

- To avoid the introduction or spread of noxious or invasive plants species to and from the project area, all construction equipment will be washed prior to entering and leaving the project area.
- To avoid impacts on nesting birds, construction will occur outside the migratory bird breeding season (generally February to September), or if work occurs during breeding season, the areas to be disturbed will be surveyed for the presence of nesting migratory birds prior to the initiation of ground-disturbing activities.
- To avoid impacts to bats and nocturnal animals, construction activities would be limited to daylight hours.

Flat-tailed horned lizard

The following management and mitigation measures are specific to the flat-tailed horned lizard:

- Prior to project initiation, an individual shall be designated as a field contact representative. The field contact representative shall have the authority to ensure compliance with protective measures for the FTHL and will be the primary agency contact dealing with these measures. The field contact representative shall have the authority and responsibility to halt activities that are in violation of these terms and conditions.
- All project work areas shall be clearly flagged or similarly marked at the outer boundaries to define the limit of work activities. All construction and restoration workers shall restrict their activities and vehicles to areas that have been flagged to eliminate adverse impacts to the FTHL and its habitat. All workers shall be instructed that their activities are restricted to flagged and cleared areas.
- Within FTHL habitat, the area of disturbance of vegetation and soils shall be the minimum required for the project. If possible, specify a maximum disturbance allowable based on the specifics of the project. Clearing of vegetation and grading shall be minimized. Wherever possible, rather than clearing vegetation and grading the ROW, equipment and vehicles shall use existing surfaces or previously disturbed areas. Where grading is necessary, surface soils shall be stockpiled and replaced following construction to facilitate habitat restoration. To the extent possible, disturbance of shrubs and surface soils due to stockpiling shall be minimized.
- Existing roads shall be used for travel and equipment storage whenever possible.
- Where feasible and desirable, in the judgment of the lead agency, newly created access routes shall be restricted by constructing barricades, erecting fences with locked gates at road intersections, and/or posting signs. In these cases, the project proponent shall maintain, including monitoring, all control structures and facilities for the life of the project and until habitat restoration is completed.
- A biological monitor shall be present in each area of active surface disturbance throughout the work day from initial clearing through habitat restoration, except where the project is completely fenced and cleared of FTHLs by a biologist (see Measure 8 of the Flat-tailed Horned Lizard Rangewide Management Strategy). The biological monitors shall meet the requirements set in Appendix 6 of the Flat-tailed Horned Lizard Rangewide Management Strategy (Flat-tailed Horned Lizard Interagency Coordinating Committee, 2003). The monitor(s) shall perform the following functions:

- Develop and implement a worker education program. Wallet-cards summarizing this information shall be provided to all construction and maintenance personnel. The education program shall include the following aspects at a minimum:
    a. biology and status of the FTHL,
    b. protection measures designed to reduce potential impacts to the species,
    c. function of flagging designating authorized work areas,
    d. reporting procedures to be used if a FTHL is encountered in the field, and
    e. importance of exercising care when commuting to and from the project area to reduce mortality of FTHLs on roads.
- Ensure that all project-related activities comply with these measures. The biological monitor shall have the authority and responsibility to halt activities that are in violation of these terms and conditions.
- Examine areas of active surface disturbance periodically (at least hourly when surface temperatures exceed 85ºF) for the presence of FTHLs. In addition, all hazardous sites (e.g., open pipeline trenches, holes, or other deep excavations) shall be inspected for the presence of FTHLs prior to backfilling.
- Work with the project supervisor to take steps, as necessary, to avoid disturbance to FTHLs and their habitat. If avoiding disturbance to an FTHL is not possible or if an FTHL is found trapped in an excavation, the affected lizard shall be captured by hand and relocated.
- The project proponent shall develop a project-specific habitat restoration plan under approval by the lead agency. The plan shall consider and include as appropriate the following methods: replacement of topsoil, seedbed preparation, fertilization, seeding of species native to the project area, noxious weed control, and additional erosion control. Generally, the restoration objective shall be to return the disturbed area to a condition that will perpetuate previous land use. The project proponent shall conduct periodic inspection of the restored area. Restoration shall include eliminating any hazards to FTHLs created by construction, such as holes and trenches in which lizards might become entrapped. Disturbance of existing perennial shrubs during restoration shall be minimized, even if such shrubs have been crushed by construction activities.
- Construction of new paved roads shall include a lizard barrier fence on each side of the road that is exposed to occupied FTHL habitat. Exceptions may occur in accordance with the following evaluation, to be applied separately to each side of the road. This prescription may also be applied to canals or other fragmenting projects.
    - Side is made nonviable for FTHLs even if connected to the other side: Compensate for the entirety of the fragmented parcel.
    - Side is viable only if connected to the other side: Compensate for the entirety of the fragmented parcel, or provide fencing and effective culverts or underpasses that will maintain connectivity.
    - Side is viable even if not connected to the other side: Provide fencing (no culverts)

3.3.4 Best Management Practices

The following BMPs are proposed specifically for the flat-tailed horned lizard:

- If the project area is outside an FTHL Management area and per the FTHL Flat-tailed Horned Lizard Rangewide Management Strategy, compensation for FTHL habitat loss should be at a 1:1

ratio in areas outside Management Areas. The compensation acreage may be replaced or adjusted to a monetary equivalent (including administrative costs) that is required to replace the acreage or adjusted acreage (Flat-tailed Horned Lizard Interagency Coordinating Committee, 2003). The compensation rate within the Yuma area is $621 per acre.

3.4 Cultural/Historic Resources

3.4.1 Affected Environment

Project Area/Area of Potential Effects (APE): The APE for the specific proposed improvement projects will vary depending on the stage of development, but all will be contained entirely within the APE considered for this archaeological investigation. All ground-disturbing activities will be confined to the 131.0-acre surveyed area. See **Appendix C** for the complete survey report conducted by SWCA Environmental in May 2016.

Legal Description: The project area is located in Sections 25–26 and 34–35, Township 10 South, Range 24 West; and Section 2, Township 11 South, Range 24 West; Yuma County, Gila and Salt River Baseline and Meridian, as found on the U.S. Geological Survey Somerton, Arizona, 7.5-minute quadrangle.

Land Jurisdiction(s): Reclamation

Total Acres: 131.0 acres

Acres Surveyed: 131.0 acres

Acres Not Surveyed: N/A

Consultant Firm/Organization: SWCA Environmental Consultants

Project Number: 34571

Permit Number(s): Archaeological Resources Protection Act Permit No. LC-AZ-16-05

ASM Accession No.: N/A

Date(s) of Fieldwork: April 11-12, 2016

Number of IOs Recorded: 8

Number of Sites Recorded: One (AZ X:6: 135[ASM])

Eligible Sites: None

Ineligible Sites: One

Unevaluated Sites: N/A

Sites not Relocated: N/A

Table 3.9 Site Summary Table

LAND JURISDICTION	IDENTIFICATION STATUS (NEWLY OR PREVIOUSLY RECORDED)	SITE NUMBER PROPERTY ADDRESS	NRHP ELIGIBILITY STATUS/ CRITERION/CRITERIA	RECOMMENDED TREATMENT
U.S. Bureau of Reclamation	Newly recorded	AZ X:6: 135(ASM) /Aux No. 4	Ineligible	No further work

Source: (SWCA Environmental Consultants, 2016)

3.4.2 Environmental Consequences/Impacts

3.4.2-1 No Action

Under the No-Action Alternative, no project-related adverse effects would affect any archaeological or historic sites located within the project APE.

3.4.2-2 Proposed Action

The proposed action alternative would have no project-related adverse effects to any archaeological or historic sites located within the project APE. SWCA recommends AZ X:6:135 (ASM) as ineligible for listing on the ARHP/NRHP based on the existence of other auxiliary airfields on the Barry M. Goldwater Range (BMGR) in original condition and already determined NRHP eligible by the Department of Defense and the Arizona SHPO. All of these auxiliary airfields exhibit standard design and construction techniques for U.S. Army Air Force installations of WWII. Construction and use of Aux No. 4 in its WWII context is sufficiently documented and other similar facilities on BMGR are better preserved and available for further study (Thompson, 2004).

3.4.3 Management and Mitigation Measures

There are no management and mitigation measures proposed.

3.4.4 Best Management Practices

The following BMP's are recommended:

- If previously undocumented buried cultural resources are identified during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery until a qualified archaeologist has documented the discovery and evaluated its eligibility for the Arizona or Nation Register of Historic Places, as appropriate, and Tribes have been consulted, as appropriate. Work must not resume in this area without approval of the lead agency.
- If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery. The Arizona State Museum, lead agency, SHPO, and appropriate Tribes must be notified of the discovery within 24 hours (following ASM and/or agency protocol). All discoveries will be treated in accordance with Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 United States Code 3001-3013) and work must not resume in this area without proper authorization from ASM and the lead agency.

3.5 Geology and Soils

This section describes the geology and soil types in the project area that may be influenced by the Proposed Action.

3.5.1 Affected Environment

The geology of the area consists primarily of unconsolidated to strongly consolidated alluvial and eolian deposits. This area includes: coarse, poorly sorted alluvial fan and terrace deposits on middle and upper piedmonts and along large drainages; sand, silt and clay on alluvial plains and playas; and wind-blown sand deposits (U.S. Geological Survey, 2016).

The soil classification within the subject area is identified as Superstition Sand. This deep, somewhat excessively drained soil is on the old terrace of the Colorado River. It formed in mixed sandy alluvium. Elevation ranges from 100 to 600 feet. The average annual air temperature ranges from 72 to 76 degrees Fahrenheit, and the average freeze-free period ranges from 250 to 325 days. Typically, the surface layer is light brown sand about 5 inches thick. The underlying material to a depth of 60 inches or more is light brown and pink sand and contains few to many soft lime masses. In some places the surface layer is loamy sand. Available water capacity is low to moderate. Surface runoff is very slow. The hazard of soil blowing is high (Soil Survey Staff, 2016).

Furthermore, this area of study is at a moderate risk for earthquakes. This risk is caused by the proximity of the nearby San Andreas Fault and its splay faults, the Imperial and Algodones faults (The Arizona Geological Survey, 2012).

3.5.2 Environmental Consequences/Impacts

3.5.2-1 No Action

Implementation of the No-Action Alternative would not affect or change the local geology or soil properties in the area because ground disturbing activities that may affect these resources would not occur.

3.5.2-2 Proposed Action

The proposed action may have short-term direct and indirect effects on local soil composition. Construction practices for the proposed planned development could potentially result in soil erosion at the project site. However, soils when replaced, would be compacted tightly to prevent any access erosion. When considering the proposed development, there are no apparent obstacles with respect to topography, soil type, and geology.

3.5.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate any potential effects to local soils from the Project:

- Where practical, existing access roads will be utilized to enter and exit the work area.
- Soils, when replaced, should be compacted tightly to prevent any excess erosion.

3.5.4 Best Management Practices

There are no BMPs proposed.

3.6 Hazardous and Solid Waste

This section describes and identifies hazardous materials and solid waste that have the potential to occur in the project area that may be affected by the Proposed Action.

3.6.1 Affected Environment

Most of the regulations for the management of materials that are considered hazardous for the human environment are governed by the Occupational Safety and Health Administration (OSHA). OSHA

provides guidance regarding handling hazardous and flammable liquids and gases, storing these materials, and providing employee education and awareness programs. The hazardous and solid waste associated with the project area would not have impact on the surrounding environment as proper OSHA guidelines for disposal of such materials would be complied with.

3.6.2 Environmental Consequences/Impacts

3.6.2-1 No Action

Implementation of the No-Action Alternative would not create any ground disturbing activities that may affect hazardous materials in the area nor produce solid waste that may be the byproduct of construction activity. Therefore, there would be no change to existing conditions.

3.6.2-2 Proposed Action

Proposed Action construction would create quantities of construction waste that would require disposal. Any of the hazardous waste associated with the construction of the proposed action will be disposed of properly as to not pose a further hazard. OSHA guidelines on how to handle and dispose of these materials will be followed to ensure no impact on the surrounding environment.

3.6.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate any potential effects of hazardous or solid wastes within the study area:

- A site-specific spill contingency plan will include reporting guidelines and training of employees in the use of the required equipment, in addition to proper handling and storage of potentially hazardous materials or Petroleum, Lubricants, and Oils (PLO); and
- If previously unidentified or suspect hazardous materials are encountered during construction, work will stop immediately and the Reclamation Environmental Manager will be contacted.

3.6.4 Best Management Practices

There are no BMPs proposed.

3.7 Water Resources

This section discusses the surface and groundwater resources in the project area that may be affected by implementation of the Proposed Action.

3.7.1 Affected Environment

Surface Water

The project area is located within the Yuma Desert Watershed. The Yuma Desert Watershed does not have any naturally occurring perennial streams within the watershed. The Colorado River is the only perennial stream in the vicinity of the area. However, the Colorado River is located over six miles to the West of the proposed project area. The project area lies outside of the 100-year floodplain (Federal Emergency Management Agency, 2016).

Groundwater

Water from rainfall eventually seeps into the ground and occupies the interstices of soil layers and slowly migrates to underground conveyances called aquifers. A few of these large gravel aquifers, collectively known as the Yuma Basin, underlie the project study area. The Yuma Basin covers approximately 750 square-miles of southwestern Arizona. Regional groundwater flow is to the southwest, with most groundwater recharge coming from the Colorado and Gila Rivers and infiltration of irrigation water. Only minor amounts are contributed by precipitation and local runoff. An estimated 49 million acre-feet of groundwater are in storage in the Yuma Basin to a depth of 1,200 feet. The basin contains two large reservoirs. The largest being Mittry Lake, and the other being the Morelos Diversion Dam (Towne & Yu, 1998).

Water Quality

Surface water is the primary source of drinking water, and is usually of better quality than the salt and nitrate-laden groundwater that is harder to treat. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. The ADEQ conducted a baseline study to assess the groundwater quality of the Yuma Groundwater Basin. The study found that the Yuma Groundwater Basin had no dominant water chemistry and is chemically similar to Colorado River water (Towne & Yu, 1998).

Jurisdictional Waters

The U.S. Army Corps of Engineers regulates potential impacts to waters of the United States, also known as jurisdictional waters. There are currently no jurisdictional waters located within the project area (U.S. Fish and Wildlife Service, 2016).

3.7.2 Environmental Consequences/Impacts

3.7.2-1 No Action

Implementation of the No-Action Alternative would not entail any construction activity; therefore, no impacts to surface water, groundwater, water quality, or jurisdictional waters would occur.

3.7.2-2 Proposed Action

Implementation of the Proposed Action Alternative would be anticipated to have minimal to no impact to water resources both on and off the project site. Minimal to no changes to drainage patterns are expected. Potential impacts could include impacts to surface water quality during construction. Impacts to water resources due to construction activity could include spills into drainage channels or infiltration into the soil which could degrade surface and/or groundwater quality. This event is highly unlikely as it is recommended to safely handle and dispose of oils and chemicals in a proper manner at approved disposal sites to prevent contamination of the water resources.

3.7.3 Management and Mitigation Measures

The following management and mitigation measure is recommended to mitigate any potential effects to water quality from the project area:

- Haul oils or chemicals to an approved site for disposal to address the prevention of oil products from entering into groundwater.

3.7.4 Best Management Practices

There are no BMPs proposed.

3.8 Land Use/Ownership

The study area for the land use inventory and analysis encompasses a 0.25 mile surrounding the proposed project limits. The analysis describes direct effects to land use and compares those potential project effects with applicable municipal planning documents for conformity.

3.8.1 Affected Environment

Land use in the area is mostly undeveloped land owned by the Bureau of Reclamation. Approximately one mile to the east of the runway is a one square-mile parcel of privately owned land that is undeveloped. State trust land is located approximately one-quarter mile south of runway 17-35. The majority of the land within approximately two miles of the airfield is undeveloped, with a mix of agriculture and low-density single-family residential. However, the majority of the land outside this area is utilized for agriculture. All of the land within the 0.25 mile of the proposed project limits is undeveloped land owned by the Bureau of Reclamation (Arizona State Land Department, 2016).

3.8.2 Environmental Consequences/Impacts

3.8.2-1 No Action

Implementation of the No-Action Alternative would not change the existing land use/ownership. There would be no impacts or changes to the existing land use/ownership.

3.8.2.-2 Proposed Action

It is anticipated that the proposed planned development would have minimal to no long-term direct or indirect adverse effects on existing or planned land uses. The land surrounding Rolle Airfield is undeveloped and would not be adversely affected by the proposed development.

3.8.3 Management and Mitigation Measures

There are no management and mitigation measures recommended.

3.8.4 Best Management Practices

There are no BMPs proposed.

3.9 Noise

3.9.1 Affected Environment

The standards for justifying a noise analysis in accordance with a project is detailed in FAA Order 1050.1F, *Desk Reference (*Section 11.1.2). The *Desk Reference* states that a noise analysis is not required for projects involving Design Group I and II airplanes in Approach Categories A through D operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations or 700 annual jet operations (2015). The current and forecasted annual operations at the airport do not meet the required volume for Design Group I and II aircraft operating in approach categories A through D, thus a noise study will not be conducted for this assessment.

3.9.2 Environmental Consequences/Impacts

3.9.2-1 No Action

Implementation of the No-Action Alternative would not change the existing noise levels in the project area; therefore, no impacts or changes the existing ambient noise levels would occur.

3.9.2-2 Proposed Action

Implementation of the Proposed-Action Alternative would not severely impact the existing noise levels in the project area and the surrounding environment. As FAA Order 1050.1F states, the forecasted noise levels are not significant enough to warrant a noise analysis to be conducted for the surrounding environment. It is recommended that the Best Management Practices be followed when any construction related noise is caused from the Proposed Action Alternative.

3.9.3 Management and Mitigation Measures

The following management and mitigation measures are recommended to mitigate any potential effects to noise from the Proposed Action:

- Minimize equipment idling;
- Mufflers or other noise-suppression technology will be used; and
- Construction activities will be limited to daylight operation.

3.9.4 Best Management Practices

The following BMP is recommended to mitigate any potential impacts to noise:

- Adhere to the City of Yuma Noise Limitation standards where applicable (if construction is within 300 feet of a residence located within City of Yuma boundaries)

3.10 Indian Trusts Assets

It is Reclamation policy to protect Indian Trust Assets (ITAs), whenever possible, from adverse impacts caused by its programs and activities. ITAs are legal asset interests held in trust by the federal government for Indian Tribes or individuals. Types of actions that could affect ITAs include interference with the exercise of a reserved water right, degradation of water quality where there is no water right, impacts to fish and wildlife where there

is a hunting or fishing right, and increased noise levels near a land asset where such an increase adversely affects use of the reserved land (U.S. Bureau of Reclamation, 2016).

3.10.1 Affected Environment

No ITAs have been identified within the project study area (BIA Division of Land Titles and Records, 2010).

3.10.2 Environmental Consequences/Impacts

No ITAs have been identified within the project study area; therefore, the Proposed Action would have no impact on ITAs.

3.10.3 Management and Mitigation Measures

There are no management and mitigation measures recommended.

3.10.4 Best Management Practices

There are no BMPs proposed.

3.11 Socioeconomics

This section describes the demographic, economic, and social characteristics in the project study area and potential changes that may result from the Proposed Action. For this evaluation, census block data for the area adjacent to the project footprint was reviewed.

3.11.1 Affected Environment

Yuma County embodies 5,514 square-miles of land in the southwest corner of Arizona. As of 2015, Yuma County has a population of 204,275. The population has increased at an approximate rate of 4.4 percent over the last five years. The racial demographic is comprised of 32 percent White (not Hispanic or Latino), 62 percent Hispanic or Latino, 2.7 percent African American, 2.2 percent Native American, 1.5 percent Asian, 0.3 percent Pacific Islander, and 2.0 percent of two or more races. As of 2014, over a quarter of the Yuma County population were foreign born persons (U.S. Census Bureau, 2015).

The median household income for Yuma County is $41,380. Yuma County has a labor force of 91,257, with 76,765 persons employed. The unemployment rate of Yuma County in 2016 is 15.88 percent (U.S. Census Bureau, 2015). The primary industries in Yuma County are agriculture, military, and tourism. Agriculture accounts for the majority of the Yuma County economy at $3.3 billion annually. The Interstate 8 corridor runs directly through the City of Yuma adding significantly to the economy with over 6.5 million vehicles passing through each year (Morrison-Maierle, 2015).

The City of San Luis is located about 15 miles to the south of Yuma on the border of the United States and Mexico. Rolle Airfield is located in the north-central portion of the incorporated area of San Luis. As of 2010, the City of San Luis encompasses 32 square-miles with a population of 31,091. From 2010 to 2014, population in the City of San Luis has increased 11.4 percent. The racial demographic is comprised of 63.2 percent White, 0.3 percent African American, 0.5 percent Native American, 0.2 percent Asian, and 35.8 percent other. The City of San Luis consists of 98.7 percent of people who consider themselves to be of Hispanic or Latino heritage. As defined by the U.S. Census Bureau, Hispanic or Latino is a person of

Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. As of 2014, nearly half (45.2 percent) of the City of San Luis population were foreign born persons (U.S. Census Bureau, 2010).

The median household income in the City of San Luis is $31,064. San Luis City has a labor force of 17,793 with an unemployment rate of 67.1 percent The primary industries in the city of San Luis are agriculture (24.8 percent), education and health care (18.6 percent), and retail trade (10.7 percent) (U.S. Census Bureau, 2010). The City of San Luis also has a border crossing between the United States and Mexico, connecting the city with San Luis Rio Colorado in Sonora, Mexico. The City of San Luis experiences 2.6 million autos and 46,000 commercial vehicles traveling between Mexico and the United States annually. Shoppers from Mexico contribute approximately $160 million annually to Yuma County and the City of San Luis (Yuma County Chamber of Commerce, 2015).

3.11.2 Environmental Consequences/Impacts

3.11.2-1 No Action

Under the No-Action Alternative, no new land would be acquired and no changes in land use would occur. Therefore, the No-Action Alternative would not affect socioeconomics in the project area.

3.11-2-2 Proposed Action

The Proposed Action Alternative would increase the capacity of airport facilities, including hangars and apron area, along with a UAS launch and recovery site. With the increase in available airport facilities, the forecasted based aircraft are expected to increase to twelve aircraft by 2033 (Morrison-Maierle, 2015). The UAS launch and recovery site could potentially attract industrial and aerospace companies to Rolle Airfield to test and operate UAS systems. The potential attraction of aerospace and industrial UAS businesses could impact the socioeconomics by increasing the industrial and military workforce in the area to supply the UAS companies and their operations. The UAS storage at Rolle Airfield under the Proposed Action Alternative would increase total UAS stored aircraft to 45 by 2033. Furthermore, with the increase in facilities available under the Proposed Action Alternative, the annual general aviation operations are forecasted to increase to 10,420 by 2033, further increasing the economic impact of Rolle Airfield (Morrison-Maierle, 2015).

3.11.3 Management and Mitigation Measures

No management and mitigation measures are proposed to mitigate impacts to demographic, economic, and social characteristics in the project study.

3.11.4 Best Management Practices

No BMPs have been identified to mitigate impacts to demographic, economic, and social characteristics in the project study.

3.12 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Executive Order 12898 directs that federal programs,

policies, and activities not have a disproportionately high and adverse human health or environmental effect on minority and low-income populations (U.S. Environmental Protection Agency, 2015).

3.12.1 Affected Environment

The area located around the proposed project area has no residents and is undeveloped land owned by the Bureau of Reclamation. There is no population of people within the project area; thus, no displacements or adverse conditions will occur.

3.12.2 Environmental Consequences/Impacts

3.12.2-1 No Action

Under the No-Action Alternative, no new land would be acquired and no displacements would occur. Therefore, the No-Action Alternative would not affect protected populations in the project area.

3.12.2-2 Proposed Action

Under the Proposed Action Alternative, no new land would be acquired thereby resulting in no displacements. Therefore, the Proposed Action Alternative would not have a disproportionately high and adverse human health or environmental effect on minority and low-income populations in the project area.

3.12.3 Management and Mitigation Measures

There are no management and mitigation measures are recommended.

3.12.4 Best Management Practices

There are no BMPs proposed.

3.13 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action (1978)." Cumulative impacts include the total effect on a natural resource, ecosystem, or human community resulting from actions of federal, nonfederal, public, and/or private entities. Cumulative impacts may also include the effects of natural processes and/or natural events and can also be beneficial to the resources (Council on Environmental Quality, 1978). Cumulative impacts may result from individually minor, but collectively significant actions, that occur within the same temporal study area and surrounding communities.

3.13.1 Affected Environment

A portion of the Avenue E, SR 195 to County 18th Street project, sponsored by Yuma County and the Arizona Department of Transportation, is anticipated to occur within the project vicinity in the near future. The design concept development process and alternative analysis resulted in the recommendation to extend Avenue E as a new two-lane roadway from the existing T-intersection of Avenue E and SR 195 to just north of the intersection of Avenue D and County 18th Street. The horizontal alignment will pass to the

east of Rolle Airfield. According to the Final Design Concept Report, the eastern alignment was identified as the preferred alternative; The Yuma County Airport Authority preferred the eastern alignment due to its compatibility with proposed future airfield expansion (Psomas, 2015).

3.13.2 Environmental Consequences/Impacts

3.13.2-1 No Action

Under the No-Action Alternative, the airfield would remain in its present configuration, and no new development would occur. Potential impacts to the project vicinity that may occur due to the Avenue E project may include disturbances to biological resources, in particular the FTHL, and visual resources/aesthetics. According to the Final Design Concept Report for the Avenue E project, the FTHL would potentially be affected by ground disturbances for geotechnical exploration and project implementation (Psomas, 2015). Construction activities and ground disturbances for the Avenue E project may inadvertently cause a change in the biological resources found within the project study area due to displacement. Likewise, should the Avenue E project be constructed within the vicinity of the project area, a change to the aesthetics of Rolle Airfield would occur; the change would include the visible addition of a two-lane roadway that may be visible from within the project study area on the Airfield. The potential change in the biological resources and aesthetics found at or near the Airfield would have a very minimal cumulative impact to the small amount of development which already exists at the Airport.

3.13.2-2 Proposed Action

Under the Proposed Action Alternative, the YCAA would continue its contract with the BOR to operate and maintain Rolle Airfield. As such, the future proposed development as outlined in the 2015 Airport Master Plan may occur. New development at the airport may increase the likelihood of users at the Airfield. Potential impacts to the project vicinity that may occur due to the Avenue E project include the same potential disturbances to biological resources and aesthetics mentioned above. The Avenue E project still has the potential to displace wildlife in the project vicinity or project area. However, any new development project on the Airfield will be subject to an environmental review prior to any construction, thus impacts to any biological resources will be addressed at that time. The change in aesthetics to Rolle Airfield with the addition of a two-lane roadway may potentially affect users of the Airfield that future development may bring; however, given the industrial nature of the Airfield and its remote location, it is not anticipated that this would negatively affect any airport users. Should the Avenue E project be under construction at the same time as any new development at the Airfield, it is possible that some temporary construction impacts to air quality may occur in the project vicinity, such as fugitive dust. Overall, any cumulative impacts that may occur have the potential to more adversely have an effect on the Proposed Action Alternative than on the No Action Alternative, but do not appear to be unreasonable nor unmanageable in either instance.

3.13.3 Management and Mitigation Measures

For both the No-Action and Proposed Action alternatives, the management and mitigation measures as they pertain to aesthetics as outlined in Section 3.1.1, air quality as outlined in Section 3.2.3, and biological resources, in particular the FTHL, as outlined in Section 3.3.3, should be followed.

3.13.4 Best Management Practices

For both the No-Action and Proposed Action alternatives, the best management practices as they pertain to air quality in Section 3.2.4 and biological resources, in particular the FTHL, as outlined in Section 3.3.4, should be followed. There are no BMPs recommend for the cumulative impact of aesthetics.

Chapter 4 Consultation, Coordination, and Public Involvement

During the preparation of this EA, agency and public involvement efforts were conducted to inform stakeholders and the public about the Proposed Action and to obtain input on the proposed alternatives and environmental issues.

4.1 Consultation and Coordination

The Study Team conducted a project kick-off meeting on March 8, 2016, at the Yuma International Airport. The focus of the meeting was to review the findings of the Master Plan, discuss the scope of work, and create a schedule for deliverables. A copy of the meeting minutes is contained in **Appendix D**.

Scoping letters were sent to various interested stakeholders to inform and solicit information about the study. A list of stakeholders was provided to the consultant team by the BOR. A copy of the scoping letter, its attachments, and responses can be found in **Appendix D**.

4.2 Public Open House

One public open house was held during the 30-day public review period at the Yuma International Airport on March 23, 2017 from 5:00 to 7:00pm. A copy of sign-in sheet and presentation is contained in **Appendix D**. The purpose of the open house was to update the public regarding the study, present the findings of the Master Plan, and provide an opportunity for members of the public to ask questions and make comments.

Notice of the public open house was advertised on March 1, 2017 in:

- Yuma Sun

Notice of the open house was also uploaded to multiple social media outlets sponsored by YCAA. A description of the open house was provided after it occurred. No comments were received during the open house. A copy of the Affidavit of Publication is contained in **Appendix D**.

4.3 Comment Period

Agencies and members of the public were invited to review and comment on the Draft EA. The comment period lasted 30 days from March 1, 2017 to March 30, 2017.

The Draft EA was available for review on the Bureau of Reclamation's Yuma Office Internet webpage, which is located here: https://www.usbr.gov/lc/yuma/environmental_docs/environ_docs.html.

Copies of the Draft EA were also available at the following locations for the duration of the comment period:

Yuma International Airport
2191 E. 32nd Street, Suite 218
Yuma, AZ 85365
Phone: 928-726-5882

Yuma County Administrator's Office
2351 W. 26th Street
Yuma, AZ 85364
Phone: 928-373-1010

Yuma County Library, San Luis Branch
1075 N. 6th Ave.
San Luis, AZ 85349
Phone: 928-373-6492

Yuma County Main Library
2951 S 21st Drive
Yuma, AZ 85364
Phone: 928-782-1871

The BOR point of contact for any inquiries from the public was:

Mr. Julian DeSantiago
Environmental Planning and Compliance Office
Bureau of Reclamation Yuma Area Office
7301 Calle Agua Salada
Yuma, AZ 85364
Phone: 928-343-8259

4.4 Comments Received During Public Comment Period

Comments received during the review period are contained in **Appendix E.**

Chapter 5 List of Preparers

The following were major contributors in the preparation of this document:

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Chapter 6 References

Arizona Department of Agriculture. (2016). *Protected Native Plants by Categories*. Retrieved April 25, 2016, from Arizona Department of Agriculture: https://agriculture.az.gov/protected-native-plants-categories

Arizona Department of Environmental Quality [ADEQ]. (2016). *Air Qulaity Division - ADEQ Air Quality Monitoring Data*. Retrieved June 8, 2016, from Arizona Department of Environmental Quality [ADEQ]: http://airdata.azdeq.gov/AirVision/

Arizona Game and Fish Department. (2012, May 16). *Arizona's State Wildlife Action Plan*. Retrieved May 6, 2016, from Arizona Game and Fish Department: https://www.azgfd.com/PortalImages/files/wildlife/2012-2022_Arizona_State_Wildlife_Action_Plan.pdf

Arizona Game and Fish Department. (2016). *Arizona Game and Fish Department online environmental review tool*. Retrieved April 25, 2016, from Arizona Heritage Geographic Information System: http://azgfd.gov/hgis

Arizona Game and Fish Department. (2016). *Arizona Game and Fish Department species of concern list*. Retrieved April 25, 2016, from Heritage Data Management System : http://www.azgfd.gov/w_c/edits/species_concern.shtml

Arizona Game and Fish Department. (2016). *Arizona Heritage Geographic Information System*. Retrieved May 4, 2016, from Arizona Game and Fish Department: http://www.azgfd.gov/pdfs/w_c/hdms/Tortguidelines.pdf

Arizona Rare Plant Committee. (2000). *Arizona Rare Plant Field Guide*. Washington D.C. : U.S. Government Printing Office.

Arizona State Land Department. (2016). *GIS Arizona Parcel Viewer*. Retrieved July 2016, from Arizona State Land Department: http://gis.azland.gov/webapps/parcel/

BIA Division of Land Titles and Records. (2010, January 1). *American Indian Reservations and Other Indian Trust Lands*. Retrieved July 2016, from U.S. Department of the Interior - Bureau of Indian Affairs: http://www.bia.gov/cs/groups/mywcsp/documents/stillimage/idc012635.pdf

Brown, D. (1994). *Biotic Communities: Southwestern United States and Northwestern Mexico*. (D. Brown, Ed.) Salt Lake City: University of Utah Press.

California Partners in Flight. (2009). *CalPIF Desert Bird Conservation Plan Version 1.0*. Retrieved May 5, 2016, from California Partners in Flight: http://www.prbo.org/calpif/htmldocs/desert.htm

Clinton, W. (1999, February 3). *Executive Order 13112*. Retrieved June 2016, from U.S. Government Services Administration: http://www.gsa.gov/portal/content/101587

Corman, T., & Wise-Gervais, C. (Eds.). (2005). *Arizona Breeding Bird Atlas*. ALbuquerque: Univeristy of New Mexico Press.

Council on Environmental Quality. (1978, November 28). *CEQ Regulations for Implementing NEPA*. Retrieved July 2016, from NEPA.gov: https://ceq.doe.gov/ceq_regulations/Council_on_Environmental_Quality_Regulations.pdf

Council on Environmental Quality. (2016, August 1). *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. Retrieved November 7, 2016, from Council on Environmental Quality: https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf

Countess Environmental. (2006). *WRAP Fugitive Dust Handbook*. Westlake Village: Countess Environmental. Retrieved June 8, 2016, from http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

Eberle, G., & Steer, M. (1982). *Air Quality Procedures for Civilian Airports and Air Force Bases*. Washington D.C.: Federal Aviation Administration. Retrieved June 8, 2016, from http://www.dtic.mil/dtic/tr/fulltext/u2/a123890.pdf

EPG. (2007). *Environmental Assessment - Yuma TS-8 to San Luis 69kV Project*. Phoenix: EPG.

Federal Aviation Administration. (2006, July 21). *National Environmental Ploicy Act (NEPA) Implementing Instructioins for Airport Actions Order 5050.4B*. Retrieved June 2016, from Federal Aviation Administration : http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/media/5050-4B_complete.pdf

Federal Aviation Administration. (2015, July). *1050.1 Desk Reference*. Retrieved July 2016, from Federal Aviation Administration: https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/media/desk-ref.pdf

Federal Aviation Administration. (2015, July 16). *FAA Order 5010.1F Environmental Impacts: Policies and Procedures*. Retrieved June 2016, from Federal Aviation Adminstration: http://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf

Federal Emergency Management Agency. (2016). *FEMA Flood Map Service Center*. Retrieved July 2016, from Federal Emergency Management Agency: https://msc.fema.gov/portal/

Flat-tailed Horned Lizard Interagency Coordinating Committee. (2003 , May). *Flat-tailed Horned Lizard Rangewide Management Strategy, 2003 revision*. Retrieved April 25, 2016, from U.S. Fish and Wildlife Service: https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/FTHL/RMS%20-%20Final%202003.pdf

IPCC Working Group I . (2016, January 29). *Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of IPCC*. Retrieved April 20, 2016, from Intergovermental Panel on Climate Change: htpp://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf

Morrison-Maierle. (2015). *Rolle Field Airport Master Plan - Final Report*. Phoenix: Morrison-Maierle, Inc. Retrieved June 2016, from http://www.rollefield.com/

Psomas. (2015). *Final Design Concept Report - Avenue E, SR 195 to County 18th Street*. Tucson: Psomas. Retrieved February 2017

Soil Survey Staff. (2016). *Web Soil Survey*. Retrieved July 2016, from U.S. Department of Agriculture, Natural Resources Conservation Service: http://websoilsurvey.nrcs.usda.gov/

South Coast Air Quality Management District. (2007a). *EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles)*. Retrieved June 8, 2016, from South Coast Air Quality Management District:

http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road)

South Coast Air Quality Management District. (2007b). *Off-Road - Model Mobile Source Emission Factors*. Retrieved June 8, 2016, from South Coast Air Quality Management District: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors

State of Arizona. (2013, September 30). *Arizona Administrative Code, Title 18 Environmental Qualitity, Chapter 2 Department of Environmental Quality Air Pollution Control*. Retrieved June 2016, from Arizona Secretary of State: http://apps.azsos.gov/public_services/Title_18/18-02.pdf

SWCA Environmental Consultants. (2016). *Air Quality Report for Yuma Rolle Airfield*. Phoenix: SWCA Environmental Consultants.

SWCA Environmental Consultants. (2016). *Archaeological Survey of 131.0 Acres for the Proposed Rolle Airfield Improvements Project in Yuma County, Arizona*. Phoenix: SWCA Environmental Consultants.

The Arizona Geological Survey. (2012). *Arizona's Geologic Hazard Center - Earthquakes*. Retrieved July 2016, from The Arizona Geological Survey: http://www.azgs.az.gov/hazards_earthquakes.shtml

Thompson, S. (2004). *Gateway to combat: A historic context for military aviation training on the Barry M. Goldwater Range East, Arizona, World War II and early Cold War eras*. Tucson: Statistical Research Inc. .

Towne, D., & Yu, W. K. (1998). *Ambient groundwater quality of the Yuma Basin: A 1995 basline study*. Phoenix: Arizona Department of Environmental Quality, Water Quality Division. Retrieved July 2016, from http://legacy.azdeq.gov/environ/water/assessment/download/yuma.pdf

U.S. Bureau of Reclamation. (2016, June 16). *Reclamation Manual Policy - Indian Policy of the Bureau of Reclamation* . Retrieved July 2016, from U.S. Bureau of Reclamation.

U.S. Census Bureau. (2010, April 1). *San Luis City, Arizona*. Retrieved July 2016, from U.S. Census Bureau Quick Facts: http://www.census.gov/quickfacts/table/PST045215/0463470,04027

U.S. Census Bureau. (2015, July 1). *Yuma County, Arizona*. Retrieved July 2016, from U.S. Census Bureau Quick Facts: http://www.census.gov/quickfacts/table/PST045215/04027,0463470

U.S. Climate Data. (2016). *Climate Yuma - Arizona*. Retrieved April 25, 2016, from U.S. Climate Data: http://www.usclimatedata.com/climate/yuma/arizona/united-states/usaz0275

U.S. Department of Labor, Occupational Safety and Health Administration. (n.d.). All ABout OSHA. Washington, District of Columbia, USA. Retrieved July 2016, from U.S. Department of Labor, Occupational Safety and Health Administration: https://www.osha.gov/Publications/all_about_OSHA.pdf

U.S. Department of the Interior . (2016). *Arizona Parks*. Retrieved June 5, 2016, from National Park Service: https://www.nps.gov/state/az/index.htm

U.S. Enviromental Protection Agency. (2016b, June 10). *De Minimis Emission Levels*. Retrieved from U.S. Environmental Protection Agency: https://www.epa.gov/general-conformity/de-minimis-emission-levels

U.S. Environmental Protection Agency. (2006, November). *AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, Unpaved Roads*. Retrieved June 3, 2016, from U.S. Environmental Protection Agency: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

U.S. Environmental Protection Agency. (2011, January). *AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, Paved Roads*. Retrieved June 3, 2016, from U.S. Environmental Protection Agency: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

U.S. Environmental Protection Agency. (2015, November 16). *Summary of Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Retrieved July 2016, from U.S. Environmental Protection Agency: https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

U.S. Environmental Protection Agency. (2016a, March 29). *NAAQS Table*. Retrieved April 11, 2016, from U.S. Environmental Protection Agency: https://www.epa.gov/criteria-air-pollutants/naaqs-table

U.S. Environmental Protection Agency. (2016c, March 9). *Air Emissions Inventories - 2011 National Emissions Inventory (NEI) Data*. Retrieved June 10, 2016, from U.S. Environmental Protection Agency: https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data

U.S. Fish and Wildlife Service. (2016). *List of threatened and endangered species*. Retrieved April 25, 2016, from U.S. Fish and Wildlife Service Informatioin for Planning and Conservation (IPaC) : http://ecos.fws.gov/ipac/

U.S. Fish and Wildlife Service. (2016). *National Wetlands Inventory - V2*. Retrieved July 2016, from U.S. Fish and Wildlife Service: https://www.fws.gov/wetlands/Data/Mapper.html

U.S. Geological Survey. (2016). *Mineral Resources On-Line Spatial Data*. Retrieved July 2016, from U.S. Geological Survey: http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=AZQ;0

U.S. Government Publishing Office. (2016, August 8). Electronic Code of Federal Regulations Title 40, Chapter I, Subchapter C, Part 98 Mandatory Greenhouse Gas Reporting. Washington D.C., United States. Retrieved June 2016, from http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl

Yuma County Board of Supervisors. (2005, August 1). *Yuma County Board of Supervisors Ordinance No. 05-01*. Retrieved June 15, 2016, from Yuma County Arizona: http://www.yumacountyaz.gov/home/showdocument?id=1113

Yuma County Chamber of Commerce. (2015). *Yuma County Demographics*. Retrieved July 2016, from Yuma County Chamber of Commerce: http://www.yumachamber.org/demographics.html

APPENDICES

Appendix A

U.S. Fish and Wildlife Service IPaC Trust Resources Report

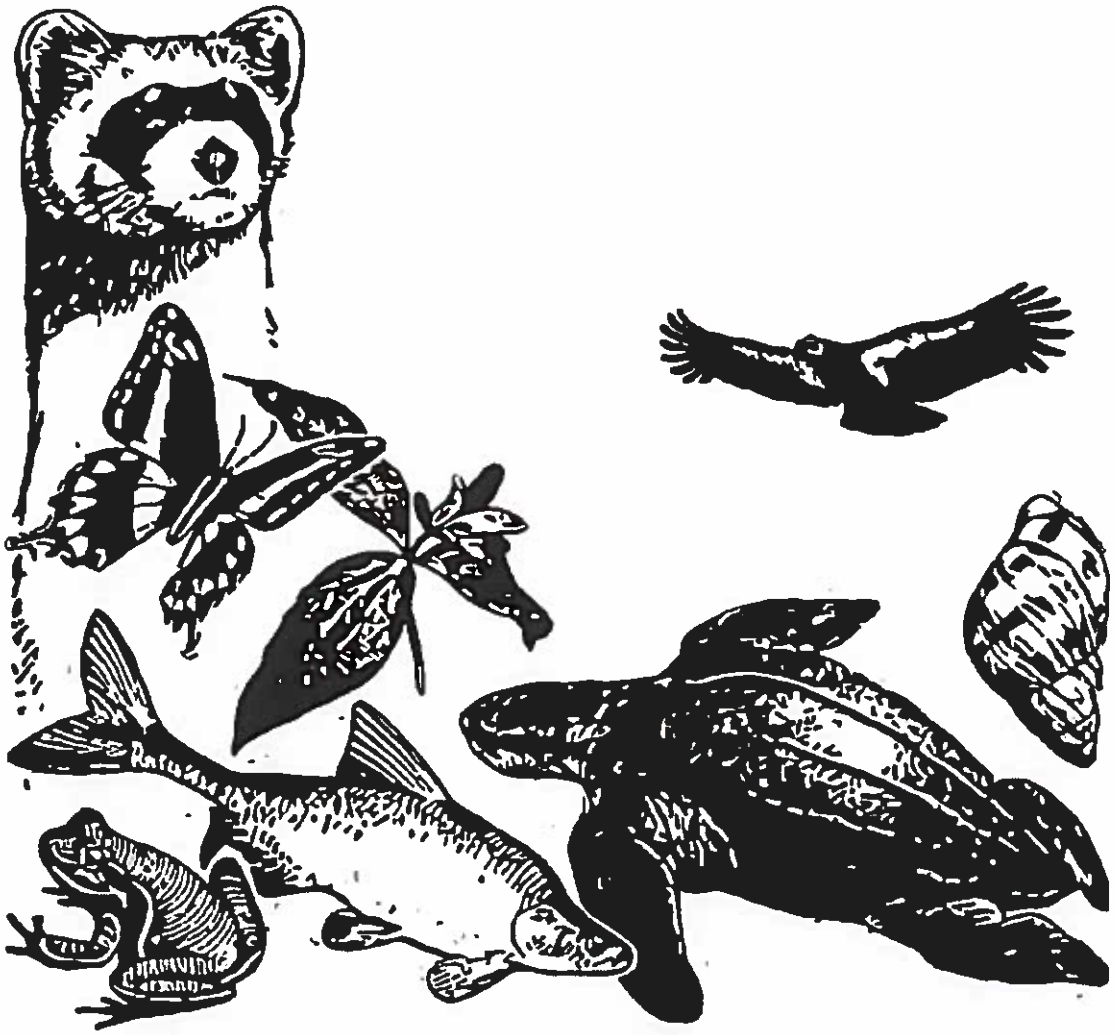
U.S. Fish & Wildlife Service

Rolle Airport Expansion

IPaC Trust Resources Report

Generated April 25, 2016 12:57 PM MDT, IPaC v3.0.2

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 (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

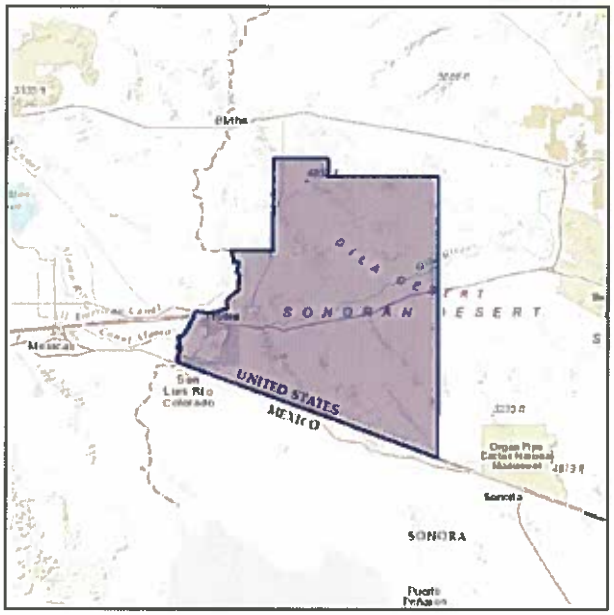
Rolle Airport Expansion

LOCATION

Yuma County, Arizona

IPAC LINK

https://ecos.fws.gov/ipac/project/S27K7-22QPN-HABMN-KJQWB-NIINHY



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

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 USFWS 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 either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Southwestern Willow Flycatcher Empidonax traillii extimus — Endangered

MANAGED BY
Arizona Ecological Services Field Office
Carlsbad Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B094

Yellow-billed Cuckoo Coccyzus americanus — Threatened

MANAGED BY
Arizona Ecological Services Field Office

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R

Yuma Clapper Rail Rallus longirostris yumanensis — Endangered

MANAGED BY
Arizona Ecological Services Field Office
Carlsbad Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B00P

Fishes

Bonytail Chub Gila elegans — Endangered

MANAGED BY
Arizona Ecological Services Field Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E020

Razorback Sucker Xyrauchen texanus — Endangered

MANAGED BY
Arizona Ecological Services Field Office
Carlsbad Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E054

Mammals

Lesser Long-nosed Bat Leptonycteris curasoae yerbabuenae — Endangered

MANAGED BY
Arizona Ecological Services Field Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0AD

Sonoran Pronghorn Antilocapra americana sonoriensis — Endangered

MANAGED BY
Arizona Ecological Services Field Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A009

Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

Razorback Sucker Xyrauchen texanus

Final designated critical habitat
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E054#crithab

Yellow-billed Cuckoo Coccyzus americanus

Proposed critical habitat
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & 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.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JX

Bendire's Thrasher Toxostoma bendirei — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IF

Black Rail Laterallus jamaicensis — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09A

Black-chinned Sparrow Spizella atrogularis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IR

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Cactus Wren Campylorhynchus brunneicapillus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FZ

Common Black-hawk Buteogallus anthracinus — Bird of conservation concern
Season: Breeding

Costa's Hummingbird Calypte costae — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JE

Elf Owl Micrathene whitneyi — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GV

Gila Woodpecker Melanerpes uropygialis — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EH

Gilded Flicker Colaptes chrysoides — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EG

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Green-tailed Towhee Pipilo chlorurus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IO

Lawrence's Goldfinch Carduelis lawrencei — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J8

Le Conte's Thrasher toxostoma lecontei — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GE

Least Bittern Ixobrychus exilis
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B092

Lesser Yellowlegs Tringa flavipes — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MD

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Lucy's Warbler Vermivora luciae — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DL

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Prairie Falcon Falco mexicanus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ER

Sage Thrasher Oreoscoptes montanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ID

Sandwich Tern Thalasseus sandvicensis — Bird of conservation concern
Season: Breeding

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Sonoran Yellow Warbler Dendroica petechia ssp. sonorana — Bird of conservation concern

Seasons: Migrating, Wintering

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F7

Varied Bunting Passerina versicolor — Bird of conservation concern

Season: Breeding

Western Grebe aechmophorus occidentalis — Bird of conservation concern

Season: Breeding

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Wildlife refuges and fish hatcheries

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.

This location overlaps all or part of the following National Wildlife Refuges:

Cabeza Prieta National Wildlife Refuge — 1,711,044.23 acres

PHONE (520) 387-6483

ADDRESS
1611 North Second Avenue
Ajo, AZ 85321

http://www.fws.gov/refuges/profiles/index.cfm?id=22571

Imperial National Wildlife Refuge — 40,283.73 acres

PHONE (928) 783-3371

ADDRESS
12812 N Wildlife Way
Yuma, AZ 85365

http://www.fws.gov/refuges/profiles/index.cfm?id=22560

Kofa National Wildlife Refuge — 1,328,697.49 acres

PHONE (928) 783-7861

ADDRESS
9300 E. 28th Street
Yuma, AZ 85365

http://www.fws.gov/refuges/profiles/index.cfm?id=22570

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.

Wetland data is unavailable at this time.

Appendix B

Arizona Game and Fish Department HDMS Report

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:
Rolle Airport Expansion

Project Description:
Airport expansion

Project Type:
Transportation & Infrastructure, Airports, Construction of new runways, terminals/concourses, other facilities

Contact Person:
Jeff Johnson

Organization:
SWCA Environmental Consultants

On Behalf Of:
BOR

Project ID:
HGIS-03481

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

Rolle Airport Expansion

Aerial Image Basemap With Locator Map

Project Boundary

Buffered Project Boundary

Project Size (acres): 187.08

Lat/Long (DD): 32.5169 / -114.6953

County(s): Yuma

AGFD Region(s): Yuma

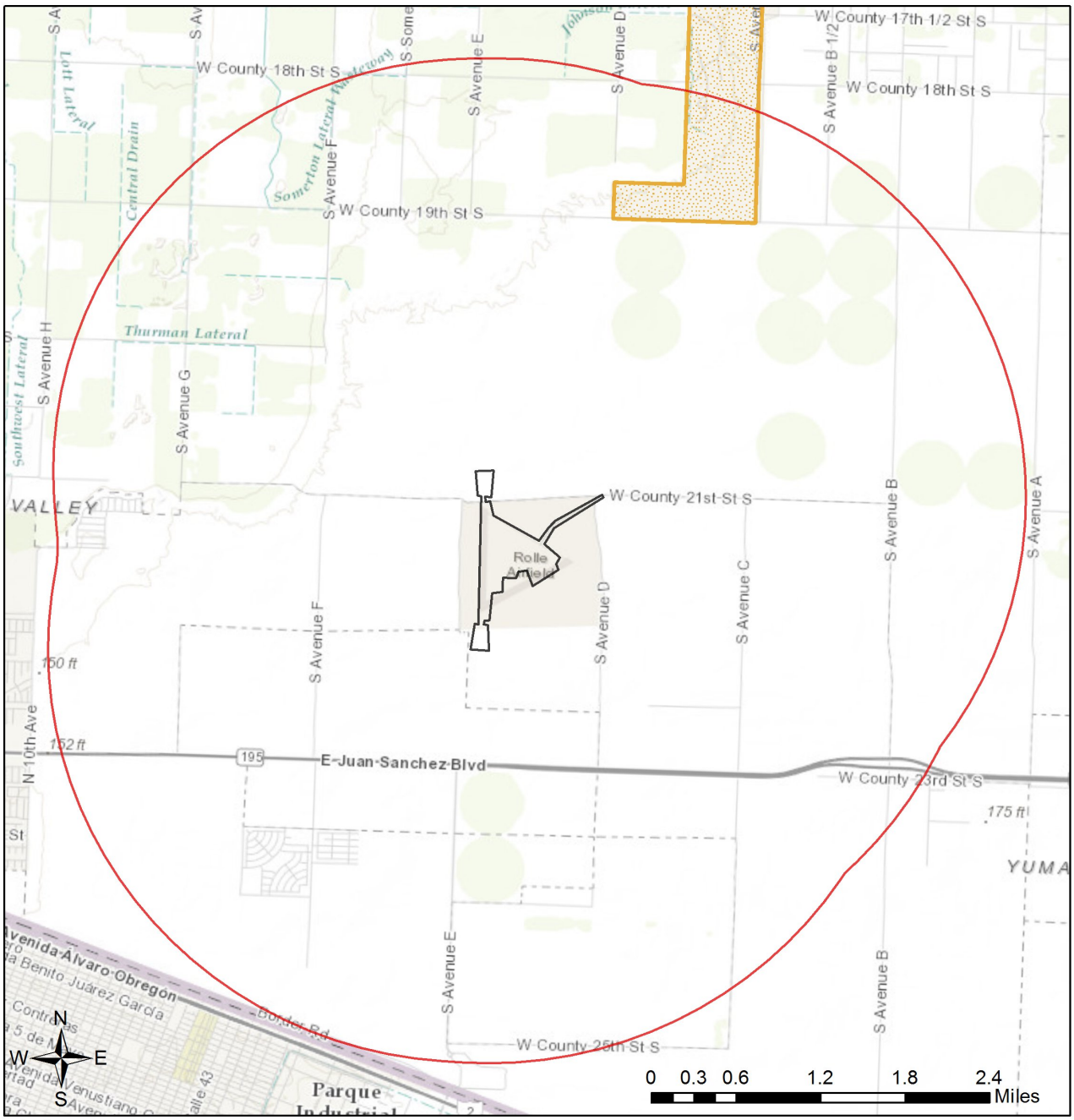
Township/Range(s): T10S, R24W; T11S, R24W

USGS Quad(s): SOMERTON

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),

Rolle Airport Expansion

Web Map As Submitted By User



- Project Boundary
- Buffered Project Boundary
- Critical Habitat
- Important Bird Areas
- Special Areas
- Tribal Lands

Project Size (acres): 187.08

Lat/Long (DD): 32.5169 / -114.6953

County(s): Yuma

AGFD Region(s): Yuma

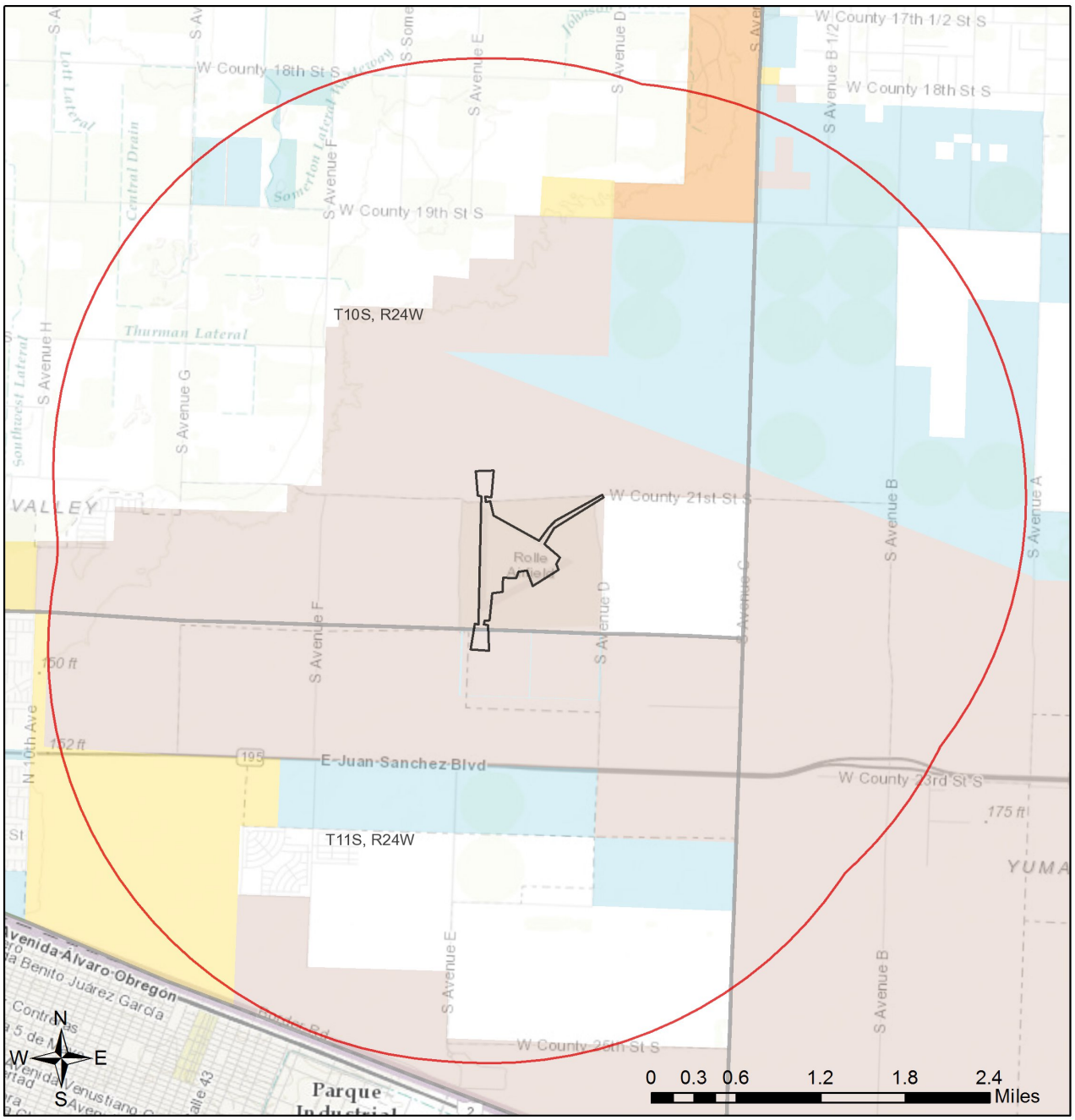
Township/Range(s): T10S, R24W; T11S, R24W

USGS Quad(s): SOMERTON

Sources: Esri, HERE, DeLorme, 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

Rolle Airport Expansion

Topo Basemap With Township/Ranges and Land Ownership



Project Boundary	Mixed/Other	Project Size (acres): 187.08
Buffered Project Boundary	National Park/Mon.	Lat/Long (DD): 32.5169 / -114.6953
Township/Ranges	Private	County(s): Yuma
AZ Game and Fish Dept.	State and Regional Parks	AGFD Region(s): Yuma
BLM	State Trust	Township/Range(s): T10S, R24W; T11S, R24W
BOR	US Forest Service	USGS Quad(s): SOMERTON
Indian Res.	Wildlife Area/Refuge	
Military		

Sources: Esri, HERE, DeLorme, 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	NPL	SGCN
Cocopah Indian Reservation	Cocopah Indian Reservation					
Pholisma sonorae	Sand Food	SC		S	HS	
Phrynosoma mcallii	Flat-tailed Horned Lizard	CCA				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	NPL	SGCN
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Anthus spragueii	Sprague's Pipit	C*				1A
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Charadrius montanus	Mountain Plover	SC				1B
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S			1A
Colaptes chrysoides	Gilded Flicker			S		1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Gopherus morafkai	Sonoran Desert Tortoise	C*	S			1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Macrotus californicus	California Leaf-nosed Bat	SC		S		1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolnii	Lincoln's Sparrow					1B
Melozone aberti	Abert's Towhee		S			1B
Myotis occultus	Arizona Myotis	SC		S		1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Passerculus sandwichensis	Savannah Sparrow					1B
Perognathus longimembris	Little Pocket Mouse					1B
Phrynosoma goodei	Goode's Horned Lizard					1B
Phrynosoma mcallii	Flat-tailed Horned Lizard	SC				1A
Rallus longirostris yumanensis	Yuma Clapper Rail	LE				1A
Sigmodon hispidus eremicus	Yuma Hispid Cotton Rat	SC				1B
Toxostoma lecontei	Le Conte's Thrasher					1B
Troglodytes pacificus	Pacific Wren					1B
Vulpes macrotis	Kit Fox					1B

Species of Economic and Recreation Importance Predicted within Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Phasianus colchicus	Ring-necked Pheasant					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning 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 native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/environmental-services/np1

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
2321 W. Royal Palm Rd, Suite 103
Phoenix, AZ 85021
Phone: 602-242-0210
Fax: 602-242-2513

Tucson Sub-Office
201 N. Bonita Suite 141
Tucson, AZ 85745
Phone: 520-670-6144
Fax: 520-670-6155

Flagstaff Sub-Office
SW Forest Science Complex
2500 S. Pine Knoll Dr.
Flagstaff, AZ 86001
Phone: 928-556-2157
Fax: 928-556-2121

Tribal Lands are within the vicinity of your project area and may require further coordination. Please contact:
Cocopah Tribal Council
County 15th & Avenue G
Somerton, AZ 85350
(928) 627-2061
(928) 627-1617 (fax)

Appendix C

Archeological Survey of the Proposed Project Area

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Archaeological Survey of 131.0 Acres for the Proposed Rolle Airfield Improvements Project in Yuma County, Arizona

Prepared for

Armstrong Consultants, Inc.

For submittal to

Yuma County Airport Authority

Prepared by

SWCA Environmental Consultants

May 2016

ARCHAEOLOGICAL SURVEY OF 131.0 ACRES FOR THE PROPOSED ROLLE AIRFIELD IMPROVEMENTS PROJECT IN YUMA COUNTY, ARIZONA

Prepared for

Armstrong Consultants, Inc.
2345 South Alma School Road, Suite 208
Mesa, Arizona 85210
Attn: Charlie McDermott

For Submittal to
Yuma County Airport Authority
2191 East 32nd Street, Suite 218
Yuma, Arizona 85365

Prepared by

David M. R. Barr, M.A.

SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520) 325-9194
www.swca.com

Archaeological Resources Protection Act Permit No. LC-AZ-16-05

SWCA Project No. 34571

SWCA Cultural Resources Report No. 16-228

May 2016

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM
SURVEY REPORT ABSTRACT

Report Title: Archaeological Survey of 131.0 Acres for the Proposed Rolle Airfield Improvements Project in Yuma County, Arizona

Project Name: Rolle Airfield Environmental Assessment

Project Location: San Luis, Yuma County, Arizona

Project Locator UTM: NAD 83 Zone 11 716462 mE 3600003 mN

Project Sponsor: Arizona Department of Transportation (ADOT); Yuma County Airport Authority (YCAA)

Sponsor Project Number(s): N/A

Lead Agency: ADOT

Agency Project Name/Number: ADOT No. E5S27

Other Involved Agencies: U.S. Bureau of Reclamation (Reclamation); Federal Aviation Administration (FAA)

Applicable Regulations: Section 106 of the National Preservation Act; State Historic Preservation Act

Funding Source: State and County

ASLD ROW Application Number: N/A

Description of the Project/Undertaking: ADOT and YCAA are proposing improvements to the Rolle Airfield in southwestern Yuma County, Arizona. The proposed improvements will be developed in a logical and phased manner over a 20-year period consistent with the airport layout plan. Proposed improvements include: extending and paving the existing Runway 17-35; constructing a parallel taxiway to Runway 17-35; installing airfield lighting and visual approach aids, aircraft parking apron/tie-downs, and aircraft storage hangers; constructing a general aviation terminal; upgrading existing airport access roads and vehicle parking; extending the existing perimeter fencing; installing fuel facilities; installing fire suppression systems; establishing fiber optics/telecommunications to the Yuma International Airport; upgrading the helicopter landing area; and constructing an unmanned aerial vehicle launch and recovery site. SWCA Environmental Consultants (SWCA) was subcontracted by Armstrong Consultants, Inc., to conduct an archaeological survey of the proposed project areas to assess the proposed long-term undertakings' effects on historic properties. SWCA conducted the survey to aid ADOT and YCAA in complying with their responsibilities under the State Historic Preservation Act and to aid Reclamation and FAA in complying with Section 106 of the National Historic Preservation Act.

Project Area/Area of Potential Effects (APE): The APE for the specific proposed improvement projects will vary depending on the stage of development, but all will be contained entirely within the APE considered for this archaeological investigation. All ground-disturbing activities will be confined to the 131.0-acre surveyed area.

Legal Description: The project area is located in Sections 25–26 and 34–35, Township 10 South, Range 24 West; and Section 2, Township 11 South, Range 24 West; Yuma County, Gila and Salt River Baseline and Meridian, as found on the U.S. Geological Survey Somerton, Arizona, 7.5-minute quadrangle.

Land Jurisdiction(s): Reclamation

Total Acres: 131.0 acres

Acres Surveyed: 131.0 acres

Acres Not Surveyed: N/A

Consultant Firm/Organization: SWCA Environmental Consultants

Project Number: 34571

Permit Number(s): Archaeological Resources Protection Act Permit No. LC-AZ-16-05

ASM Accession No.: N/A

Date(s) of Fieldwork: April 11–12, 2016

Number of IOs Recorded: 8

Number of Sites Recorded: One (AZ X:6:135[ASM])

Eligible Sites: None

Ineligible Sites: One

Unevaluated Sites: N/A

Sites Not Relocated: N/A

Site Summary Table

Land Jurisdiction	Identification Status (newly or previously recorded)	Site Number/ Property Address	NRHP Eligibility Status/ Criterion/Criteria	Recommended Treatment
U.S. Bureau of Reclamation	Newly recorded	AZ X:6:135(ASM) / Aux No. 4	Ineligible	No further work

Comments:

An archaeological survey of the project area resulted in the identification of one newly recorded site (AZ X:6:135[ASM]) and eight isolated occurrences (IOs). AZ X:6:135(ASM) is a historic manifestation that consists of the remnants of Auxiliary Airfield No. 4, constructed in 1942. The eight IOs consist of three historical metal cans, two brown glass bottle breaks, and three prehistoric ceramic scatters

representing pot breaks. The IOs are ineligible for listing in the Arizona or National Register of Historic Places (ARHP/NRHP).

AZ X:6:135(ASM), Aux No. 4, is one of seven auxiliary (Aux) airfields constructed during World War II (WWII) near the Yuma Army Airfield. Although Aux No. 4 is recognizable with respect to its former role as a WWII airstrip, alterations beginning in 1976 have included modifications of the runway surfaces, construction of a parking lot/tie-down area, and erection of a small hanger, which have resulted in a loss of some of the integrity of design, materials, and workmanship of the WWII period (1942–1945) airfield. Of the seven Aux fields associated with Yuma Airfield (Aux 1–4 in Yuma; Aux 5 in Wellton, Aux 6 in Colfred, and Aux 7 in Stoval), only Colfred and Stoval are fairly intact. At Colfred, the runways and taxilane have been lightly resurfaced and some buildings have been built on the apron. At Stoval (AZ Y:6:34[ASM]) (which was recommended eligible to the NRHP by Bruder et al. [1996], Davis et al. [2006], and Slaughter et al. [2000], and determined eligible by the State Historic Preservation Office [SHPO] in 2008), one runway has been lightly resurfaced. The Wellton Aux has not been resurfaced, but part of the taxiway is under cultivation. The resurfacing at Colfred and Stoval are very minor compared to that at Aux 2 and 4 in Yuma. Other recommended NRHP-eligible Aux fields on the Barry M. Goldwater Range (BMGR) include Luke 7–11, which are similar in triangular configuration, but have three runways.

SWCA recommends AZ X:6:135(ASM) as ineligible for listing on the ARHP/NRHP based on the existence of other auxiliary airfields on BMGR in original condition and already determined NRHP eligible by the Department of Defense and the Arizona SHPO. All of these auxiliary airfields exhibit standard design and construction techniques for U.S. Army Air Force installations of WWII. Construction and use of Aux No. 4 in its WWII context is sufficiently documented and other similar facilities on BMGR are better preserved and available for further study (Thompson 2004).

SWCA recommends this project will have No Adverse Effect on historic properties. However, if previously undocumented buried cultural resources are identified during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery until a qualified archaeologist has documented the discovery and evaluated its eligibility for the Arizona or National Register of Historic Places, as appropriate, and Tribes have been consulted, as appropriate. Work must not resume in this area without approval of the lead agency.

If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery. The Arizona State Museum, lead agency, SHPO, and appropriate Tribes must be notified of the discovery within 24 hours (following ASM and/or agency protocol). All discoveries will be treated in accordance with Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 United States Code 3001–3013) and work must not resume in this area without proper authorization from ASM and the lead agency.

PROJECT DESCRIPTION

The Arizona Department of Transportation (ADOT) and Yuma County Airport Authority (YCAA) are proposing improvements to the Rolle Airfield in southwestern Yuma County, Arizona. The proposed improvements will be developed in a logical and phased manner over a 20-year period consistent with the airport layout plan. Proposed improvements include: extending and paving the existing Runway 17-35; constructing a parallel taxiway to Runway 17-35; installing airfield lighting and visual approach aids, aircraft parking apron/tie-downs, and aircraft storage hangers; constructing a general aviation terminal; upgrading existing airport access roads and vehicle parking; extending the existing perimeter fencing; installing fuel facilities; installing fire suppression systems; establishing fiber optics/telecommunications to the Yuma International Airport; upgrading the helicopter landing area; and constructing an unmanned aerial vehicle launch and recovery site. SWCA Environmental Consultants (SWCA) was subcontracted by Armstrong Consultants, Inc., to conduct an archaeological survey of the proposed project areas to assess the proposed long-term undertakings' effects on historic properties. SWCA conducted the survey to aid ADOT and YCAA in complying with their responsibilities under the State Historic Preservation Act and to aid the U.S. Bureau of Reclamation (Reclamation) and the Federal Aviation Administration (FAA) in complying with Section 106 of the National Historic Preservation Act.

The area of potential effects (APE) for the specific proposed improvement projects will vary depending on the stage of development, but all will be contained entirely within the APE considered for this archaeological investigation. All ground-disturbing activities will be confined to the 131.0-acre surveyed area.

PROJECT LOCATION

The project is located approximately 5.4 miles south of the town of Somerton and approximately 3 miles north of the United States–Mexico border, in Yuma County, Arizona (Figure 1). The project area is located in Sections 25–26 and 34–35, Township 10 South, Range 24 West; and Section 2, Township 11 South, Range 24 West, Yuma County, Gila and Salt River Baseline and Meridian, as found on the U.S. Geological Survey (USGS) Somerton, Arizona, 7.5-minute quadrangle (Figure 2).

PREVIOUS RESEARCH

Archaeological Records Search

Before fieldwork, SWCA consulted the AZSITE database to identify previously conducted surveys and previously recorded sites in the project area and within a 1-mile radius of the project area.

The records search showed that six archaeological projects have been conducted in or within 1 mile of the project area (Table 1, Appendix A). These surveys were long, linear surveys associated with transmission lines, transportation, and agricultural infrastructure projects. None of these surveys has overlapped with the current project area.

No archaeological sites have been documented in or within a 1-mile radius of the project area.

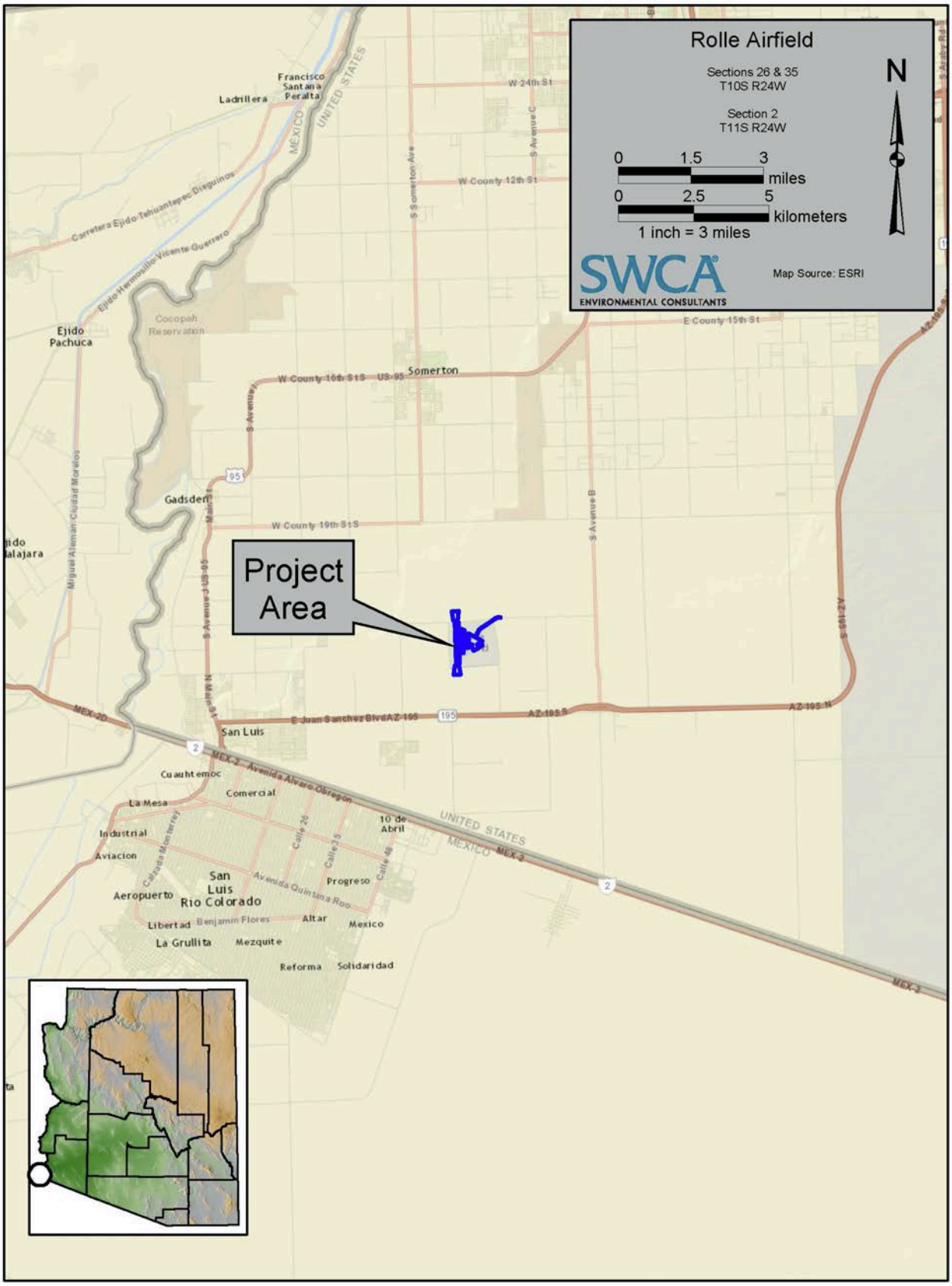


Figure 1. Project vicinity.

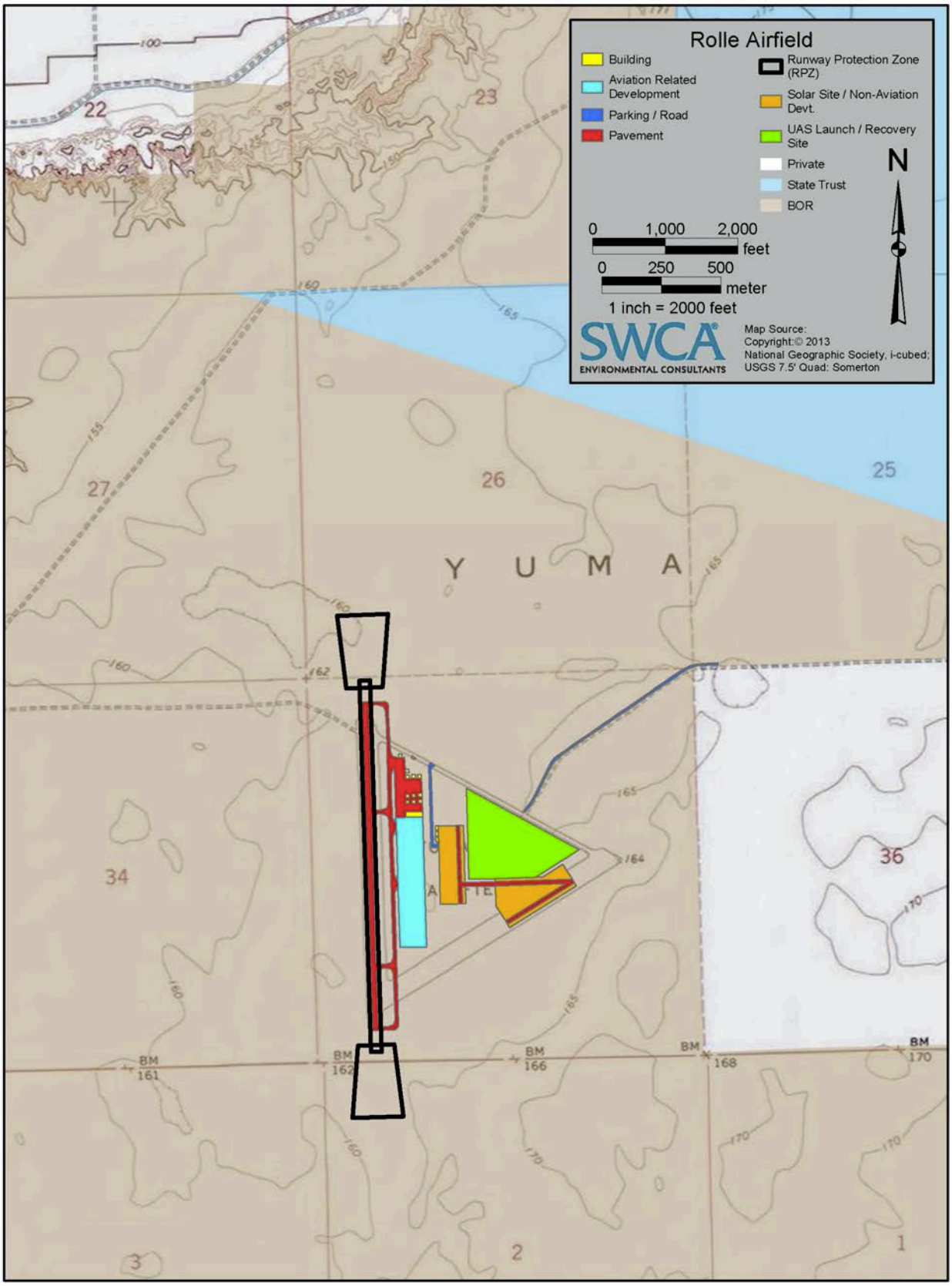


Figure 2. Project location.

Table 1. Previously Conducted Archaeological Surveys within a 1-Mile Radius of the Project Area

Agency Number	Project Name	Report Reference
1985-193.ASM	12kV Transmission Line near Yuma	Effland (1985)
1992-262.ASM	Yuma Lateral Expansion	McQuestion et al. (1992)
1997-82.ASM/BLM-320-1996-018	San Luis and I-8 to Yuma (YMPO)	Lite (1997)
2000-711.ASM/SHPO-2001-1950	Yuma Metropolitan Planning Organization	Courtright (2001)
2003-267.ASM	Yuma Area Service Highway	Morrison (2002)
2007-569.ASM	Yuma TS-8 to San Luis Project	Rowe (2007)

National Register of Historic Places–Listed Properties

The National Park Service's National Register of Historic Places (NRHP) database was searched to identify properties listed in the NRHP that are located in or within 1 mile of the project area. No NRHP-listed properties were identified within the search area.

Historical Map Research

Historical maps were also consulted to identify historic-era properties that were present, and may still be present, in the search area.

The General Land Office (GLO) map of Township 10 South, Range 24 West, filed in 1875, does not show any cultural features in the immediate vicinity of the project area, such as historical structures, farm fields, ranches, roads, or other facilities.

The GLO maps for Township 11 South, Range 24 West, filed in 1909 and 1922, do not show any cultural features in the immediate vicinity of the project area, such as historical structures, farm fields, ranches, roads, or other facilities.

In addition, the 1903 and 1905 USGS California–Arizona–Yuma, 30-minute map was examined. No cultural features were depicted in the immediate vicinity of the project area. The 1940 USGS Yuma, Arizona, 15-minute map did not depict any cultural features. The 1955 California–El Centro, 1 × 2–degree map was examined and depicted the YUMA AUX #4 AIRFIELD within the survey area. This airfield was also depicted on the 1965 USGS Somerton, Arizona, 7.5-minute quadrangle. Portions of this airfield are still in use today.

PHYSIOGRAPHIC CONTEXT

The project area is located in the southwestern portion of the Yuma Desert on a relatively flat surface. The project area is located on a Quaternary surficial deposit that consists of unconsolidated to strongly consolidated alluvial and aeolian deposits (Arizona Geological Survey 2015). This unit includes coarse, poorly sorted alluvial fan and terrace deposits on middle and upper piedmonts and along large drainages. Surface sediments are tannish brown sand and silt. The project area elevation ranges between 162 and 165 feet above mean sea level (amsl).

The project area lies within the Lower Colorado Sonoran Desertscrub biotic community, as described by Brown (1994). Vegetation is spare and commonly observed plant species included creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and big galleta grass (*Pleuraphis rigida*) (Figures 3 and 4).

Figure 3. Overview of project area; view facing north.

Figure 4. Overview of project area; view facing south.

CULTURE HISTORY

The culture history of the Colorado Desert is one of the most poorly understood in the greater American Southwest. The lack of stratified, excavated sites that have produced datable material is a primary deterrent. Other problems include 1) a general lack of careful, long-term research (compared with other regions of the American Southwest); 2) a lack of cross-dated artifacts that have been found in primary context; 3) the fact that most recorded sites are surface manifestations; 4) the fact that the relative dearth of scientific work has left behind a somewhat confusing assignment of names and dates to various cultural manifestations; and 5) the fact that the lack of elaborate pueblos or platform-mound sites, the hallmarks of much of the greater Southwest, seems to have made the area relatively unattractive to Southwestern archaeologists. It should be noted that, in the strictest sense, this region is not encompassed solely by Southwestern cultural traditions; influences from the Great Basin, the western Mojave Desert, and the southern California coast are evident as well (Ezzo 1994; Ezzo and Altschul 1994).

Nevertheless, a number of researchers have investigated the region and developed ideas about human adaptations in antiquity. Differing cultural sequences have been proposed for the various desert cultures that occupied this area. Important, early cultural historical research in the area was conducted by Malcolm Rogers (1936, 1966). Other chronologies for the region have been proposed by Warren and Crabtree (1986), Campbell and Campbell (1935), Colton (1958), Waters (1982), and Warren (1984).

This section provides a means to put the study area in appropriate historic context. For a more detailed chronology of the region, the reader is referred to Rogers (1936, 1939, 1945), Campbell and Campbell (1935), Ezzo (1994), Forbes (1965), McGuire and Schiffer (1982), Stone (1986, 1991), and Warren (1984).

Drawing on the work of the above authors, the following culture history is divided into five periods, based primarily on changes in technology and adaptation. The periods include 1) pre-Paleoindian (pre-12,000 B.P.); 2) Paleoindian (12,000–7000 B.P.); 3) Archaic (7000 B.P.–A.D. 500); 4) Formative (A.D. 500–1539); and 5) Historic (A.D. 1539–1950). An ethnographic overview is also included.

Pre-Paleoindian Period

Evidence for a pre-Paleoindian occupation of the New World—that is, a cultural tradition that predates the Clovis culture—continues to be controversial. As Haynes (1980) has cogently pointed out, the criteria for a pre-Clovis cultural manifestation in the New World must include 1) artifacts that are unquestionably of human origin; 2) artifacts that are clearly defined within a geological stratum of known or approximately known age; and 3) artifacts that are in direct association with datable material that yields a pre-Clovis age. Sites that have been purported to be of pre-Clovis antiquity—Calico Hills, California (Moratto 1984), Meadowcroft Rockshelter, Pennsylvania (Adovasio et al. 1980), and the El Pacaicasa phase of the Ayacucho Valley, Peru (MacNeish et al. 1980)—fail to meet these criteria adequately.

In the Colorado Desert, Hayden (1976) has defined a pre-Clovis horizon, the Malpais phase, which he claims predates the San Dieguito complex, which is Paleoindian in age. Hayden (1976) based this primarily on the degree of desert varnish that has accumulated on the flaked surfaces of chipped stone. He obtained dates that range from 17,000 to 26,000 years before present (B.P.), but, unfortunately, these dates derive from the use of cation-ratio dating (Dorn 1983), which has since been proven to lack rigorous scientific merit (cf. Harry 1992). Another problem with the Malpais phase is that it lacks diagnostic artifacts that are distinctive of this tradition; choppers are prominent, but they are likewise prominent in a number of later assemblages as well. In summary, there is no convincing evidence for a pre-Paleoindian adaptation in the Colorado Desert.

Paleoindian Period

The Paleoindian period in this region is characterized by the San Dieguito complex. Provisionally dated at 12,000 to 7000 B.P., this complex, defined by Rogers (1929), has been considered to be represented by most of the aceramic assemblages in the region (Rogers 1966). Rogers initially defined the complex from surface finds, but he later refined it with material excavated from the C. W. Harris site, which is located near the Pacific Ocean on the San Dieguito River (Rogers 1939, 1966). Based on data from this site, Rogers (1939, 1958) divided the complex into three periods, which he originally termed Malpais, Playa I, and Playa II, but subsequently renamed San Dieguito I–III. The phase distinctions, which Rogers applied to the Colorado and Mojave Deserts and the western Great Basin, were based on increasingly more sophisticated tool types.

One of the problems with the phase assignment is that there are no sites yet identified in which all three phases are represented (Ezzo 1994). One possible reason is that changes in the assemblages that Rogers used to construct his chronology may be the result of shifts in the function of the tool kits rather than changes through time (Shelley and Altschul 1989). All phases share features such as trails, trail shrines, rock rings, sleeping circles, and geoglyphs. Assignment of a particular phase is generally based on weathering and the degree of desert varnish, a dubious practice at best. San Dieguito I assemblages include large and generally poorly made chipped stone tools, such as choppers, hammer stones, and scrapers, that are heavily patinated. Tools were manufactured largely by percussion flaking. San Dieguito II assemblages include these tools as well, but also include bifaces, leaf-shaped points, and a wider variety of scrapers. These two periods of San Dieguito largely temporally overlap Clovis adaptations in North America; Clovis culture was a pan-continental phenomenon based on the production of leaf-shaped points used to hunt Pleistocene megafauna.

San Dieguito III assemblages contain these elements, although projectile points are smaller and pressure-flaked. Warren (1967) has argued that the San Dieguito represents a generalized hunting tradition that dates from about 10,000 B.P., and should include all of the phases, as well as the Lake Mojave complex, and other California assemblages such as the Owens Lake, Panamint Basin, Mono Lake, and Death Valley I. Bedwell (1970) proposed calling this widespread adaptation the Western Pluvial Lakes tradition.

In general, the San Dieguito adaptation is a foraging tradition based on small bands hunting both large and small game and collecting wild plants. Settlement patterns indicate that sites tend to be located around lakeshores, as well as mesas and terraces overlooking large washes. In the Lower Colorado River region, settlement tended to focus on the floodplain, a trend that would continue through historic times (Stone 1991).

Archaic Period

Archaic period cultural developments in the region have variously been labeled as the San Dieguito–Pinto Basin complex (Cordell 1984), San Dieguito–Amargosa (Haury 1975), or the Western tradition of the Picosa culture (Irwin-Williams 1979), or treated as separate cultural phenomena as the Amargosa tradition and the Pinto Basin complex (Ezzo 1994; Ezzo and Altschul 1994; Shelley and Altschul 1989; Sterner 1992). The Amargosa tradition was first defined by Rogers in the 1930s (Rogers 1939). He based his definition on surface finds in the southern California desert that were located near stream channels, washes, and playas. Haury (1975:Figure 117) undertook refining the Amargosa tradition after finding a mixture of San Dieguito complex and Cochise culture elements in preceramic levels at Ventana Cave. Using a typological approach, Haury sought parallels in the assemblages of the Amargosa and Cochise and employs Ernst Antevs' dates for the Cochise culture as a baseline. He divided the Amargosa into three phases, which he named Amargosa I–III. Amargosa I (7500–7000 B.C.) corresponded to the earliest period of the Chiricahua phase of the Cochise culture, while Amargosa II (7000–3000 B.C.) corresponded

to the remainder of the phase. Amargosa III (3000 B.C.–A.D. 1) was the lower Colorado River equivalent of the San Pedro phase. Haury (1975:537–539) was well aware that Amargosa assemblages lacked absolute dates and considered the chronology provisional.

Unlike the stratified deposits at Ventana Cave, the lower Colorado River region has failed to provide any unequivocal evidence of Amargosa I or II. The White Tanks site, near the Gila River in southwestern Arizona, has provided information on Amargosa III (Schaefer 1992). Elko corner-notched points characterize the earlier occupation, whereas San Pedro corner-notched points and triangular blades distinguish the late occupation (thus indicating the co-occurrence of Cochise and Amargosa material culture in southwestern Arizona). Ground stone implements increase in number during the late occupation and are characteristically basin-shaped. Investigations in the Harquahala Valley of western Arizona have increased our knowledge of Late Archaic period adaptations in the Colorado Desert (Bostwick 1988; Stone 1986). The majority of projectile points here derive from the San Pedro tradition, and ground stone artifacts are a prominent aspect of the assemblage. Both Bostwick (1988) and Stone (1986) suggest that foraging—a collecting-oriented strategy that incorporated cultigens into the annual round—was the predominant mode of subsistence during the Late Archaic.

Little is known of the Pinto Basin complex. Its distribution is primarily within the Mojave Desert and to the north of the region that encompasses the Amargosa tradition. Because of the lack of stratified, excavated sites, it is very difficult to discuss temporal changes within the Pinto Basin complex. The complex has been provisionally dated by Warren (1984) from 5000 to 2000 B.C., and it may have grown out of the Lake Mojave tradition. The site of Indian Hill Rockshelter in Anza-Borrego State Park is the best-documented Late Archaic site that reflects this tradition (McDonald 1992; Wilke et al. 1986). Late Archaic material culture was found at a depth of 1.5 meters (m) below late prehistoric levels. Features and artifacts included rock-lined cache pits, hearths, Elko Eared projectile points, and ground stone. Two human burials were excavated, one of which was dated at 4070 ± 100 B.P. (McDonald 1992). McDonald (1992) interpreted the site as a hunting camp or possible home base. Schaefer (1992) has documented a similar series of cache pits, lithics, and ground stone at Tahquitz Canyon near Palm Springs.

Formative Period

The Formative period witnessed more changes in the cultural assemblage for this area, possibly spurred by influences to the south (Patayan), north (Anasazi), and east (Hohokam). The first ceramics appear during this period, with Lower Colorado Wares found in increasing abundance over time. The trend toward increased reliance on plant material and smaller game continues; site-type diversity increases, and larger sites become more common. Projectile point types from this period are smaller, representing a transition from atlatl to the bow and arrow (Anduze and Seymour 1992).

Patayan sites are characterized by “rock-outlined jacales, gravel or boulder alignments, rock-filled roasting pits, rock-pile trail shrines, thick dry-laid, low-walled rock or boulder structures, rock-shelters, and bedrock milling stones . . . and crudely decorated pottery” (Schroeder 1979:100). Patayan temporal phases are based on indigenous ceramics, trade wares, and settlement patterns (Colton 1945; Rogers 1945; Waters 1982). The changes in ceramic types appear to roughly coincide with drying and filling sequences of prehistoric Lake Cahuilla from the Colorado River overflowing its banks, which indicates that cultural changes or population migration were stimulated by these flooding episodes.

Patayan I Period (A.D. 500–1050)

Rogers (1929) first proposed using the term “Yuman” to describe the prehistoric ceramic assemblages along the Lower Colorado River. He divided the sequence into the Yuman I–III periods. Colton (1939,

1945) rejected the term, claiming it was a reference to an ethnographic culture and therefore not appropriate for prehistoric assemblages. He replaced the term with "Patayan," and renamed Rogers' phases accordingly. Rogers (1945) responded, claiming that Patayan referred to a specific cultural manifestation, while Yuman referred to a loosely knit constellation of material culture that was contained in the assemblages of the Lower Colorado River. Schroeder (1958, 1979) attempted to end the confusion by introducing the term "Hakataya" to refer to all archaeological remains in the region. More recently, Patayan has come back into usage and appears now to be the acceptable term, although, as McGuire and Schiffer (1982) have pointed out, there is really no rationale for this.

Rogers (1945) defines Patayan I period ceramics as polished red ware and vessels with the Colorado shoulder. Types defined by Rogers include Black Mesa Buff, Black Mesa Red-on-buff, Colorado Beige, Colorado Red-on-beige, and Colorado Red. Rogers asserted that these types were of local origin. Schroeder (1952, 1958), on the other hand, denied the existence of Patayan I, finding it difficult to show that these red ware and shouldered vessels did not originate with the Hohokam. Schroeder's ceramic typology is based primarily on temper differences rather than vessel form. Harner (1958), Waters (1982), and Huckell (1986) have likewise proposed chronologies for the ceramic period in the region.

Patayan II Period (A.D. 1050–1500)

A greater variation of ceramic types and the spread of these forms from the Colorado Basin into the California and Arizona Deserts characterize this period. This coincides with at least two of the major Lake Cahuilla filling episodes (Schaefer 1986). Settlement occurs primarily along the shores of the lake and the Colorado River, with short-term, temporary camps being established away from reliable water sources (McGuire and Schiffer 1982:220; Schaefer 1988:26). Vessel forms change as the Colorado shoulder disappears, and recurved rims and flaring margins appear. Stuccoing is also introduced at this time. Tumco, Parker, Salton, and Topoc buff wares and their red-painted equivalents are associated with this period (Schaefer 1988; Shackley 1984; Townsend 1985).

Patayan III (Protohistoric) Period (A.D. 1500+)

The Patayan III period is a time of ceramic continuity, population expansion, and shifting settlement patterns. An increase and movement of population to the Lower Gila River area displaces Hohokam peoples (Wasley and Johnson 1965). A desiccation of the Salton Trough may have caused lake-reliant peoples to migrate south to the Colorado River delta or west to cismontane California (Anduze and Seymour 1992). There appears to have been a dramatic spread of buff wares at this time. Rogers suggests that this is concurrent with the expansion of upland Yuman groups (Pai) into the area (Kroeber 1925, 1951, 1972; Rogers 1945; Stewart 1983a; Stone 1987). During this period, smaller-sized points such as the Desert Side-notched and Cottonwood Triangle are introduced. While it is unclear what ultimately became of the Patayan culture, McGregor (1965:378) suggests it may be related to modern Yuman-speaking groups. Patayan ceramics are found throughout the Protohistoric period and continue into the Historic period (Waters 1982).

Historic Period

The first European to explore the area was the Spaniard Francisco de Ulloa, a captain of Hernando Cortéz. De Ulloa sailed the mouth of the Colorado River in 1539. The next year, Hernando de Alarcón sailed up to the river possibly as far as the modern town of Parker (Stewart 1966:27). Alarcón was the first European to make contact with the River Yumans. Sixty-five years later, in 1604, Don Juan de Oñate, the Spanish governor of New Mexico, mounted an expedition to seek out a supply route from the Gulf of California into New Mexico. Oñate met with people who were probably Mojave living in the Chemehuevi Valley, somewhere near the present location of Lake Havasu Landing.

The first semi-permanent Spanish outposts in the area were the Yuma settlement and the Bicner Mission just to the north, both established in 1780. In 1781, the Yumans, tired of foreign hegemony, revolted, killed the priests, and plundered the missions (Walker and Bufkin 1986). Lieutenant Colonel Pedro Gages led a punitive expedition to the area. They were rebuffed by combined Yuman and Mojave forces; therefore, the Spanish were compelled to abandon their attempts to colonize the river (Forbes 1965; Stewart 1947).

The Mexican War of 1846–1848 was officially concluded by the Treaty of Guadalupe Hidalgo in 1850. This treaty secured much of the Colorado River valley for the United States, with the Gadsden Purchase of 1853 adding the area south of the Gila River. Subsequently, the United States sent a number of military expeditions to the area. Fort Yuma was established in California in 1849, abandoned, and then reestablished in 1851.

The region became attractive to ranchers in the second half of the nineteenth century, with cattle ranching becoming prominent in Yuma and Palo Verde, as well as the area around Blythe, California. Farming, wood-collecting, and mining quickly followed. By the 1920s, the U.S. Bureau of Reclamation had become involved in water-control projects along the Lower Colorado River. Its efforts included levee and channel construction and dredging (Reclamation 1981).

The broad, open expanses of desert were attractive to military operations as early as 1928, when Fly Field was established near Yuma. Initially used to as a stopover point for planes flying across the country, the field was expanded when Yuma Army Air Base was constructed in World War II (WWII) for pilot training. Airfields were established across the western desert to aid in training Army Air Corps personnel. After the war, the Yuma Army Air Base was inactive until 1951, when the Air Force began using it for training. In 1959, the Yuma Air Base was turned over to the Navy for use by the Marine Corps and in 1962 was renamed the Marine Corps Air Station Yuma (Marine Corps Air Station 2009).

Ethnographic Overview

At the time of European contact, the Native Americans occupying the lands along the Lower Colorado River were Yuman-speaking peoples, linguistically a subgroup of Hokan (Kendall 1983). Related peoples inhabited a number of adjacent areas, including the confluence of the Gila and Colorado Rivers, western Arizona, and northwestern Mexico. Some of these groups, such as the Maricopa, had been driven off the Colorado River by the Quechan-Mojave alliance. Raiding, warfare, antagonism between neighboring groups, and alliance by two or more groups to engage in conflicts with others were an integral part of life along the Lower Colorado River; such activity was often designed to increase a group's territory along the river (Stewart 1983a). The best-known alliance was that of the Quechan and Mojave in 1840, and it brought about the relocation of a number of groups, including the Halyikawamai, Kahwan, and Kavelchadom (Stewart 1983a).

The Yuman-speaking peoples can be broadly divided into two groups on the basis of the regions they traditionally occupied—the upland Yumans (Yavapai, Hualapai, and Havasupai) and the lowland Yuman groups (Mojave, Quechan, and Cocopa). Basic ethnographic accounts of lowland Yumans include Bee (1983) for the Quechan, Stewart (1983b) for the Mojave, and Kelly (1977) and Alvarez de Williams (1983) for the Cocopa. These groups were adapted to a riverine, foraging pattern of subsistence, with hunting and gathering being supplemented by floodplain farming of maize, beans, squash, melons, cotton, and various grasses. River Yumans used more than 75 species of wild plants as food, the most important being mesquite and screw bean (Castetter and Bell 1951). Castetter and Bell (1951) have claimed that the Mojave were the most agricultural of the river Yumans and that roughly half of their subsistence derived from farming. The Cocopa, conversely, were the least agricultural. Fish provided an important source of protein; principal species included squawfish and humpbacked sucker (McGuire and Schiffer 1982).

Hunting focused primarily on small game; extensive communal rabbit hunts have been documented ethnographically by Strong (1929) and archaeologically by Altschul and Jones (1989). The settlement system was one of a mobile people living in fairly small groups, the typical site consisting of several houses. Some sites were considerably larger; Spanish observers in 1774 claimed to have seen a Quechan village with at least 800 houses (Bee 1983). Habitation tended to be located just above the floodplain, and people were forced to relocate to higher ground when the river was in flood stage (Alvarez de Williams 1983; Stewart 1983b).

The ritual life of Yuman peoples was extremely important, with major ceremonies performed to honor passage into adulthood, naming of infants, and death. The latter ceremony, known as the keruk, became a composite ceremony in historic times and as such was one of the most important rituals for Yuman peoples. It generally lasted seven days and not only commemorated the dead, but also involved the naming of infants, commemoration of past wars through mock battles, and was a time when economic and social transactions occurred (Altschul and Ezzo 1994; Ezzo and Altschul 1994). Many depictions of mythical beings and places are located along the Lower Colorado River, stretching from the international border at least as far north as Needles, California. These take the form of rock art (Ezzo and Altschul 1994; White 1994), geoglyphs (Ezzo 1994; Ezzo and Altschul 1994; Holmlund 1993; Johnson 1985; Stone 1991; Woods 1986), and rock features (Ezzo 1994; Ezzo and Altschul 1994; Johnson 1985). The importance of these sites and features still resonates through Quechan society (Cachora 1994).

SURVEY METHODS

Resource Definitions

Archaeological resources were evaluated according to criteria established by the Arizona State Museum (ASM). The criteria recognize two classes of archaeological remains: the site and the isolated occurrence (IO). The archaeological site is defined under rules adopted for the administration of the Arizona Antiquities Act:

> "Archaeological site" means any area with material remains of past Indian or non-Indian life or activities that are of archaeological interest, including without limitation, historic or prehistoric ruins, burial grounds, and inscriptions made by human agency. (Arizona Antiquities Act, Arizona Revised Statutes 41-841, *et seq.*, Chapter 8-201, A.3)
>
> As interpreted by the ASM, "remains of archaeological interest" may include "purposeful constructions" or simply concentrations of materials more than 50 years old. Additionally, sites should consist of at least one of the following:
>
> 30+ artifacts of a single class (i.e., 30 sherds, 30 tin cans) within an area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (i.e., one ceramic pot, one core, one glass bottle);
>
> 20+ artifacts which include at least 2 classes of artifact types (i.e., sherds, groundstone, nails, glass) within an area 15 meters (50 feet) in diameter;
>
> One or more archaeological features in temporal association with any number of artifacts;
>
> Two or more temporally associated archaeological features without artifacts.
>
> Non-linear, isolated features without associated artifacts may be recorded at the discretion of the archaeologists. An "isolated feature" is defined as a feature that does not

> have any other features within a 100 meter (325 feet) diameter. This might include isolated rock piles. mine shafts, prospecting pits or unidentified depressions without associated artifact associations. (ASM 1995)

An archaeological occurrence meeting these minimum criteria is recorded as a site. An occurrence not meeting these criteria is generally classified as an IO, although under exceptional circumstances an occurrence may be judgmentally classified as a site.

Survey Coverage

SWCA archaeologists Eric Petersen, Heather West, and Paul Rawson surveyed the project area on April 11 and 12, 2016, resulting in a total of six person–field days. General conditions for the survey were excellent, and ground visibility was generally 95 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 m (66 feet) apart. The survey entailed systematically walking the 131.0-acre project area in parallel transects spaced no more than 20 m apart.

The archaeologists sought evidence for cultural resources 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 historical structures, or other cultural anomalies). In addition to searching for archaeological remains, the archaeologists included in their survey in-use properties (e.g., buildings, roads, corrals) greater than 50 years old.

Once a site was identified, the crew then proceeded to mark the locations of artifacts and features with pin flags. Next, individual crew members began his or her assigned tasks. Tasks included completing the site form, conducting artifact inventories, completing feature descriptions, taking photographs, and mapping the site with a handheld global positioning system (GPS) unit. GPS data were reported in Universal Transverse Mercator (UTM) coordinates projected using the 1983 North American Datum (NAD 1983). No artifacts were collected.

Archaeological remains designated as IOs were point located and recorded using a handheld GPS unit. When culturally diagnostic or unusual items comprised IOs, they were photographed.

National and Arizona Registers 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). The same criteria are used to evaluate properties for inclusion in the Arizona Register of Historic Places (ARHP) (Arizona Administrative Code Section R12-8-302). 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/ARHP. According to the NRHP/ARHP 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.

SURVEY FINDINGS

The survey of the project area resulted in the documentation of one newly recorded archaeological site (AZ X:6:135[ASM]) and eight isolated occurrences (Figure 5). AZ X:6:135(ASM) is the remains of a World War II Auxiliary airfield. The IOs consist of prehistoric pot drops and historic-era trash. A description of the site and a discussion of its significance follow.

AZ X:6:135(ASM)—Aux No. 4/Rolle Airfield

Site Type: Military / Airfield

Cultural Affiliation: Euro-American / Military

Temporal Affiliation: Post–1940s

Dimensions/Area: 4,225 × 3,800 feet (N-S × E-W) / 231 acres]

Land Ownership: Federal

Legal Description: Section 35, Township 10 South, Range 24 West, in Yuma County, on the USGS Somerton, Arizona, 7.5-minute quadrangle

Location within Project Area: Partially within

NRHP/ARHP Eligibility: Ineligible

Site Overview

AZ X:6:135(ASM), Aux No. 4, is one of seven airfields constructed during World War II near the Yuma Army Airfield. AZ X:6:135(ASM) is located on sandy desert flats surrounded by sandy dunes in the Yuma Desert. Creosote is the dominant vegetation on and adjacent to the site. The site is at an elevation of 163 feet amsl.

Aux No. 4 consists of two 285-foot-wide, 3,740-foot-long runways (Feature 1) and a road/taxiway in a triangular configuration (Figure 6). The remnants of an apron abut the road/taxiway on the northeastern side of the triangle (Feature 3). The tarmac is composed of a sand and oil conglomerate 2 to 3 inches (5–7 centimeters) thick. One runway (Runway 17-35) has been improved and is currently in-use by the YCAA, and the second runway is inactive and is in various stages of decomposition.

Runway 17-35 (Feature 1), aligned roughly north–south, consists of the original 285-foot-wide × 3,740-foot-long sand and oil conglomerate tarmac. In 1976, improvements to Runway 17-35 were conducted. These improvements consisted of leveling a 50 × 2,500–foot area, preparing an aggregate base course, followed by a 2-inch asphaltic overlay and an emulsion seal coat. In addition, a parking lot/tie down area and a small hanger were constructed off the north end of Runway 17-35. According to online aerial photographs, these features were constructed in late 2012 (Google Earth 2016).

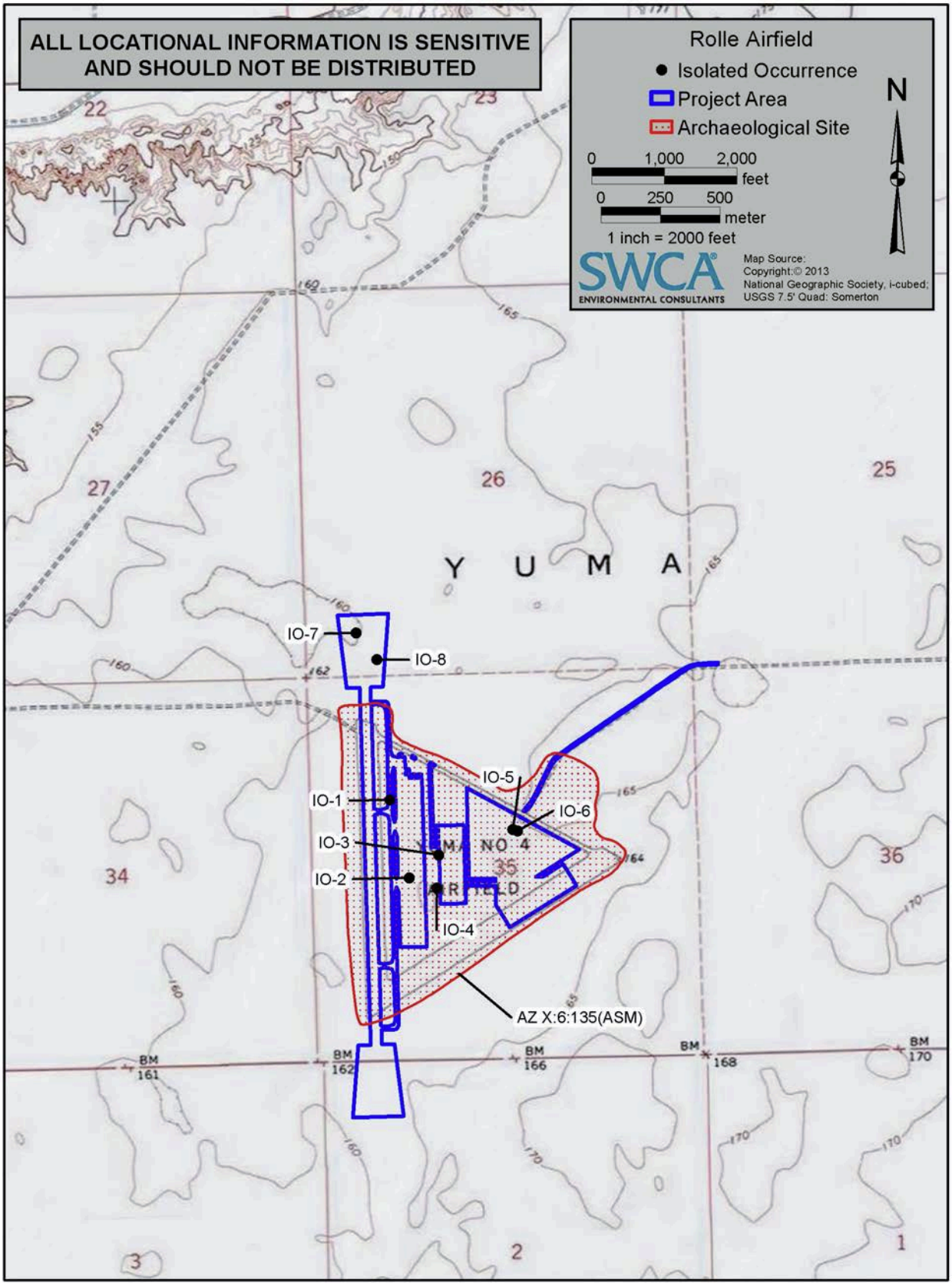


Figure 5. Results of current survey.

The second runway (Feature 1), aligned roughly east–west, consists of the original 285-foot-wide × 3,740-foot-long sand and oil conglomerate tarmac. The tarmac is in a state of disrepair and exhibits numerous cracks, voids, and creosote growing through the tarmac (Figure 7). Within the western end of the runway, a leveled, asphalted helicopter pad that measures 165 × 125 feet has been constructed. According to aerial photographs, this helicopter pad was constructed between 1996 and 2003 (Google Earth 2016).

Feature 2 is the partially in-use northwest/southeast-trending road/taxiway that connects the two runways. The road measures 50 feet wide × 3,335 feet long and is constructed with a thick sand and oil conglomerate. It is partially in use to access the parking/tie down and hanger area and a portion has been repaved at the entry gate.

Feature 3 is the faint remnant of the apron that abuts the Feature 2 on the southeast. The apron is roughly "U"-shaped, with two short access roads leading from Feature 2 to a parking area. Based on the 1943 aerial photograph of Aux No. 4, the access roads and parking area were paved in a similar fashion as the runways (Figure 8). Currently, there is no evidence of pavement and the apron is only faintly visible on the ground surface and in aerial images.

The interior of the triangular configuration of the runways is covered in native vegetation that consists of creosote. The Aux No. 4 perimeter fence bisects the interior area and there is a faint two-track road that originates from Feature 2 adjacent to Feature 3. This road trends northeast–southwest and turns roughly north–south at the perimeter fence. Four historical artifacts were documented within the interior of the triangular configuration. The observed artifacts include one crushed hole-in-top can and one crushed hole-in-cap can (1810–1920), one metal SAE 10 oil can (1933–1941), and one Owen Illinois brown bottle break (1929–1954). Based on the temporal range, it is difficult to associate these artifacts with Aux No. 4.

Historic Context for Aux No. 4

Establishment of the Yuma Army Air Field in 1942, initially for single-engine pilot training, included association with the vast Gila Bend Gunnery Range (now the Barry M. Goldwater Range [BMGR]) immediately east of the airfield . The U.S. Army Air Force (USAAF) contracted construction of seven auxiliary airfields to serve Yuma Army Air Field, each in the undeveloped desert a few miles south and east of the main airfield. These air strips, each of triangular plan with two 4,000-foot runways connected by an equidistant taxiway, served for practice runways, emergency landings, and daily refueling and re-arming of aircraft during flight and gunnery practice. The USAAF added a gunnery school in 1943 to the Yuma operation and in 1944 added multi-engine bomber flight and gunnery training. Yuma Army Air Field closed in late 1945; the main airfield became Yuma County Airport, and some of the auxiliary airfields served private aircraft, including crop dusters. Undeveloped training lands returned to the War Assets Administration, then to the U.S. Army Corps of Engineers, and finally to the U.S. Bureau of Reclamation, which used it as a headquarters for its irrigation projects (Freeman 2010; Marine Corps Air Station 2010).

In 1951, the USAAF reactivated the east side of the main airfield as Yuma Air Force Base (Yuma AFB) and re-established the nearby desert gunnery range in association with Luke and Williams Air Force Bases near Phoenix. In 1956, Yuma AFB became Vincent AFB, but in 1959, the Department of the Navy assumed operation of the facility as an auxiliary station for U.S. Marine Corps fliers. In 1962, the facility was named Marine Corps Air Station Yuma (MCASY) (Marine Corps Air Station 2010).

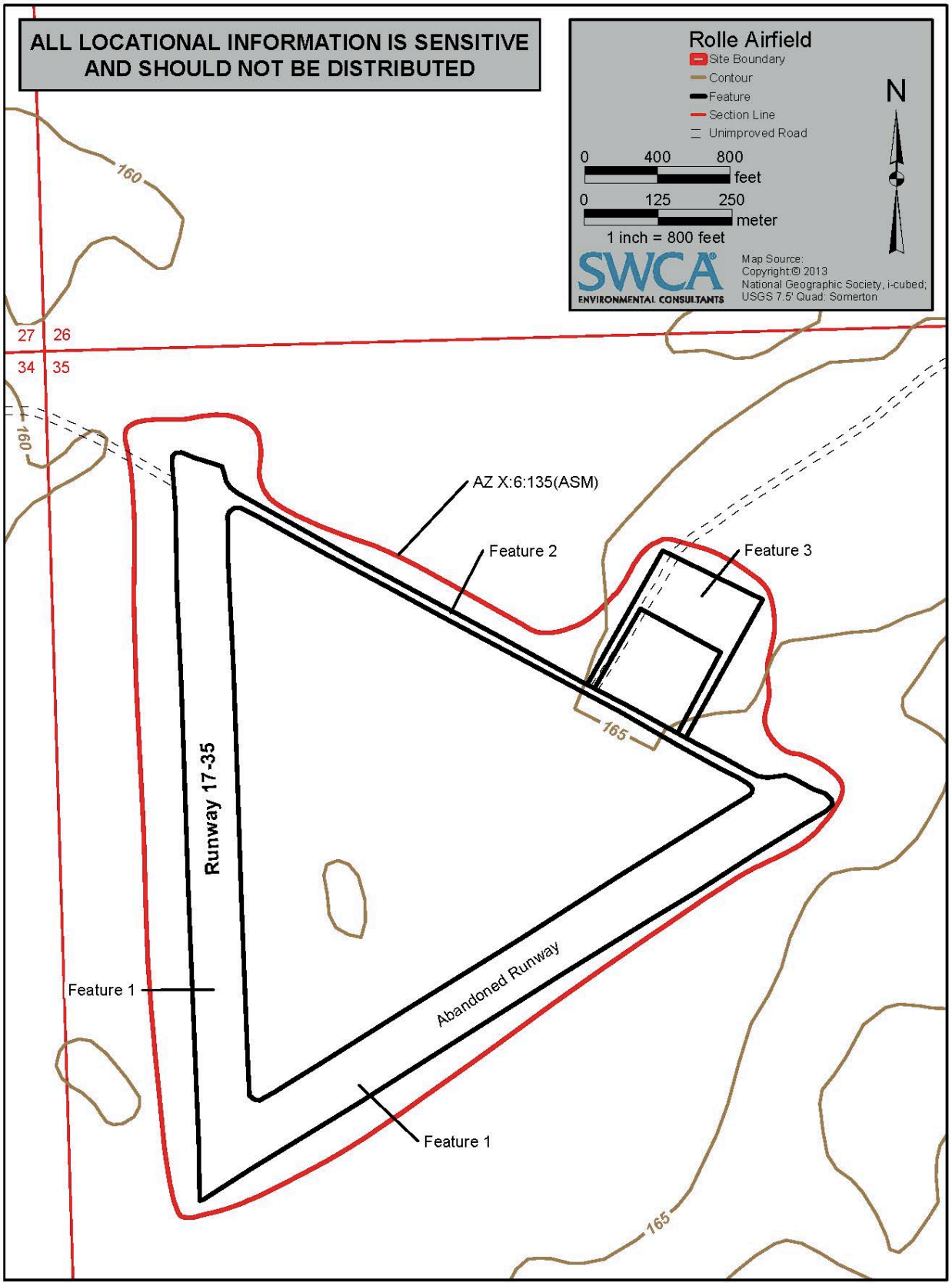


Figure 6. AZ X:6:135(ASM) site map.

Figure 7. Overview of the east–west runway at AZ X:6:135(ASM); view facing southwest.

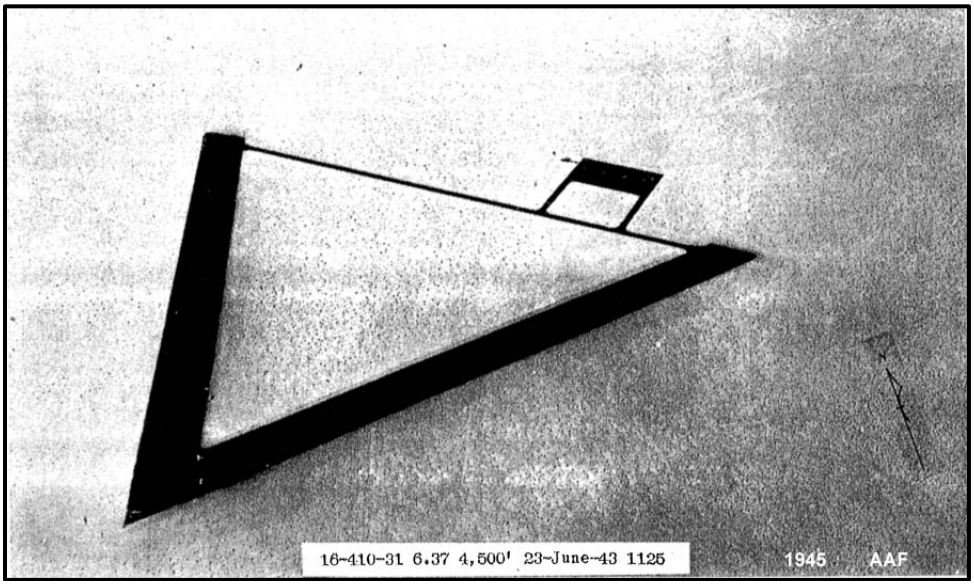


Figure 8. Aerial view of Aux No. 4 (AZ X:6:135[ASM]) in 1943.

The USAAF used a standard WWII auxiliary airfield design for a variety of applications throughout its continental U.S. training areas (Freeman 2010). The triangular plan of generally two 200-foot-wide × 4,000-foot-long runways, and one equidistant connecting taxiway with parking apron, was built in configurations suited to local terrain and prevailing winds. Yuma Army Air Field's Aux No. 4 airfield was constructed in 1942–1943, with a north-south runway (Runway 17-35) at its west side, a southwest-northeast runway along its south angle, and the southeast-northwest taxiway with apron as its northeast

side. The two runways, taxiway, and apron were constructed with a 2- to 3-inch layer of oiled sand over native sand. An operations building was also constructed.

Aux No. 4, also known as Rolle Field, was declared surplus in 1945 and relinquished to the U.S. Department of the Interior in 1947, and to the U.S. Bureau of Reclamation. On March 17, 1952, Reclamation provided Yuma County a license to operate, maintain, and manage Rolle Field. In 1966, the Yuma County Farm Bureau assumed responsibility for the Airfield since the primary beneficiaries in the area would be farmers and growers due to crop-dusting operations. The YCAA was established in 1966 to administer the renamed Yuma International Airport; it also took responsibility for managing Aux No. 4 (Rolle Field) on February 24, 1972. The intent was to provide a site for civilian pilot training in the region and to reduce air traffic conflicts with the Yuma International Airport/MCASY air traffic. The original agreement between Reclamation and Yuma County was amended on September 17, 1973, to allow for an additional term of license and to access available State funds for capital improvements. Simultaneously, the Rolle Field airport license was officially delegated to the YCAA by the Yuma County Board of Supervisors. Improvements to Runway 17-35 took place in early 1976, and consisted of leveling a 50 × 2,500–foot area and installing a prepared aggregate base course followed by a 2-inch asphaltic overlay and an emulsion seal coat. The runway improvement sparked use of the airfield for student pilot training as air traffic in and around Yuma International Airport/MCASY increased. In 1986, Yuma County signed a new agreement with Reclamation extending the term of license an additional 25 years, and in 2009, it was renewed for another 25 years.

Interpretation and NRHP Eligibility

AZ X:6:135(ASM), Aux No. 4, is one of seven auxiliary (Aux) airfields constructed during World War II near the Yuma Army Airfield. While Aux No. 4 is recognizable with respect to its former role as a WWII airstrip, alterations beginning in 1976 have included modifications of the runway surfaces, construction of a parking lot/tie down area, and erection of a small hanger, which have resulted in a loss of some of the integrity of design, materials, and workmanship of the WWII period (1942–1945) airfield. Of the seven Aux fields associated with Yuma Airfield (Aux 1–4 in Yuma; Aux 5 in Wellton, Aux 6 in Colfred, and Aux 7 in Stoval), only Colfred and Stoval are fairly intact. At Colfred, the runways and taxilane have been lightly resurfaced and some buildings have been built on the apron. At Stoval (AZ Y:6:34[ASM]) (which was recommended eligible by Bruder et al. [1996], Davis et al. [2006], and Slaughter et al. [2000], and determined eligible by the State Historic Preservation Office [SHPO] in 2008), one runway has been lightly resurfaced. The Wellton Aux has not been resurfaced, but part of the taxiway is under cultivation. The resurfacing at Colfred and Stoval are very minor compared to that at Aux 2 and 4 in Yuma. Other recommended eligible Aux fields on the BMGR include Luke 7–11, which are similar in triangular configuration, but have three runways.

SWCA recommends AZ X:6:135(ASM) as ineligible for listing on the ARHP/NRHP based on the existence of other auxiliary airfields on BMGR in original condition and already determined NRHP eligible by the Department of Defense and the Arizona SHPO. All of these auxiliary airfields exhibit standard design and construction techniques for U.S. Army Air Force installations of WWII. Construction and use of Aux No. 4 in its WWII context is sufficiently documented and other similar facilities on BMGR are better preserved and available for further study (Thompson 2004).

Isolated Occurrences

Eight IOs of artifacts were recorded during survey of the project area (Table 2; see Figure 5). Five IOs are historic-era manifestations and consist of brown bottle glass and metal cans. Based on the assemblage, the artifacts date between 1810 and 1956. Three IOs are prehistoric manifestations and consist of plain ware ceramic pot drops.

Table 2. Isolated Occurrences

IO No.	IO Description	Area of Dispersal	Easting*	Northing*
1	One crushed hole-in-cap can	—	716281	3600274
2	Twenty-two sand-tempered plain ware sherds from a pot drop	4 m	716362	3599949
3	Eight sand-tempered plain ware sherds from a pot drop	3 m	716481	3600046
4	One crushed hole-in-top can	—	716475	3599903
5	One metal “SAE 10” oil can	—	716792	3600155
6	One Owens Illinois brown glass bottle break	4 m	716819	3600144
7	Three sand-tempered plain ware sherds	1 m	716137	3600981
8	One Owens Illinois brown bottle break. Maker’s mark indicates 1931 or 1942.	3 m	716230	3600865

* UTM coordinates (NAD 83), Zone 11

SUMMARY AND MANAGEMENT RECOMMENDATIONS

An archaeological survey of the project area resulted in the identification of one newly recorded site (AZ X:6:135[ASM]) and eight isolated occurrences (IOs). AZ X:6:135(ASM) is a historic manifestation that consists of the remnants of Auxiliary Airfield No. 4 constructed in 1942. The eight IOs consist of three historic metal cans, two brown glass bottle breaks, and three prehistoric ceramic scatters representing pot breaks. The IOs are ineligible for listing in the Arizona or National Register of Historic Places.

AZ X:6:135(ASM), Aux No. 4, is one of seven auxiliary (Aux) airfields constructed during World War II near the Yuma Army Airfield. While Aux No. 4 is recognizable with respect to its former role as a WWII airstrip, alterations beginning in 1976 have included modifications of the runway surfaces, construction of a parking lot/tie down area, and erection of a small hanger, which have resulted in a loss of some of the integrity of design, materials, and workmanship of the WWII period (1942–1945) airfield. Of the seven Aux fields associated with Yuma Airfield (Aux 1–4 in Yuma; Aux 5 in Wellton, Aux 6 in Colfred, and Aux 7 in Stoval), only Colfred and Stoval are fairly intact. At Colfred, the runways and taxilane have been lightly resurfaced and some buildings have been built on the apron. At Stoval (AZ Y:6:34[ASM]) (which was recommended eligible by Bruder et al. [1996], Davis et al. [2006], and Slaughter et al. [2000], and determined eligible by SHPO in 2008), one runway has been lightly resurfaced. The Wellton Aux has not been resurfaced, but part of the taxiway is under cultivation. The resurfacing at Colfred and Stoval are very minor compared to that at Aux 2 and 4 in Yuma. Other recommended eligible Aux fields on the Barry M. Goldwater Range include Luke 7–11, which are similar in triangular configuration, but have three runways.

SWCA recommends AZ X:6:135(ASM) as ineligible for listing on the ARHP/NRHP based on the existence of other auxiliary airfields on BMGR in original condition and already determined NRHP eligible by the Department of Defense and the Arizona SHPO. All of these auxiliary airfields exhibit standard design and construction techniques for U.S. Army Air Force installations of WWII. Construction and use of Aux No. 4 in its WWII context is sufficiently documented and other similar facilities on BMGR are better preserved and available for further study (Thompson 2004).

SWCA recommends this project will have No Adverse Effect on historic properties. However, if previously undocumented buried cultural resources are identified during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) of the discovery, until a qualified archaeologist has documented the discovery and evaluated its eligibility for the Arizona or National Register of Historic

Places, as appropriate, and Tribes have been consulted, as appropriate. Work must not resume in this area without approval of the lead agency.

If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) of the discovery. The Arizona State Museum, lead agency, SHPO, and appropriate Tribes must be notified of the discovery within 24 hours (following ASM and/or agency protocol). All discoveries will be treated in accordance with Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 United States Code 3001–3013) and work must not resume in this area without proper authorization from ASM and the lead agency.

REFERENCES CITED

Adovasio, James M., J. D. Gunn, J. Donahue, R. Stuckenrath, J. E. Guilday, and K. Volman
1980 Yes, Virginia, It Really Is That Old. *American Antiquity* 45:588–595.

Altschul, Jeffrey H., and Joseph A. Ezzo
1994 The Expression of Ceremonial Space along the Lower Colorado River. In *Recent Research Along the Lower Colorado River*, edited by Joseph A. Ezzo, pp. 51–67. Technical Series No. 51. Statistical Research, Inc., Tucson.

Altschul, Jeffrey H., and Bruce A. Jones
1989 *A Cultural Resources Sample Survey of Operation Zones, Barry M. Goldwater Range, Marine Corps Air Station, Yuma, Arizona*. Technical Series No. 24. Statistical Research, Inc., Tucson.

Alvarez de Williams, Anita
1983 Cocopa. In *Southwest*, edited by Alfonso Ortiz, pp. 99–112. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Anduze, Richard A., and Gregory R. Seymour
1992 *A Cultural Resource Survey for a Fiber Optic Cable Easement for the Southern Telephone Company from Quartzite to Ehrenberg, La Paz County, Arizona*. Archaeological Report No. 92-58. SWCA Environmental Consultants, Tucson.

Arizona Geological Survey
2015 The Geological Map of Arizona. Available at: http://data.azgs.az.gov/geologic-map-of-arizona/#. Accessed April 12, 2016.

Arizona State Museum (ASM)
1995 *Revised Site Definition Policy*. Arizona State Museum, University of Arizona, Tucson.

Bedwell, S. F.
1970 Prehistory and Environment of the Pluvial Fort Rock Lake Area of Southwestern Oregon. Unpublished Ph.D. dissertation, University of Oregon, Eugene.

Bee, Robert L.
1983 Quechan. In *Southwest*, edited by Alfonso Ortiz, pp. 86–98. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Bostwick, Todd W. (editor)
1988 *An Investigation of Archaic Subsistence and Settlement in the Harquahala Valley, Maricopa County, Arizona*. Northland Research, Inc., Flagstaff.

Brown, David E.
1994 *Biotic Communities: Southwestern United States and Northwestern Mexico*. University of Utah Press, Salt Lake City.

Bruder, J. Simon, Kristopher S. Shepard, and Deborah I. Olszwski
1996 *The Western Edge: Cultural Resources Assessment for the Yuma Aviation Training Range Complex on the Goldwater Range, Southwestern Arizona*. Intermountain Cultural Resource Services Research Paper No. 24. Dames and Moore, Phoenix.

Cachora, Lorey
1994 Spirit Life of the Yuman-Speaking Indians: Colorado River between California and Arizona. In *Recent Research along the Lower Colorado River*, edited by Joseph A. Ezzo, pp. 13–14. Technical Series No. 51. Statistical Research, Inc., Tucson.

Campbell, Elizabeth W. Crozer, and William H. Campbell
1935 *The Pinto Basin Site: An Ancient Aboriginal Camping Ground in the California Desert*. Southwest Museum Papers No. 9. Southwest Museum, Los Angeles.

Castetter, Edward F., and Willis H. Bell
1951 *Yuman Indian Agriculture*. University of New Mexico Press, Albuquerque.

Colton, Harold S.
1939 *Prehistoric Cultural Units and Their Relationships in Northern Arizona*. Bulletin No. 17. Museum of Northern Arizona, Flagstaff.

1945 The Patayan Problem in the Colorado River Valley. *Southwestern Journal of Anthropology* 1(1):114–121.

1958 *Pottery Types of the Southwest*. Museum of Northern Arizona Ceramic Series No. 3D. Northern Arizona Society of Science and Art, Flagstaff.

Cordell, Linda S.
1984 *Prehistory of the Southwest*. Academic Press, Orlando.

Courtright, J. Scott
2001 *A Cultural Resources Survey of 85.6 Acres for the Proposed Yuma Area Service Highway Port of Entry Road, East of San Luis, Yuma County, Arizona*. Technical Report 95-542. Logan Simpson Design, Tempe.

Davis, Margaret, John W. Hohmann, and W. Bryan Cole
2006 *A Class III Archaeological Survey of 479.55 Acres at the AZARNG Rittenhouse Auxiliary Airfield, Maricopa and Pinal Counties, Arizona.* Clearance Report No. 529. The Louis Berger Group, Phoenix.

Dorn, Ronald I.
1983 Cation-Ratio Dating: A New Rock Varnish Age-Determination Technique. *Quaternary Research* 20:49–73.

Effland, Richard
1985 Letter Report to John Madsen. Archaeological Consulting Services, Tempe.

Ezzo, Joseph A.
1994 *On the Trail to Avikwaame: Results of a Noncollection Class II Cultural Resources Survey of Quien Sabe/Big Maria Terrace, Riverside County, California*. Technical Series No. 49. Statistical Research, Inc., Tucson.

Ezzo, Joseph A., and Jeffrey H. Altschul (editors)
1994 *Glyphs and Quarries along the Lower Colorado River*. Technical Series No. 44. Statistical Research, Inc., Tucson.

Forbes, Jack D.
1965 *Warriors of the Colorado: The Yumans of the Quechan Nation and Their Neighbors*. University of Oklahoma Press, Norman.

Freeman, Paul
2010 Abandoned & Little Known Airfields: Arizona – Yuma. Available at: http://www.airfields-freeman.com/AZ/Airfields_AZ_Yuma.htm#yumaaux1/88. Accessed January 29, 2010.

Google Earth
2016. U.S. Department of State Geographer Image Landsat. Available at: https://www.google.com/earth/. Accessed April 2016.

Harner, Michael J.
1958 *Lowland Patayan Phases in the Lower Colorado River Valley and Colorado Desert.* Archaeological Survey Reports 42:93–97. University of California, Los Angeles.

Harry, Karen G.
1992 *Lithic Procurement and Rock Varnish Dating: Investigations at CA-KER-140, a Small Quarry in the Western Mojave Desert*. Technical Series No. 36. Statistical Research, Inc., Tucson.

Haury, Emil
1975 *The Stratigraphy and Archaeology of Ventana Cave*. University of Arizona Press, Tucson.

Hayden, Julian D.
1976 Pre-altithermal Archaeology in the Sierra Pinacate, Sonora, Mexico. *American Antiquity* 41:274–289.

Haynes, C. Vance
1980 Paleoindian Charcoal from Meadowcroft Rockshelter: Is Contamination a Problem? *American Antiquity* 45:582–587.

Holmlund, James
1993 *The Ripley Geoglyph Complex: Results of an Intensive Survey*. Technical Report No. 93-15. Statistical Research, Inc., Tucson.

Huckell, Bruce B.
1986 *A Ground Stone Implement Quarry on the Lower Colorado River, Northwestern Arizona*. Cultural Resources Series Monograph No. 3. Bureau of Land Management, Phoenix.

Irwin-Williams, Cynthia
1979 Post-Pleistocene Archaeology, 7000–2000 B.C. In *Southwest*, edited by Alfonso Ortiz, pp. 31–42. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Johnson, Boma
1985 *Earth Figures of the Lower Colorado and Gila River Deserts: A Functional Analysis*. The Arizona Archaeologist No. 20. Arizona Archaeological Society, Phoenix.

Kelly, William H.
1977 *Cocopa Ethnography*. Anthropological Papers No. 29. University of Arizona Press, Tucson.

Kendall, M. B.
1983 Yuman Languages. In *Southwest*, edited by Alfonso Ortiz, pp. 4–12. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Kroeber, Alfred L.
1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin No. 78. Government Printing Office, Washington, D.C.

1951 *A Mohave Historical Epic*. Anthropological Records No. 11. University of California Press, Berkeley.

1972 *More Mohave Myths*. Anthropological Records No. 27. University of California Press, Berkeley.

Lite, Jeremy A.
1997 *A Cultural Resources Survey for the Proposed 25 Mile-Long Yuma Area Service Highway Between San Luis and Interstate-8 at Araby Road, Southwestern Yuma County, Arizona*. Archaeological Research Services, Tempe.

MacNeish, Richard S., A. Nelken-Terner, and A. Garcia Cook
1980 Introduction. In *Prehistory of the Ayacucho Basin,* Vol. 2, edited by R. S. MacNeish, A Garcia-Cook, L. G. Lumbreras, R. K. Vierra, and A. Nelken-Terner, pp. 1–18. University of Michigan Press, Ann Arbor.

Marine Corps Air Station
2009 Yuma Station: Available at: http//www.yuma.usmc.mil/information/history.html. Accessed November 23, 2009.

2010 History. Available at: http://www.yuma.usmc.mil/information/history.html. Accessed February 8, 2010.

McDonald, Alison M.
1992 Indian Hill Rockshelter and Aboriginal Cultural Adaptation in Anza-Borrego Desert State Park, Southeastern California. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Riverside.

McGregor, John C.
1965 *Southwestern Archaeology*. University of Illinois Press, Chicago.

McGuire, Randall H., and Michael B. Schiffer
1982 *Hohokam and Patayan: Prehistory of Southwestern Arizona*. Academic Press, New York.

McQuestion, Kathleen M., Robert G. Haynes-Peterson, and Pat H. Stein
1992 *An Archaeological Survey of the Yuma Lateral Expansion Project, La Paz and Yuma Counties*. SWCA Environmental Consultants, Tucson.

Moratto, Michael J.
1984 *California Archaeology.* Academic Press, New York.

Morrison, Mary
2002 *A Cultural Resources Survey of 84.5 Acres for the Proposed Yuma Area Service Highway, East of San Luis, Yuma County, Arizona*. Technical Report No. 015145. Logan Simpson Design, Tempe.

Rogers, Malcolm J.
1929 *Report of an Archaeological Reconnaissance in the Mojave Sink Region*. Papers No. 1. San Diego Museum of Man, San Diego.

1936 Yuman Ceramics. Paper presented at the Social Science Section of the American Association for the Advancement of Science Meetings in Flagstaff. On file, Arizona State Museum Library, University of Arizona, Tucson.

1939 *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas*. Papers No. 3. San Diego Museum of Man, San Diego.

1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1:167–198.

1958 San Dieguito Implements from the Terraces of the Rincon-Pantano and Rillito Drainage System. *The Kiva* 24:1–23.

1966 *Ancient Hunters of the Far West*. Union-Tribune Publishing Company, San Diego.

Rowe, Robert
2007 *A Cultural Resources Survey for the Yuma TS-8 to San Luis 69kV Transmission Line Project, Yuma County, Arizona*. Cultural Resources Report No. 2007-0026. EPG, Phoenix.

Schaefer, Jerry
1986 *Late Prehistoric Adaptations during the Final Recessions of Lake Cahuilla: Fish Camps and Quarries on West Mesa, Imperial Valley, California*. Report prepared for the Bureau of Land Management, El Centro District, California. Mooney-Levine and Associates, San Diego.

1988 *Lowland Patayan Adaptations to Ephemeral Alkali Pans at Superstition Mountain, West Mesa, Imperial County, California*. On file, Bureau of Land Management, El Centro District, California.

1992 *Hunter-Gatherer Settlement, Subsistence, and Symbolism at White Tanks, Yuma Proving Ground, Arizona*. Report prepared for the U.S. Army Corps of Engineers, Los Angeles. Brian F. Mooney Associates, San Diego.

Schroeder, Albert H.
1952 *A Brief Survey of the Lower Colorado River from Davis Dam to the International Border*. On file, National Park Service, Boulder City, Nevada.

1958 Lower Colorado Buff Ware: A Descriptive Revision. In *Pottery Types of the Southwest, Wares 15, 16, 17, 18: Revised Descriptions Alameda Brown Ware, Tizon Brown Ware, Lower Colorado Buff Ware, Prescott Gray Ware, San Francisco Mt. Gray Ware*, edited by Harold S. Colton. Museum of Northern Arizona Ceramic Series No. 3D. Northern Arizona Society of Science and Art, Flagstaff.

1979 Prehistory: Hakataya. In *Southwest*, edited by Alfonso Ortiz, pp. 100–107. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Shackley, M. Steven
1984 *Archaeological Investigations in the Western Colorado Desert: A Socioecological Approach.* Wirth Environmental Services, Inc., San Diego.

Shelley, Steven D., and Jeffrey H. Altschul
1989 *Paleoenvironments and Archaeology of the Trigo Mountains.* Technical Series No. 15. Statistical Research, Inc., Tucson.

Slaughter, Mark C., David B. Tucker, and Annick Lascaux (editors)
2000 *Trade Corridors and Ethnic Boundaries: An Archaeological Survey of 12,089 Acres along the Growler and San Cristobal Washes on the Barry M. Goldwater Range in Southwestern Arizona.* Cultural Resources Report No. 98-181. ARCADIS Geraghty and Miller, Phoenix, and SWCA Environmental Consultants, Tucson.

Sterner, Matthew A.
1992 *Cultural Resource Overview of the Yuma District Project*. Statistical Research, Inc., Tucson.

Stewart, Kenneth M.
1947 Mohave Warfare. *Southwestern Journal of Anthropology* 3:257–278.

1966 The Mohave Indians in Hispanic Times. *The Kiva* 32(1):25–38.

1983a Mohave. In *Southwest*, edited by Alfonso Ortiz, pp. 55–70. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

1983b Yumans: Introduction. In *Southwest*, edited by Alfonso Ortiz, pp. 1–3. *Handbook of North American Indians*, Vol. 10. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Stone, Connie L.
1986 *Deceptive Desolation: Prehistory of the Sonoran Desert in West Central Arizona.* Cultural Resources Series No. 1. Bureau of Land Management, Arizona State Office, Phoenix.

1987 *People of the Desert, Canyons, and Pines: Prehistory of the Patayan Country in West Central Arizona*. Cultural Resources Series No. 5. Bureau of Land Management, Arizona State Office, Phoenix.

1991 *The Linear Oasis: Managing Cultural Resources along the Lower Colorado River*. Cultural Resources Series No. 6. Bureau of Land Management, Arizona State Office, Phoenix.

Strong, William Duncan
1929 Aboriginal Society in Southern California. *University of California Publications in American Archaeology and Ethnology* 26:1–349.

Thompson, Scott
2004 *Gateway to Combat: A Historic Context for Military Aviation Training on the Barry M. Goldwater Range East, Arizona, World War II and Early Cold War Eras*. Statistical Research, Inc., Tucson.

Townsend, Janet
1985 *Prehistoric Lifeways in the Jacumba Valley*. Wirth Environmental Services, Inc., San Diego.

U.S. Bureau of Reclamation (Reclamation)
1981 *Water and Power Resources Service: Project Data*. U.S. Bureau of Reclamation, Washington, D.C.

Walker, Henry P., and Don Bufkin
1986 *Historical Atlas of Arizona*. University of Oklahoma Press, Norman.

Warren, Claude N.
1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:168–185.

1984 Desert Region. In *California Archaeology,* by Michael J. Moratto, pp. 338–430. Academic Press, New York.

Warren, Claude N., and Robert Crabtree
1986 Prehistory of the Southwestern Area. In *Great Basin*, edited by W. L. D'Azevedo. *Handbook of North American Indians*, Vol. 11. William C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Wasley, William W., and Alfred E. Johnson
1965 *Salvage Archaeology in Painted Rock Reservoir, Western Arizona*. Anthropological Papers No. 9. University of Arizona Press, Tucson.

Waters, Michael R.
1982 The Lowland Patayan Tradition. In *Hohokam and Patayan: Prehistory of Southwestern Arizona*, edited by Randall McGuire and Michael B. Schiffer, pp. 275–297. Academic Press, New York.

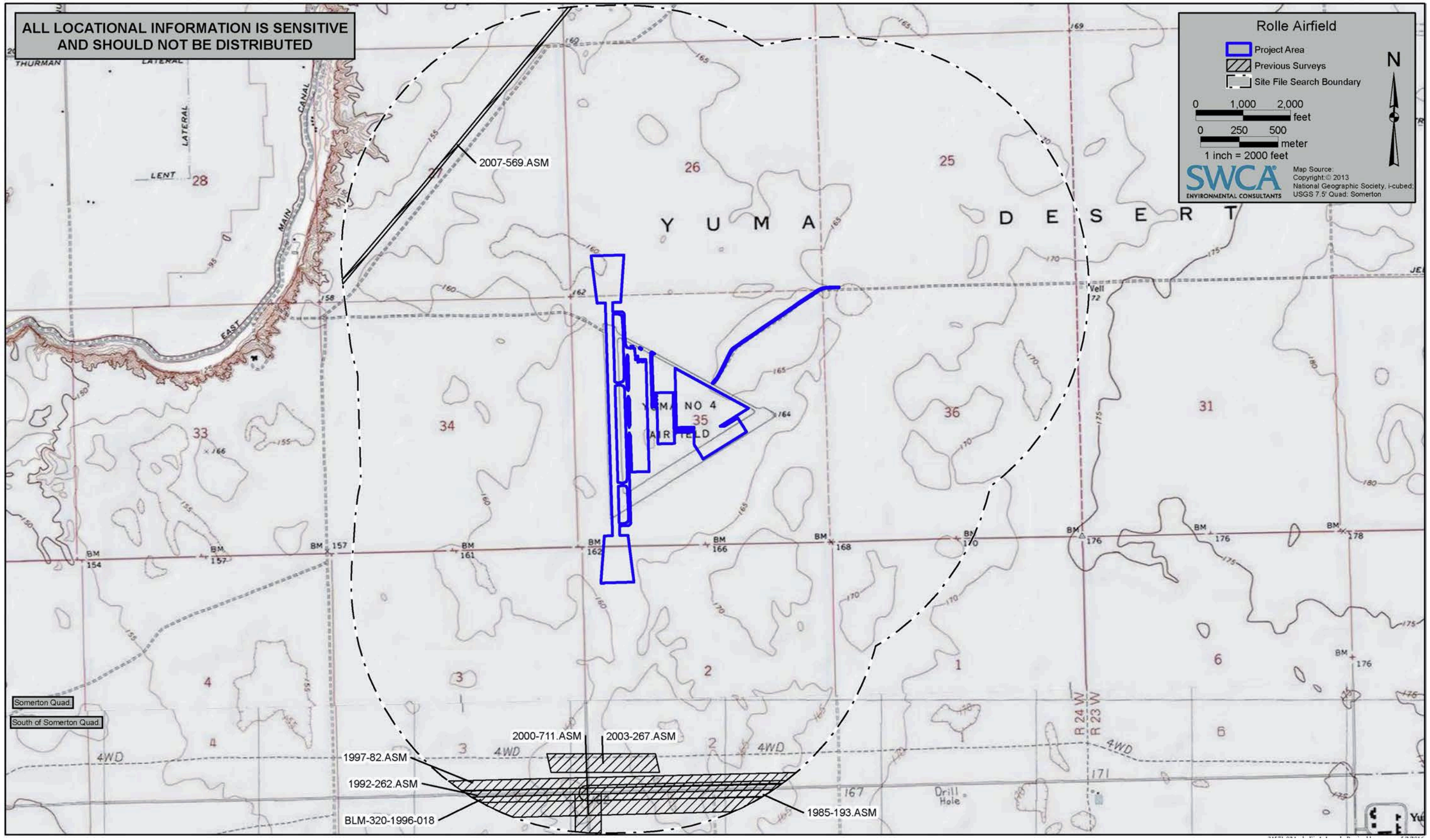
White, William G.
1994 Cast Shadows, A Lizard's Tail, and Time Reckoning: A Calendrical Petroglyph along the Lower Colorado River. In *Recent Research along the Lower Colorado River,* edited by Joseph A. Ezzo, pp. 69–80. Technical Series No. 51. Statistical Research, Inc., Tucson.

Wilke, Philip J., A. Meg McDonald, and L. A. Payen (editors)
1986 *Excavation at Indian Hill Rockshelter, Anza-Borrego State Park, California, 1984–1985.* Prepared for California Department of Parks and Recreation. Archaeological Research Unit, University of California, Riverside.

Woods, Clyde W.
1986 *Archaeology of Creation: Native American Ethnology of Cultural Resources at Pilot Knob*. Prepared for Bureau of Land Management, El Centro District, California.

APPENDIX A

Previous Research Maps


ALL LOCATIONAL INFORMATION IS SENSITIVE AND SHOULD NOT BE DISTRIBUTED
Rolle Airfield
Project Area
Previous Surveys
Site File Search Boundary
0 1,000 2,000 feet
0 250 500 meter
1 inch = 2000 feet
N
SWCA ENVIRONMENTAL CONSULTANTS
Map Source: Copyright:© 2013 National Geographic Society, i-cubed; USGS 7.5' Quad: Somerton
2007-569.ASM
2000-711.ASM
2003-267.ASM
1997-82.ASM
1992-262.ASM
BLM-320-1996-018
1985-193.ASM
Somerton Quad.
South of Somerton Quad.
YUMA DESERT
YUMA NO 4 AIRFIELD
THURMAN LATERAL
LENT
MAIN CANAL
EAST
4WD
R 24 W
R 23 W
Drill Hole
Well

Appendix D

Coordination and Public Involvement

September 9, 2016

Interested Parties (See Distribution List)

Subject: Issue Scoping Request for the Rolle Airfield Contract and License for Airport Purposes proposed by the Yuma County Airport Authority
ADOT Grant Number: E5S2Z

Dear Sir/Madame:

This letter is to inform you that the Yuma County Airport Authority wishes to renew its contract and license for airport purposes at the Rolle Airfield with the Bureau of Reclamation's (BOR) Yuma Area Office. To facilitate the renewal, an environmental assessment is being prepared.

Rolle Airfield has been serving general aviation in Yuma County for over 60 years. Originally designated as Auxiliary Field No. 4 (AUX 4), the 640-acre site was acquired by the War Department in 1942 (according to a 1991 Army Corps of Engineers report) to build one of 7 satellite airfields for Yuma AAF, which conducted primary flight training & training of bomber aircrews. From 1942-1943, the military built two runways, a taxiway, a parking apron, and an operations building. The runways were constructed with a 2-3" layer of oiled sand over native sand. Rolle Field was declared surplus in 1945, and relinquished to the Department of Interior in 1947. On March 17, 1952, the BOR provided Yuma County a license to operate, maintain, and manage Rolle Field. In 1966, the Yuma County Farm Bureau assumed responsibility for the airfield since the primary beneficiaries in the area would be farmers and growers, and the related crop dusting operations. The Yuma County Airport Authority (YCAA), which was established in 1966 to administer Yuma International Airport, took responsibility of Rolle Field on February 24, 1972. Rolle Airfield (Airport) is managed by the YCAA. The YCAA currently manages, on behalf of the County of Yuma, a contract and license agreement with the BOR to operate and maintain the 640-acre Airport. The Airport today is a general aviation airport located approximately 12 miles southwest of the City of Yuma, Arizona. The Airport supports general aviation users in Yuma County and the customers of Yuma International Airport's aerospace industrial base, which supports government, civilian, and military operations. Yuma International Airport and Rolle Airfield are managed by the Airport Director with guidance of an 11-member Board of Directors.

Because the Proposed Action is located on Reclamation-managed land it is subject to review and determination under NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500 et seq.) and Reclamation's NEPA Handbook (Reclamation February 2012). Reclamation is considering the issuance of a license to operate and maintain an airport on the following-described lands of the United States in the County of Yuma, State of Arizona:

- Section thirty-five (35), Township ten (10) South, Range twenty-four (24) West, Gila and Salt River Meridian, Arizona.

Rolle Airfield lies within Bureau of Reclamation land commonly referred to as "5-Mile Zone Protection and Regulatory Pumping Unit (PRPU)." The 5-mile zone is a 5-mile-wide, 13-mile-long strip of land about 12 miles south of Yuma, Arizona in the extreme southwestern part of the State.

2345 S. Alma School Road, Suite 208 Mesa, AZ 85210
T: 602.803.7079 | F: 480.632.0760
Grand Junction, CO | Denver, CO | Phoenix, AZ | Albuquerque, NM
www.armstrongconsultants.com

Project Objectives

The YCAA's Proposed Action is needed to improve and enhance safety at Rolle Airfield. As part of the planning process, the Authority developed a vision and goals for the Rolle Airfield. The Master Plan published in 2015 includes the following objectives:

- Develop a plan that preserves public and private investments
- Develop a plan that is reflective of community goals and objectives
- Develop a plan that takes advantage of the current trends in the aviation industry toward Unmanned Aircraft Systems (UAS)
- Develop a plan that maintains safety
- Develop a plan that preserves the environment
- Develop a plan that strengthens the economy

To achieve the objectives established in the Master Plan several projects are proposed to be constructed over the 20-year planning period. The planned projects include constructing additional airfield pavement, lighting, navigational aids, fencing, aircraft hangars, and other associated support facilities. It should be noted that all future proposed projects will be constructed within the existing Rolle Airfield property. The proposed future runway extension will occur on existing airport property, however, land acquisition at both ends of Runway 17-35 will be needed to accommodate future runway protection zones.

Enclosed is a copy of the 2015 Airport Layout Plan depicting the proposed project area. If you have any questions or comments, or would like to be placed on the mailing list for this project, please contact Mr. Nicholas Heatwole, Environmental Specialist, at 928-343-8111 or by email at nheatwole@usbr.gov. Although comments are accepted through the National Environmental Policy Act process, we encourage written comments specific to this scoping letter be provided by October 10, 2016.

Sincerely,

Charlie McDermott, LEED AP
Senior Airport Project Manager

Cc: Mark Workman, Yuma County Airport Authority
Julian DeSantiago, Bureau of Reclamation – Yuma Area Office
Scott Driver, ADOT-Aeronautics Group
Jenny Watts, Armstrong Consultants, Inc.

Enclosures: Proposed Project Area Map; 2015 ALP

Distribution List

Ms. Jessica Gwinn
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
9828 North 31st Avenue
Phoenix, Arizona 85051-2517

Mr. Bill Knowles
Region IV – Yuma
Arizona Game and Fish
Department
9140 East 28th Street
Yuma, Arizona 85365

Mr. John MacDonald
Field Manager,
Bureau of Land Management,
Yuma Field Office
7341 E. 30th Street
Yuma, Arizona 85365

Mr. Cary Meister
Yuma Audubon Society
P.O. Box 6395
Yuma, Arizona 85364

Cultural Resources Manager
Quechan Indian Tribe
P.O. Box 1899
Yuma, Arizona 85366

Mr. Tim Bolton
AZ State Land Department
1616 West Adams Street
Phoenix, Arizona 85007

Mr. Sergio Obregon
NEPA Coordinator
Department of the Army
Yuma Proving Grounds
301 C Street, IMYM-PWE
Yuma, Arizona 85365-9498

Ms. Jill McCormick
Cultural Resources Manager
Cocopah Indian Tribe
14515 South Veterans Drive
Somerton, Arizona 85350

Mr. Frank Sanchez
Senior Civil Engineer,
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Department of Development
Services,
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Yuma, Arizona 85364

Mr. Dave Rodriguez
Environmental Director
Environmental Department
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Mr. Ronald Kruse
Public Works Director
I&L Engineering Division
Marine Corp Air Station Yuma
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Yuma, AZ 85369-9140

Ms. Jenny Torres
Community Development
Director
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San Luis, AZ 85349

Mr. Bill Lee
City Administrator
PO Box 638
110 N. State Avenue
Somerton, AZ 85350

Ms. Carmen Juarez
Community Development
PO Box 638
110 N. State Avenue
Somerton, AZ 85350

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Imperial County
Fort Yuma Indian Reservation
CALIFORNIA
ARIZONA
COLORADO RIVER
BAJA CALIFORNIA NORTE
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1st St.
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16th St.
County 10th St.
County 11th St.
24th St.
32nd St.
Avenue B
4th Ave
US 95
County 9th St.
Yuma
Somerton Ave
Avenue D
Avenue C
Avenue A
Avenue G
Yuma International Airport
Avenue 3 E
Avenue 4 E
Avenue 5 E
Avenue 6 E
95
County 14th St.
County 15th St.
County 16th St.
County 17th St.
US 95
Somerton
Somerton Airport
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Somerton Ave
Avenue B
Gadsden
County 19th St.
Rolle Airfield
US 95
195
San Luis
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San Luis POE II
Commercial Traffic
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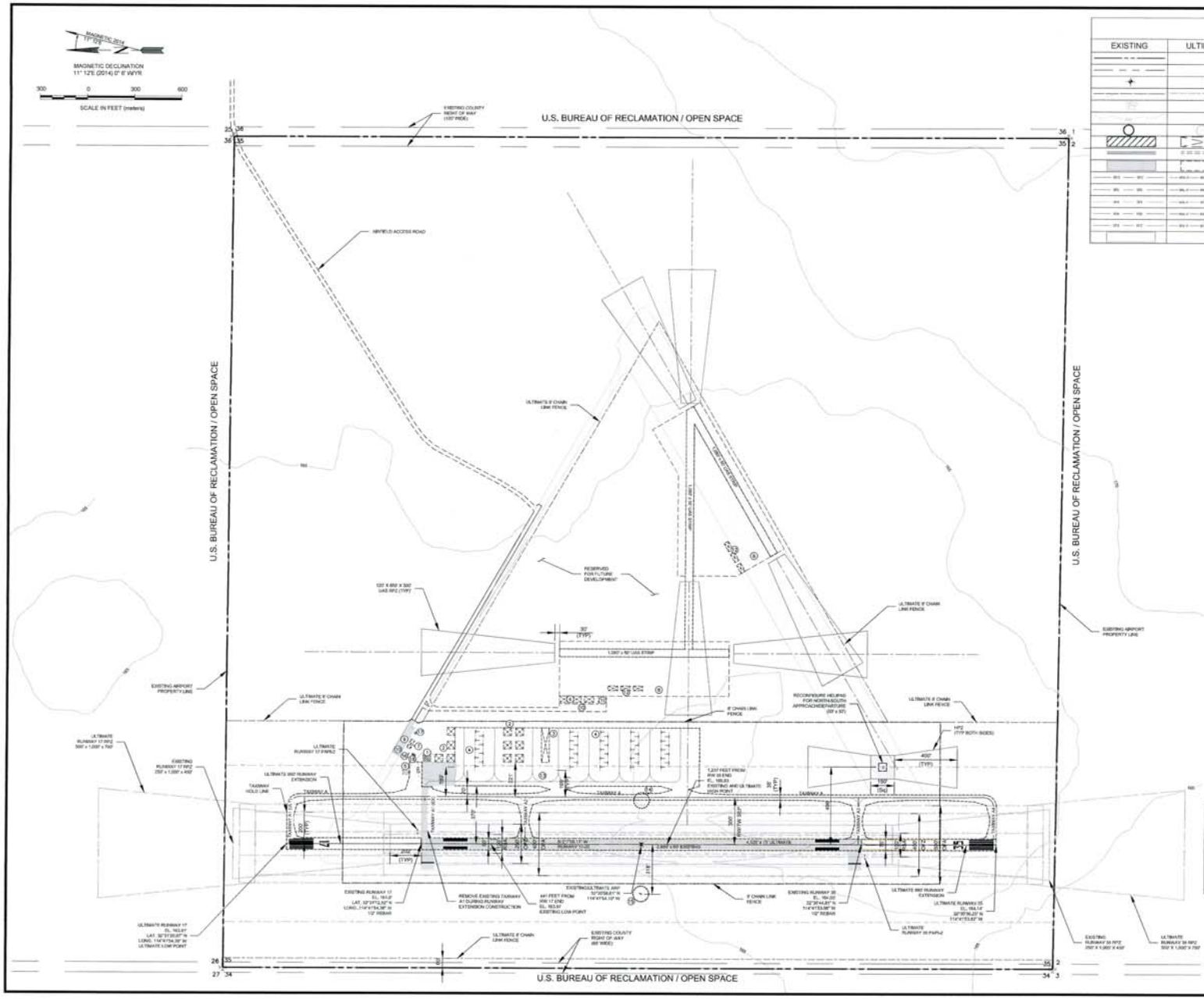
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U.S. BUREAU OF RECLAMATION / OPEN SPACE
AIRFIELD ACCESS ROAD
RESERVED FOR FUTURE DEVELOPMENT
EXISTING AIRPORT PROPERTY LINE
ULTIMATE 8' CHAIN LINK FENCE
TAXIWAY A
TAXIWAY B
TAXIWAY C
TAXIWAY D
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TAXIWAY A1
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Yuma County Airport Authority
Rolle Field Environmental Assessment

Project Kick-off Meeting

March 8, 2016
Yuma International Airport

ADOT No. E5S2Z

MEETING SUMMARY

Purpose: Provide all entities the opportunity to meet in person for the first time as a group to discuss the project and review the scope for the environmental assessment (EA) for Rolle Field.

Attendees:

Name	Organization
Gladys Wiggins	Yuma International Airport
Gerald Hinkle, Jr.	Yuma International Airport
Mark Workman	Yuma International Airport
Gen Grosse	Yuma International Airport
Chris Moreno	Bureau of Reclamation
Nick Heatwole	Bureau of Reclamation
Julian DeSantiago	Bureau of Reclamation
Destiny Johnson	Bureau of Reclamation
Chris Wallis	Bureau of Reclamation
Scott Driver	ADOT Aeronautics
Matt Smith	ADOT Aeronautics
Charlie McDermott	Armstrong Consultants, Inc.
Jenny Watts	Armstrong Consultants, Inc.
Mary Ortega-Itsell	Genesis Consulting Group
Richard Crosman	Genesis Consulting Group
Ryan Rausch	SWCA Environmental

Synopsis:

A brief welcome was conducted by Ms. Gladys Wiggins, Airport Director, for the Yuma County Airport Authority. This was followed by a welcome from Mr. Charlie McDermott, Senior Airport Project Manager, for Armstrong Consultants, Inc., along with introductions from all others in attendance.

Charlie turned it over to Mr. Richard Crosman, Senior Vice President, of Genesis Consulting Group who provided a general overview of the Rolle Field Airport Master Plan which was recently completed in May 2015. Most notably, Mr. Crosman pointed out as a result of the master plan, one potential use of Rolle Field may include unmanned aerial systems (UAS), also known as drones. He briefly spoke to the four development alternatives that also came out of the master plan, including the preferred alternative that was selected. Likewise, a recap of Rolle's capital improvement plan and proposed projects over the course of the planning period was mentioned. Lastly, Mr. Crosman and Mr. McDermott described the Airport Layout Plan (ALP) and the Exhibit A Property Map and why each is important in this project. Both the ALP and Exhibit A Property Map will be referenced in the EA.

The next agenda item discussed pertained to the environmental resources and potential impacts. Mr. Ryan Rausch, Environmental Planner, from SWCA Environmental gave an outline of his responsibilities for the project along with a timeline. Mr. Rausch and his team will be conducting a biological and archeological survey of approximately 132 acres of land; it was noted by Mr. Rausch that the 132 acres is the amount of land with the most potential for disturbances, and does not include the entire leased property of Rolle Field. Mr. Rausch indicated that he and his team would be following the NEPA process for the biological assessment, and he briefly described some of the resource categories this includes. As far as a schedule for the survey, he indicated he would need about a one-week notice, and then one full day at the airfield for the biological survey. A representative from the Bureau of Reclamation will be providing the Bureau's archeologist (who is located in Nevada) contact information to Mr. Rausch. When Mr. Rausch indicated that he and his team could possibly conduct the biological survey the following week, another representative from the Bureau of Reclamation suggested in order to observe one of the potentially threatened species (flat-tailed horned lizard) that are known in the area, his team may have to wait until April or May when the weather warms up and the species is known to be present. Mr. Rausch also spoke about the archeological survey; it will be a Class-III pedestrian survey and will take approximately two days to complete. He hopes that his team will be able to complete the survey at the same time as the biological survey. His team will also complete a minor air quality analysis for the report; however, it would involve no site survey or modeling, and would be more qualitative in nature within the report. It was agreed upon by the group that SWCA will send the biological and archeological reports to the Bureau for review upon their completion.

At this point, a general discussion on the timeframe for the EA was discussed. Pending the final reports by SWCA, Mr. McDermott believes a first draft of the EA may be available sometime this summer. A short discussion on stakeholders also took place. The Bureau, in conjunction with the Yuma County Airport Authority, has a record of the interested stakeholders for this project. Armstrong will draft a letter on behalf of the Bureau and Airport Authority to send to the stakeholders. Mr. McDermott informed the attendees that a public hearing is included in Armstrong's scope of work. It was agreed that the need for and format of a public hearing will be discussed again later in the process. It was also agreed that the Bureau of Reclamation will be the lead agency for the EA; ADOT will be a cooperating agency. Finally, after the review period for the draft EA, Armstrong will also draft the Finding of No Significant Impact (FONSI) statement on behalf of the Bureau of Reclamation for signature. The group had no other questions at this time.

The meeting began at 10:00 am was adjourned at 11:20 am. A copy of the meeting attendee list is attached hereto and made a part hereof.

Meeting Sign-In Sheet

Project: Rolle Airfield EA kick-off meeting	**Meeting Date:**	March 8, 2016 (10:00 am – 11:30 am)

Name	Affiliation/Company	Phone	E-mail
Charlie McDermott, LEED AP	Armstrong Consultants, Inc.	602-803-7079	cmcdermott@armstrongconsultants.com
Jenny Watts	Armstrong Consultants, Inc.	602-803-7079	jwatts@armstrongconsultants.com
SCOTT DRIVER	ADOT AERONAUTICS	602-712-8386	sdriver@azdot.gov
Chris Moreno	Bureau of Reclamation	928-343-8306	cmoreno@usbr.gov
Nick Heatwole	Reclamation	928-343-8111	nheatwole@usbr.gov
MAM SMITH	ADOT Aeronautics	~~928~~ 602-712-7597	MSmith3@azdot.gov.
Julian DeSantiago	RECLAMATION	928-343-8259	JDESANTIAGO@USBR.GOV
Destiny Johnson	Reclamation	928-343-8118	dmjohnson@usbr.gov
Chris Wallis	Reclamation	928-343-8215	cwallis@usbr.gov
Ryan Rausch	SWCA Environmental	602 274 3831	rrausch@swca.com
Gladys Wiggins	Yuma International Airport	928-724-5882	gladys@yumaairport.com
Gerald Hinkle, Jr.	"	"	junior@yumaairport.com

Meeting Sign-In Sheet

Project: Rolle Airfield EA kick-off meeting	**Meeting Date:**	March 8, 2016 (10:00 am – 11:30 am)

Name	Affiliation/Company	Phone	E-mail
Mark Workman	Yuma International Airport	928-726-5882	mark@yumaairport.com
Gen Grosse	"	"	gen@yumaairport.com
Mary Ortega-Itsell (via telephone)	Genesis Consulting Group	(210) 488-1019	mary@Genesis-Aviation.com
Richard Crossman (via telephone)	Genesis Consulting Group	(970) 209-5117	Rick@Genesis-Aviation.com

AFFP

NOTICE OF PREPARATION OF AN EN

Affidavit of Publication

STATE OF ARIZONA }
COUNTY OF YUMA } SS

Lisa Reilly or Kathy White, being duly sworn, says:

That she is Publisher or Business Manager of the Yuma Sun, a daily newspaper of general circulation, printed and published in Yuma, Yuma County, Arizona; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

March 01, 2017

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

Publisher or Business Manager

Subscribed to and sworn to me this 1st day of March 2017.

Virgen P. Perez, Notary, Yuma County, Arizona

My commission expires: May 10, 2017

OFFICIAL SEAL
VIRGEN P. PEREZ
Commission # 163644
Notary Public - State of Arizona
YUMA COUNTY
My Comm. Expires May 10, 2017

00023439 00115985 4806320760

ARMSTRONG
2345 S. Alma School Road, Ste 208
Mesa, AZ 85210

NOTICE OF PREPARATION OF AN ENVIRONMENTAL ASSESSMENT
U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION
YUMA COUNTY AIRPORT AUTHORITY

The Bureau of Reclamation (Reclamation) is issuing an environmental assessment (EA) for public review and comment for the Yuma County Airport Authority's (YCAA) proposed contract and license renewal for airport purposes at the Rolle Airfield with the Reclamation's Yuma Area Office.
The YCAA will host a public open house at the Yuma International Airport on March 23rd, 2017 from 5:00 pm to 7:00pm.

In addition to the public open house, the Reclamation's Yuma Area Office is inviting public input into the EA process. The public can submit written comments to the Bureau of Reclamation by mail: Bureau of Reclamation Yuma Area Office 7301 Calle Agua Salada, Yuma, AZ 85364.

Additional information concerning the Environmental Assessment can be found online at:

https://www.usbr.gov/lc/yuma/environmental_docs/environ_docs.html
http://www.rollefield.com

The 30-day public review period will end on March 30, 2017.

For additional information regarding the project, contact Reclamation's Nick Heatwole at 928-343-8111, or email at nheatwole@usbr.gov.

Comments received in response to this notice, including names and addresses of those who comment will be considered part of the public record for this project and will be available for public inspection and will be released if requested under the Freedom of Information Act.
Daily March 1, 2017 - 00115985

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Public Open House Sign-In Sheet

Rolle Airfield Environmental Assessment
Public Open House
ADOT No. E5S2Z

Meeting Date:
March 23, 2017 (5:00 to 7:00 pm)

Name	Affiliation/Company	Phone	E-mail
Charlie McDermott, LEED AP	Armstrong Consultants, Inc.	602-903-5013	cmcdermott@armstrongconsultants.com
Matt Tomasson	Armstrong Consultants, Inc.	602-903-5028	mtomasson@armstrongconsultants.com
JUNIOR HINKLE	YCAA	9287265882	JUNIOR@YUMAAIRPORT.COM
Gen Grosse	YCAA	928-726-5882	gen@yumaairport.com
Gladys Wiggins	YCAA	928-726-5882	gladys@yumaairport.com
Mark Smith	ADOT	602-712-7597	msmith3@azdot.gov
Mark Workman	YCAA	928 9192388	mark@yumaairport.com

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Rolle Airfield

Draft Environmental Assessment
Public Open House

March 23, 2017
5:00 – 7:00pm

ARMSTRONG

Purpose and Agenda

Purpose: Provide an overview of the Rolle Airfield Environmental Assessment (EA), discuss the environmental assessment process, and receive public feedback

Agenda:

- Background
- Project Overview
- Proposed Action
- Environmental Policies
- Environmental Assessment Process
- Q&A

Source: Armstrong Consultants, Inc., 2016

Consultant Team

ARMSTRONG

SWCA

GENESIS

Background

Rolle Airfield:

- General Aviation airport
- Located northeast of the City of San Luis
- Originally constructed as an Auxiliary Airfield for the Army Air Force in 1942
- Located on Bureau of Reclamation (BOR) managed land
- 1973 Licensed by the BOR to Yuma County to operate, maintain and manage
- Yuma County's license with BOR was renewed for 25 years in 2009

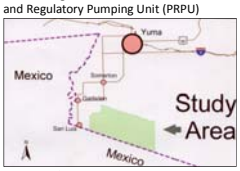
Source: Morrison-Maierle, 2015

Background

Rolle Airfield:

- The Yuma County Airport Authority (YCAA) currently manages, on behalf of the County of Yuma, the contract license agreement with the BOR to operate and maintain the airport
- The BOR is considering the renewal of a license to operate and maintain the Rolle Airfield
- Airport is located on BOR managed land and is subject to review under the National Environmental Protection Act (NEPA) and the BOR's NEPA Handbook

BOR Managed Land: 5-Mile Zone Protection and Regulatory Pumping Unit (PRPU)



Source: Bureau of Reclamation

NEPA Environmental Assessment Process

- In accordance with NEPA and BOR guidelines, the following environmental resource elements, were evaluated as part of this EA:
  - Aesthetics (Minimal Impact)
  - Air Quality (Minimal Impact/Temporary)
  - Biological Resources (Minimal Impact)
  - Cultural/Historic Resources (No Impact)
  - Geology and Soils (Minimal Impact/Temporary)
  - Hazardous and Solid Waste (Minimal Impact/Temporary)
  - Water Resources (Minimal Impact)
  - Land Use/Ownership (Minimal Impact)
  - Noise (Minimal Impact)
  - Indian Trust Assets (No Impact)
  - Socioeconomics (No Impact)
  - Environmental Justice (No Impact)
- Each resource element was evaluated to determine the potential adverse and beneficial effects for both the **Proposed Action** and **No-Action** alternatives to the environment.

Project Overview

The Arizona Department of Transportation (ADOT) is funding the preparation of the EA: ADOT Grant No. E5S2Z

What will this EA do?

- The Rolle Airfield EA summarizes the potential environmental effects of implementing the projects identified in the 2015 Airport Master Plan (Master Plan) and the approved Airport Layout Plan (ALP) for the purpose of the YCAA renewing its license agreement with the BOR.

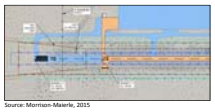
What will this EA not do?

- The EA is not seeking environmental clearance for the development as depicted in the Master Plan.
- Proposed projects identified in the Master Plan will have separate environmental clearance documentation.

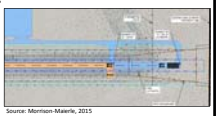
Planned Projects

Rolle Airfield will be developed in a logical and phased manner over a 20-year period. The anticipated development projects are:

- Runway and Taxiway Improvements
  - Extension of Runway 17-35 to 4,520 feet
  - Construction of 35-foot wide parallel taxiway and connecting exit taxiways
  - Install an airport rotating beacon
  - Install medium intensity runway lights (MIRL), runway threshold lights, and precision approach path indicators (PAPI-2s)
  - Reapply basic centerline and runway designation markings and holding positions
  - Apply centerline and edge markings to parallel taxiway
  - Install medium intensity taxiway lights
  - Implement GPS approach to Runway 17
  - Install lighted supplemental wind cones



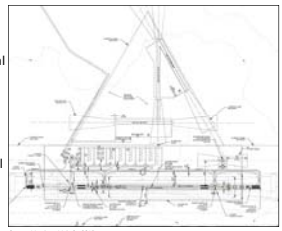
Source: Morrison-Maierle, 2015



Source: Morrison-Maierle, 2015

Planned Projects

- Apron and Terminal Area Improvements
  - Expand aircraft parking apron, add conventional hangars, T-hangar positions, and aircraft tie-down positions
  - Reserve space for general aviation / terminal facility
  - Reserve airport property parcels for future aviation related and non-aviation related uses
- Easements
  - Obtain easements to ensure positive control of the RPZs
- Other Improvements
  - Construct airfield access roads
  - Reserve an area for a future fueling facility
  - Extend airfield perimeter fence to enclose future UAS development



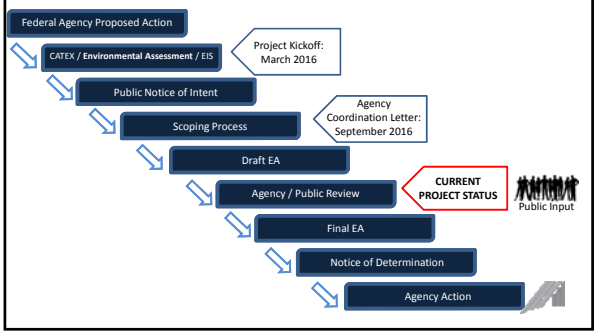
Source: Morrison-Maierle, 2015

National Environmental Policy Act (NEPA)

- The process is required when a federal agency develops a proposal to take federal action
- Includes three types of analysis:
  - Categorical Exclusion (CATEX)
  - **Environmental Assessment (EA)**
  - Environmental Impact Statements (EIS)
- The NEPA process provides public review periods and public hearings to allow input in the decision process

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the United States Department of the Interior's Bureau of Reclamation guidelines

NEPA Environmental Assessment Process



Public Participation

- A copy of the Draft Environmental Assessment has been provided for public review from March 1, 2017 through March 30, 2017 at multiple locations:
  - Yuma County Administrator's Office
  - Yuma County Main Library
  - Yuma County San Luis Library
  - Yuma International Airport
  - BOR's Yuma Area Office
  - BOR's website
  - Yuma International Airport's website
- Public notice of the EA was published in the Yuma Sun Newspaper on March 1, 2017
- Opportunities for additional public input
  - You can participate by submitting written comments at this presentation
  - Written comments may also be submitted by mail to: Bureau of Reclamation Yuma Area Office 7301 Calle Agua Salada, Yuma, AZ 85364, Attention: Mr. Juian DeSantiago
- Public comment period ends on March 30, 2017

Next Steps

- Gather all public input
- Revise the Draft EA, as applicable
- Submit the Final EA Report for review and approval to:
  - ADOT
  - BOR
  - Yuma County Airport Authority

Questions

Q&A

Project Contact Information

- Mark Workman, Director of Operations
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  - 928-919-2388
- Charlie McDermott, LEED AP, Project Manager
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  - 602-903-5013

Appendix E

Comments Received During Public Comment Period

YUMA AUDUBON SOCIETY
P.O. BOX 6395
YUMA, ARIZONA 85366-6395

March 30, 2017

VIA EMAIL

Mr. Julian DeSantiago
Environmental Planning and Compliance Office
Bureau of Reclamation
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Charlie McDermott
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Armstrong Consultants, Inc.
2345 S. Alma School Road, Suite 208
Mesa, AZ 85210
cmcdermott@armstrongconsultants.com

Re: ADOT Grant No. E5S2Z
Rolle Airfield Draft Environmental Assessment

Dear Mr. De Santiago and Mr. McDermott:

Please accept the following comments on the "DRAFT Environmental Assessment: Rolle Airfield, San Luis, Arizona" (hereafter EA or "the EA") on behalf of the Yuma Audubon Society.

The Yuma Audubon Society (YAS, Yuma Audubon) is a non-profit 501(c)(3) chapter of the National Audubon Society. With approximately 130 members in Yuma, La Paz, and Mohave Counties in Arizona, Yuma Audubon provides educational and recreational opportunities through seasonal monthly meetings, field trips, bird walks, and programs in the community and schools. Yuma Audubon also is committed to conservation and environmental protection and frequently participates in public input processes offered by governmental agencies at the national, regional, state, and local levels, including commenting on agency proposals like this one. Our members enjoy visiting the public lands in the Yuma to Kingman area and are deeply concerned with the protection of their environmental and cultural values. Yuma

Audubon members have visited the vicinity pof the Rolle Airfield for both recreational and educational purposes and have a long-standing interest in the welfare of the Flat-tailed Horned Lizard.

We understand that this environmental assessment would only authorize continuation of the contract and license agreement between the Bureau of Reclamation and the Yuma County Airport Authority to operate Rolle Airfield at its current level of use and would not authorize any of the projects envisioned in the Final Rolle Airfield Airport Master Plan (FRAMP) or any other projects. However, much of the justification for the purpose and need for the present action references future developments, rather than current use. There is very little information on how the airfield is currently being used to justify continuation of the contract and license agreement. Given the difficult land access to the airfield in case of an accident, we have to question whether its current purpose and proposed future developments would better be served by a location in an area with better land access and less sensitivity of wildlife and plants. The number of projects proposed for the airfield would definitely have a noticeable impact on the area, including runway and taxiway lights, 24-hour operations, larger airplanes using the facility, the introduction of drone traffic, paving roads, extending and greatly increasing electrical service, a fuel facility, and so on (EA, 2.2.2 Proposed Action, pp. 2-3 to 2-7).

We are also confused by the statement in the EA in 3.1, "Aesthetics" (p. 3-1), which references the City of Yuma's metropolitan planning objectives in relation to the airfield, yet elsewhere (EA 2.1, "History and Location"; p. 2-1) it is stated that the airfield is part of the City of San Luis through annexation. Please clarify jurisdiction and planning scope of the Rolle Airfield as part of the EA.

In 3.2.1 of the EA (p. 3-3), it is stated that the airfield is within the PM_{10} nonattainment area for Yuma County. This would argue against use of the airfield for the proposed uses in the FRAMP because of the greater disturbance that these expanded operations would cause.

Our greatest concern is the potential impacts of the FRAMP's proposed actions on the Flat-tailed Horned Lizard (FTHL). The EA correctly identifies the subject area as existing FTHL habitat and recommends a number of mitigating actions if the airfield is expanded in line with the FRAMP. However, we feel that these actions do not adequately protect the FTHL. As the EA states (p. 3-15): "The project area is withing the southwestern population of the species and is *just west of the Yuma Desert Management Area* [our emphasis]." As much as 50% of the Flat-tailed Horned Lizard's habitat in the United States is likely lost to agricultural and residential development (Flat-tailed Horned Lizard Interagency Coordinating Committee. 2016: 4). There is no more land within the Yuma Management Area which can be purchased for further losses of FTHL habitat in Arizona. If the projects envisioned in the FRAMP are to occur, it is time to expand the boundaries of the Yuma Management Area to obtain the best available FTHL habitat outside the Yuma Management Area boundaries and restore that habitat so it is optimal for FTHL survival and recovery. The lands indicated in Rorabaugh, Palermo, and Dunn (1987:104, Figure 1) would be a good place to start.

We question whether the Curve-billed Thrasher is likely to be found in the subject area on a regular basis (EA, 3.3.1, "Affected Environment," p. 3-15. Henry Detwiler, probably the

most active and experienced birder in Yuma County, lists this species as uncommon in spring, summer, and fall, and not occurring at all in winter (Detwiler 2016).

Thank you for the opportunity to comment on this proposal.

Sincerely,

Conservation Chair

REFERENCES CITED

Detwiler, Henry. 2016. *Yuma County Bird Checklist. Latest update: Oct 10, 2016*. Yuma, AZ: Southwest Birders. Accessed March 30, 2017 at www.southwestbirders.com/Yuma_County_Bird_Checklist_2016.pdf.

Flat-tailed Horned Lizard Interagency Coordinating Committee. 2016. *Annual Progress Report: Implementation of the Flat-tailed Horned Lizard Rangewide Management Strategy January 1, 2015 - December 31, 2015*. Accessed March 30, 2017 at https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/FTHL/FTHLICC_2015_annual%20report_FTHL%20RMS,%20Jan-Dec%202015.pdf.

Rorabaugh, James C., Carolyn L. Palermo, and Steven C. Dunn. 1987. Distribution and Relative Abundance of the Flat-tailed Horned Lizard (*Phrynosoma mcallii)* in Arizona. *The Southwestern Naturalist*32(1):103-109.

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