

FINAL



**Supplemental Environmental Assessment
for Proposed U.S. Customs and Border Protection
Permanent Air and Marine Facility at Libby Army Airfield
Fort Huachuca, Arizona**

October 2022





**FINAL
FINDING OF NO SIGNIFICANT IMPACT (FONSI)
PERMANENT AIR AND MARINE FACILITY AT LIBBY ARMY AIRFIELD
FORT HUACHUCA, ARIZONA**

INTRODUCTION: United States (U.S.) Customs and Border Protection (CBP) Air and Marine Operations (AMO) plans to construct and operate a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona. CBP AMO would also demolish existing temporary facilities following construction, subject to the availability of funding. The facility would be designed and constructed in accordance with Fort Huachuca and LAAF guidance and regulations. CBP AMO has prepared this Supplemental Environmental Assessment (SEA) to address the potential effects, beneficial and adverse, resulting from the proposed construction and operation of the aforementioned facility. CBP AMO has operated at LAAF on Fort Huachuca since 1999, providing support to the U.S. Border Patrol's (USBP) Tucson Sector mission to gain operational control of the border. LAAF is located in the north-central portion of Fort Huachuca and LAAF is one of 21 joint-use airports in the country where military runways also are used by a public airport, the Sierra Vista Municipal Airport (SVMA).

CBP AMO staff at LAAF currently work with Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in Search and Rescue (SAR) operations. Currently, CBP AMO operations at LAAF include the Sierra Vista Air Unit (SVAU) and the unmanned aircraft systems (UAS) operations, which were deployed in 2005. The proposed permanent facilities support the Border Patrol Strategy to gain and maintain effective control of the borders of the U.S. In 2003, the legacy Immigration and Naturalization Service (INS) prepared an *Environmental Assessment (EA) for the Expansion of U.S. Border Patrol Air Operations and Facilities, U.S. Border Patrol Tucson Sector, Arizona*. That EA evaluated four alternatives, three of which were located on the north side of LAAF, within or adjacent to the SVMA. The SEA for this project will be tiered from the 2003 EA.

PROJECT LOCATION: Fort Huachuca is located in Cochise County just west of the City of Sierra Vista, Arizona. The project is located approximately 70 miles southeast of Tucson, Arizona and 15 miles north of the U.S. – Mexico International Border (Figure 1-1).

PURPOSE AND NEED: The purpose of the Proposed Action is to establish a joint permanent air operations facility at LAAF, Fort Huachuca, Arizona, to support the USBP's Tucson Sector mission to manage operational control of the border. CBP AMO provides air support to USBP Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in SAR operations.

CBP obtained a permit for temporary use of land from the Department of the Army for their current location at LAAF in 2006, which expired in September 2016. As a result, CBP is actively pursuing permanent facility solutions for AMO's Air Unit (AU) and National Air Security Operations Center (NASOC) operations in order to accommodate and continue mission operations.

The Proposed Action is needed to provide sufficient land with access to a taxiway that will allow support of current and additional manned and un-manned aircraft operations. The facility will need to have the capacity to accommodate eight aircraft (five existing aircraft and three additional aircraft) and 100 personnel (47 existing personnel and 53 additional personnel). At a minimum, the facility would require hangars, support buildings, and vehicle and aircraft parking as well as associated utilities and ancillary features. The airport and associated airspace must support UAS operations and provide proximity to the U.S. - Mexico Border in the Tucson Sector. CBP proposes continuing use of the current temporary facilities until permanent infrastructure is approved and completed.

ALTERNATIVES: CBP analyzed two alternatives in the SEA. Alternative 1 is the No Action Alternative. Under the No Action Alternative, the proposed construction of a permanent joint air facility would not take place. In the absence of the permanent joint air facility, CBP AMO operations would not become more efficient and effective. The No Action Alternative does not meet the purpose and need for this project.

Alternative 2 is the Proposed Action. The Proposed Action would include improvements and repairs to the current temporary facility as well as the construction of a new Joint Permanent Air Facility. The Proposed Action also includes demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding.

ENVIRONMENTAL CONSEQUENCES: The Proposed Action would have negligible impacts on land use and it is not anticipated to have direct or indirect impacts on land use within the surrounding area (i.e. the San Pedro Riparian National Conservation Area). The Proposed Action is consistent with existing and future land uses (airfield) identified in Fort Huachuca's Real Property Master Plan Update.

Minor and permanent impacts to soils, and negligible impacts on vegetative habitat and wildlife would occur as a result of disturbing up to 13 acres for the construction and improvement of the joint air facility. The proposed site is already disturbed from previous airport improvement activities and contains no unique vegetative habitat. Best management practices (BMPs) such as dust suppression with water and erosion control measures would be implemented during construction. A Stormwater Pollution Prevention Plan (SWPPP) would also be prepared prior to construction activities and would include pre-and post-construction measures.

The Proposed Action would not directly or indirectly impact any surface waters or waters of the U.S. as none are located within the project area. In addition, due to water mitigation measures, there will be no significant impact to groundwater as a result of the current staffing levels or the Proposed Action. In 2015, CBP acquired a 210.60 acre-feet (AF) per year (YR) conservation easement on the 1,912 acre Flying H Ranch in Cochise County, Arizona as a water conservation measure to offset effects (from staffing at CBP facilities at Fort Huachuca and throughout the Sierra Vista subwatershed) to regional groundwater and flows in the Babocomari and San Pedro rivers. 111.56 AF/YR of this 210.60 AF/YR water conservation easement credit went to mitigate other CBP facilities and staffing outside of Fort Huachuca, which left 99.04 AF/YR of conservation easement credit. Current staffing at LAAF consists of 47 people, with a calculated annual groundwater withdrawal of 16.92 AF/YR, and was mitigated with the remaining 99.04

AF conservation easement credit. This left a credit of 82.12 AF/YR (99.04 AF/YR – 16.92 AF/YR) to address future water mitigation needs. The Proposed Action of 53 additional personnel will use 19.08 AF/Yr and will be mitigated with the existing 82.12 AF/YR surplus conservation easement credit. This reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR).

Eleven Federally listed species have the potential to occur within the project area; ocelot (*Leopardus pardalis*), Mexican spotted owl (*Strix occidentalis*), Desert pupfish (*Cyprinodon macularis*), jaguar (*Panthera onca*), western yellow-billed cuckoo (*Coccyzus americanus*), northern aplomado falcon (*Falco femoralis septentrionalis*), northern Mexican gartersnake (*Thamnophis eques*), Chiricahua leopard frog (*Rana chiricahuensis*), Gila topminnow (*Poeciliopsis occidentalis*), and Huachuca water umbel (*Lilacopsis schaffneriana* ssp. *recurva*). None of the 11 Federally listed species were detected during biological surveys within the project area and there is no suitable habitat within or adjacent to the project area for 10 of the species. The Proposed Action may affect, but is not likely to adversely affect, any of the Federally listed species. U.S. Fish and Wildlife Service concurred with CBP's findings in a April 19, 2022 letter.

No archaeological sites were recorded within the Proposed Action construction boundaries. Four archaeological sites were recorded within a 1-mile radius of the Proposed Action; however, none of these would be affected by the implementation of the Proposed Action.

Temporary, negligible increases in air emissions would occur during construction of the joint air facility and demolition of the temporary facilities. However, BMPs would be implemented to reduce impacts to air quality, and air emissions would be below the Federal *de minimis* thresholds for construction, operation, maintenance, and repair activities.

The Proposed Action would have a negligible beneficial impact on climate as a result of improved efficiency of the proposed facility.

Noise level increases associated with the construction of the permanent air facility would result in temporary, negligible impacts. Construction activities would be located on LAAF, which is not surrounded by residences or any sensitive noise receptors. CBP AMO air operations would expand under the Proposed Action with the addition of one MQ-9 Predator B UAS, one AS-350 A-Star helicopter, and one C-206 fixed-wing aircraft. The addition of these generally quiet aircraft would increase the area exposed to noise levels greater than 65 dBA by 1 acre. No significant noise impacts are anticipated under the Proposed Action.

Minor impacts to utilities would be expected under the Proposed Action. The operation and maintenance of the joint air facility would require a minor increase in utility consumption to support the additional personnel and aircraft. In all, the site is well equipped with existing infrastructure and utilities, with the exception of fiber optics. If deemed desirable for the permanent facility, a fiber optics line would need to be extended from Fort Huachuca's central plant. As a result, minor impacts to existing public services and utilities would be expected to occur.

The construction of the joint air facility on Fort Huachuca and demolition of the temporary structures would have temporary negligible impacts on roadways and traffic. Operation of the facility and the increase of 53 personnel would have a negligible impact on vehicular traffic and would not impede military or civilian ground operations. The Proposed Action would allow for the expansion of CBP AMO air operations and air operations could constitute seven percent of the total flight operations at LAAF and SVMA. This increase in air operations is consistent with ongoing and planned military and civilian air operations and the impacts would be negligible as the existing air space is capable of supporting the increase.

The Proposed Action would have a negligible socioeconomic impact to the surrounding communities. Although the Proposed Action would result in an increase in employment, the increase in jobs represents less than 0.3 percent of Cochise County's current employment levels. The Proposed Action would not result in exposure of the environment or public to any hazardous materials. The construction of the permanent air facility would be consistent with sustainability and greening goals and is not anticipated to result in adverse impacts; several energy and water conservation practices would be incorporated under the Proposed Action. Negligible impacts would be associated with human health or hazardous materials.

BEST MANAGEMENT PRACTICES: BMPs were identified for each resource category that could be potentially affected. Many of these measures have been incorporated as standard operating procedures by CBP in similar past projects. The BMPs are identified in the SEA in Section 5.0 Best Management Practices.

FINDING: On the basis of the findings of the SEA, which is incorporated by reference, and which has been conducted in accordance with the National Environmental Policy Act, the Council on Environmental Quality regulations, and Department of Homeland Security Directive, 023-01, Rev. 01, and Instruction Manual 023-01-001-01, Rev. 01., and after careful review of the potential environmental impacts of implementing the proposal, we find that there would be no significant impact on the quality of the human or natural environments, either individually or cumulatively; therefore, there is no requirement to develop an Environmental Impact Statement. Further, we commit to implement BMPs and environmental design measures identified in the SEA and supporting documents.

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**SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FOR
PROPOSED U.S. CUSTOMS AND BORDER PROTECTION
PERMANENT AIR AND MARINE FACILITY AT LIBBY ARMY AIRFIELD
FORT HUACHUCA, ARIZONA**

October 2022

Project Proponent: Department of Homeland Security
U.S. Customs and Border Protection

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EXECUTIVE SUMMARY

INTRODUCTION

The United States (U.S.) Customs and Border Protection (CBP) Air and Marine Operations (AMO) plans to construct and operate a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona. CBP AMO would also demolish existing temporary facilities following construction, subject to the availability of funding. CBP AMO has prepared this Supplemental Environmental Assessment (SEA) to address the potential effects, beneficial and adverse, resulting from the proposed construction and operation of the aforementioned facility. CBP AMO has operated at LAAF on Fort Huachuca since 1999, providing support to the U.S. Border Patrol's (USBP) Tucson Sector mission to gain operational control of the border. LAAF is located in the north-central portion of Fort Huachuca and LAAF is one of 21 joint-use airports in the country where military runways also are used by a public airport, the Sierra Vista Municipal Airport (SVMA).

CBP AMO staff at LAAF currently work with Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in Search and Rescue (SAR) operations. Currently, CBP AMO operations at LAAF include the Sierra Vista Air Unit (SVAU) and the unmanned aircraft systems (UAS) operations, which were deployed in 2005. The proposed permanent facilities supports the 2020 USBP Strategy to gain and maintain effective control of the borders of the U.S. (CBP 2019a). In 2003, the legacy Immigration and Naturalization Service (INS) prepared an *Environmental Assessment for the Expansion of U.S. Border Patrol Air Operations and Facilities, U.S. Border Patrol Tucson Sector, Arizona* which evaluated four alternatives, three of which were located on the north side of LAAF, within or adjacent to the SVMA (INS 2003). The SEA for this project will be tiered from the 2003 EA.

PROJECT LOCATION

Fort Huachuca is located in Cochise County just west of the City of Sierra Vista, Arizona. The project is located approximately 70 miles southeast of Tucson, Arizona and 15 miles north of the U.S. – Mexico International Border (Figure 1-1).

BACKGROUND

CBP obtained a permit for temporary use of land from the Department of the Army for its current location at LAAF in 2006. Construction of the temporary facility was completed in 2008 and CBP has occupied the temporary facility since December 2008. The temporary permit expired in September 2016. As a result, CBP is actively pursuing permanent facility solutions for AMO's Sierra Vista Air Unit (AU) and National Air Security Operations Center (NASOC) operations in order to accommodate and continue mission operations.

PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to establish a joint permanent air operations facility at LAAF, Fort Huachuca, Arizona, to support the USBP's Tucson Sector mission to manage operational control of the border. CBP AMO provides air support to USBP Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in SAR operations.

NEED FOR THE PROPOSED ACTION

The Proposed Action is needed to provide sufficient land with access to a taxiway that will allow support of current and additional manned and unmanned aircraft operations. The facility will need to have the capacity to accommodate eight aircraft (five existing aircraft and three additional aircraft) and 100 personnel (47 existing personnel and 53 additional personnel). At a minimum, the facility would require hangars, support buildings, and vehicle and aircraft parking as well as associated utilities and ancillary features. The airport and associated airspace must support UAS operations and provide proximity to the U.S. - Mexico Border in the Tucson Sector.

The facility site must have a high level of physical security and 24-hour occupational access will be required to meet mission objectives and protect enforcement assets. The site must be cost effective to improve, and all construction and operations must be consistent with Fort Huachuca Real Property Master Plan and/or City of Sierra Vista Master Plan.

PROPOSED ACTION AND ALTERNATIVES CONSIDERED

CBP analyzed two alternatives in this EA. Under the No Action Alternative (Alternative 1), the proposed construction of a Joint Permanent Air Facility would not take place. The No Action Alternative serves as a basis of comparison to the anticipated effects of the other action alternatives, and its inclusion in the EA is required by National Environmental Policy Act (NEPA) regulations (40 CFR 1502.14(d)). CBP AMO would not have a permanent facility at LAAF; thus, operational efficiency and effectiveness would not be improved within the area. The No Action Alternative does not meet the purpose of and need for this project.

Alternative 2 is the Proposed Action. The Proposed Action would provide improvements and repairs to the current temporary facility located at the southeastern end of LAAF and design and construction of the new permanent facility that will eventually replace the existing temporary facility. The Proposed Action also includes demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidance. It is anticipated that additional staff and aircraft would need to be assigned to LAAF to meet CBP AMO's mission requirements, so additional facilities are proposed for design and construction immediately east and adjacent to the current temporary facilities at LAAF. The new permanent facility would provide sufficient land with access to a taxiway that will allow for development of a facility to support current and future helicopter, fixed wing, and UAS

operations. The facility would have the capacity to accommodate eight aircraft and 100 personnel (47 existing personnel and 53 additional personnel).

ENVIRONMENTAL CONSEQUENCES

The Proposed Action would have negligible impacts on land use and it is not anticipated to have direct or indirect impacts on land use within the surrounding area (i.e. the San Pedro Riparian National Conservation Area). The Proposed Action is consistent with existing and future land uses (airfield) identified in Fort Huachuca's Real Property Master Plan Update.

Minor and permanent impacts to soils, and negligible impacts on vegetative habitat and wildlife would occur as a result of disturbing up to 13 acres for the construction and improvement of the joint air facility. The proposed site is already disturbed from previous airport improvement activities and contains no unique vegetative habitat. Best management practices (BMPs) such as dust suppression with water and erosion control measures would be implemented during construction. A Stormwater Pollution Prevention Plan (SWPPP) would also be prepared prior to construction activities and would include pre-and post-construction measures.

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No archaeological sites were recorded within the Proposed Action construction boundaries. Four archaeological sites were recorded within a 1-mile radius of the Proposed Action; however, none of these would be affected by the implementation of the Proposed Action.

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The Proposed Action would have a negligible socioeconomic impact to the surrounding communities. Although the Proposed Action would result in an increase in employment, the increase in jobs represents less than 0.3 percent of Cochise County's current employment levels. The Proposed Action would not result in exposure of the environment or public to any hazardous materials. The construction of the permanent air facility would be consistent with sustainability and greening goals and is not anticipated to result in adverse impacts; several energy and water conservation practices would be incorporated under the Proposed Action. Negligible impacts would be associated with human health or hazardous materials.

FINDINGS AND CONCLUSIONS

Based upon the analyses of the Environmental Assessment and the BMPs to be implemented, the Proposed Action would not have a significant adverse effect on the environment. Therefore, no further analysis or documentation (i.e., Environmental Impact Statement) is warranted. CBP, in implementing this decision, would employ all practical means to minimize the potential for adverse impacts on the human and natural environments.

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1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

United States (U.S.) Customs and Border Protection (CBP) Air and Marine Operations (AMO) is preparing a Supplemental Environmental Assessment (SEA) that addresses the potential effects, beneficial and adverse, resulting from the proposed construction and operation of a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona. CBP AMO has operated at LAAF on Fort Huachuca since 1999, providing support to the U.S. Border Patrol's (USBP) Tucson Sector mission to gain operational control of the border. LAAF is located in the north-central portion of Fort Huachuca. LAAF is one of 21 joint-use airports in the country where military runways also are used by a public airport, the Sierra Vista Municipal Airport (SVMA).

CBP AMO staff at LAAF currently work with Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in Search and Rescue (SAR) operations. Currently, CBP AMO operations at LAAF include the Sierra Vista Air Unit (SVAU) and the unmanned aircraft systems (UAS) operations, which were deployed in 2005. The proposed permanent facilities support the 2020 USBP Strategy to gain and maintain effective control of the borders of the U.S. (CBP 2019a).

In 2003, the legacy Immigration and Naturalization Service (INS) prepared an *Environmental Assessment for the Expansion of U.S. Border Patrol Air Operations and Facilities, U.S. Border Patrol Tucson Sector, Arizona*. That EA evaluated four alternatives, three of which were located on the north side of Libby Army Airfield, within or adjacent to the SVMA. The SEA for this project will be tiered from the 2003 EA (INS 2003).

1.2 PROJECT LOCATION

Fort Huachuca is located in Cochise County just west of the City of Sierra Vista, Arizona. The project is located approximately 70 miles southeast of Tucson, Arizona and 15 miles north of the U.S. – Mexico International Border (Figure 1-1).

1.3 PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to establish a joint permanent air operations facility at LAAF, Fort Huachuca, Arizona, to support the USBP's Tucson Sector mission to manage operational control of the border. CBP AMO provides air support to USBP Tucson Sector ground units and other law enforcement agencies to interdict foreign national smuggling operations, detect and report other illegal air or ground activities, and engage in SAR operations. CBP obtained a permit for temporary use of land from the Department of the Army for their current location at LAAF. The Department of the Army provided this temporary permit in 2006. Construction of the temporary facility was completed in 2008 and CBP has occupied the temporary facility since December 2008. The temporary permit expired in September 2016.

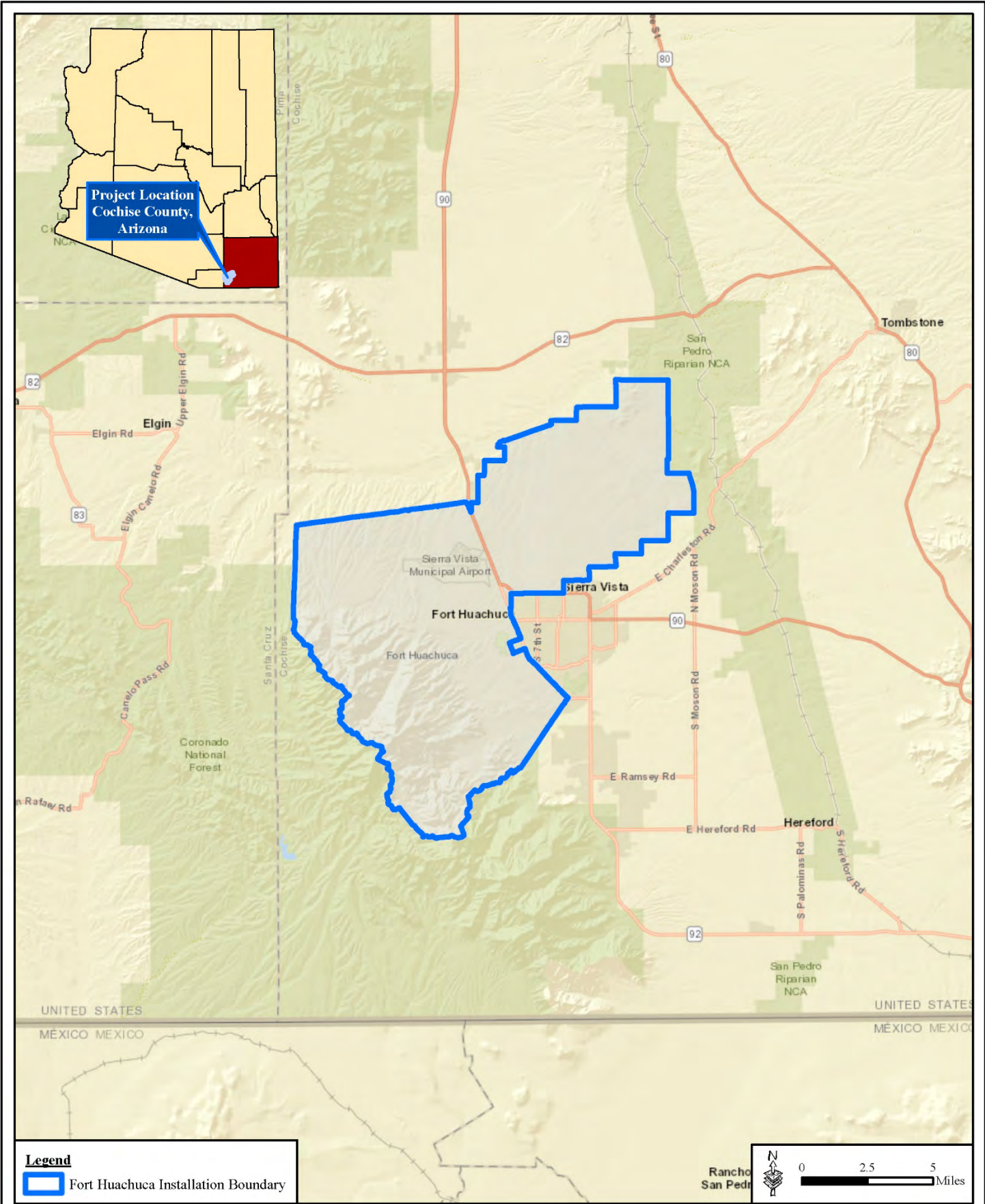


Figure 1-1. Vicinity Map



January 2020

As a result, CBP is actively pursuing permanent facility solutions for AMO's Sierra Vista Air Unit (AU) and National Security Operations Center (NASOC) operations in order to accommodate and continue mission operations.

1.4 NEED FOR THE PROPOSED ACTION

The Proposed Action is needed to provide sufficient land with access to a taxiway that will allow support of current helicopter and UAS operations. The facility will need to have the capacity to accommodate eight aircraft (five existing aircraft and three additional aircraft) and 100 personnel (47 existing personnel and 53 additional personnel). At a minimum, the facility would require hangars, support buildings, and vehicle and aircraft parking as well as associated utilities and ancillary features. The airport and associated airspace must support UAS operations and provide proximity to the U.S. - Mexico Border in the USBP Tucson Sector.

The facility site must have a high level of physical security and 24-hour occupational access will be required to meet mission objectives and protect enforcement assets. The site must be cost effective to improve and all construction and operations must be consistent with Fort Huachuca Real Property Master Plan (RPMP) and/or City of Sierra Vista Master Plan.

1.5 SCOPE OF ENVIRONMENTAL ANALYSIS AND DECISIONS TO BE MADE

The scope of the SEA will include an evaluation of the direct, indirect, and cumulative effects on the natural, cultural, social, economic, and physical environments resulting from the expansion and construction activities associated with establishing a joint permanent air operations facility at LAAF, Fort Huachuca, Arizona. The potentially affected natural and human environment is limited to resources associated with the LAAF area of operation and Cochise County, Arizona. Most potential effects will be limited to the construction site and immediately adjacent resources.

The SEA will document the significance of the environmental effects of the Proposed Action and will look at alternatives that could potentially achieve the objectives of the Proposed Action. The SEA will allow decision makers to determine if the Proposed Action would or would not have a significant impact on the natural, cultural, social, economic and physical environment, as well as whether the action can proceed to the next phase of project development or if an Environmental Impact Statement (EIS) is required. The process for developing the SEA also allows for input and comments on the Proposed Action from the concerned public, interested non-governmental groups, and interested government agencies to inform agency decision making. The SEA will be prepared as follows:

1. Conduct interagency and intergovernmental coordination for environmental planning. The first step in the National Environmental Policy Act (NEPA) process is to solicit comments from Federal, state, and local agencies and Federally recognized tribes about the proposed project to ensure that their concerns are included in the analysis.
2. Prepare a draft SEA. CBP will review and address relevant comments and concerns received from Federal, state, and local agencies or Federally recognized tribes during preparation of the Draft SEA.

3. Announce that the draft SEA has been prepared. A Notice of Availability (NOA) will be published in the *Sierra Vista Herald* newspaper to announce the public comment period and the availability of the Draft SEA and Finding of No Significant Impact (FONSI), if applicable.
4. Provide a public comment period. A public comment period allows for all interested parties to review the analysis presented in the Draft SEA and provide feedback. The Draft SEA will be available to the public for a 30-day review at the Sierra Vista Public Library, 2600 E Tacoma St, Sierra Vista, AZ 85635. The Draft SEA will also be available for download from the CBP internet web page at the following URL address: <http://www.cbp.gov/about/environmental-cultural-stewardship/nepa-documents/docs-review>.
5. Prepare a Final SEA. A Final SEA will be prepared following the public comment period. The Final SEA will incorporate relevant comments and concerns received from all interested parties during the public comment period. The published NOAs, as well as the comments received during the public comment period and CBP's responses to those comments will be provided in Appendix A of the Final SEA.
6. Issue a Finding of No Significant Impact (FONSI). The final step in the NEPA process is the signature of a FONSI, if the environmental analysis supports the conclusion that impacts on the quality of the human and natural environments from implementing the Proposed Action will not be significant. In this case, no EIS would be prepared. The Final SEA and signed FONSI will be distributed to Federal, state, and local agencies or Federally recognized tribes.

1.6 APPLICABLE ENVIRONMENTAL GUIDANCE, STATUTES, AND REGULATIONS

The SEA was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code 4321, et seq.), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500–1508), DHS Directive Number 023-01, Rev.01, and DHS Instruction Manual 023-01-001-01, *Implementation of the National Environmental Policy Act*. Recent changes to the CEQ regulations implementing NEPA became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This SEA substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on December 20, 2019. Therefore, the SEA conforms to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

1.7 AGENCY COORDINATION

In accordance with 40 CFR §1501.7, 1503 and 1506.6, CBP initiated public involvement and agency scoping activities to identify significant issues related to the Proposed Action. CBP is consulting, and will continue to consult, with appropriate Federal, state, and local government agencies, as well as Federally recognized tribes, throughout the SEA process (Appendix A).

Responses received from agencies and recognized tribes are location in Appendix A. Formal and informal coordination is being conducted with the following agencies:

Federal Agencies:

- U.S. Fish and Wildlife Service (USFWS)
- Bureau of Land Management (BLM)
- Coronado National Forest Sierra Vista Ranger District
- U.S. Environmental Protection Agency (USEPA)
- U.S. Army Corps of Engineers (USACE)
- Federal Aviation Administration (FAA)
- U.S. Army
- Fort Huachuca
- National Park Service Coronado National Memorial
- Air National Guard 162nd Fighter Wing Public Affairs
- U. S. Geological Survey

State Agencies:

- Arizona Game and Fish Department (AZGFD)
- Arizona Department of Water Resources (ADWR)
- Arizona State Parks State Historical Preservation Office (SHPO)
- Arizona Department of Transportation (ADOT)
- Arizona Department of Environmental Quality (ADEQ)
- Arizona State Trust Lands Department (ASTL)

Other:

- City of Bisbee
- Cochise County Board of Supervisors
- City of Tombstone
- Town of Huachuca City
- Hereford Natural Resources Conservation
- The Center for Biological Diversity
- Huachuca Audubon Society
- City of Sierra Vista; Sierra Vista Chamber of Commerce
- Sierra Vista Public Library

Native American Tribes:

- Ak Chin Indian Community
- Fort Sill Apache Tribe
- Gila River Indian Community
- Hopi Tribe
- Pascua Yaqui Tribe of Arizona

- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Mescalero Apache Tribe
- White Mountain Apache Tribe
- Tohono O'odham Nation

1.8 PUBLIC INVOLVEMENT

In keeping with established policy regarding an open decision-making process, this SEA and resulting decision document of either a FONSI or a Notice of Intent (NOI) to prepare an EIS were made available to agencies and the general public for review and comment. The Draft SEA was released for a 30-day public review period on July 14, 2021. A Notice of Availability (NOA) for the Draft SEA was published in the Herald Review newspaper and copies of the Draft SEA were made available to the general public at local libraries and on the CBP website at <https://www.cbp.gov/about/environmental-management-sustainability/documents/docs-review> (Appendix A). Comments received during the public review period and responses to those comments re located in Appendix A.

For further information on the Proposed Action or to request a copy of the SEA, please contact: Mr. John Petrilla, Acting Environmental Branch Chief, CBP Border Patrol & Air and Marine Program Management Office, 24000 Avila Road, Suite 5020, Laguna Niguel, CA 92677 or by e-mail at BPAMNEPA@cbp.dhs.gov.

2.0 PROPOSED ACTION AND ALTERNATIVES

Two alternatives are carried forward for evaluation in the SEA: 1) The No Action Alternative; and 2) The Proposed Action. The Proposed Action includes the construction and operation of a joint permanent air facility at LAAF, Fort Huachuca, in Sierra Vista, Cochise County, Arizona.

2.1 PROPOSED ACTION

The Proposed Action would provide improvements and repairs to the current temporary facility located at the southeastern end of LAAF and would include design and construction of the new permanent facility that will eventually replace the existing temporary facility. The Proposed Action also includes demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The Federal Aviation Administration (FAA) would unconditionally approve an Airport Layout Plan showing the proposed new facility and the location of updates to the temporary facilities.

Currently, CBP AMO resources at the temporary facility at LAAF include 47 CBP Agents and contractors who operate two AS-350 A-Star helicopters, one C-206, fixed-wing aircraft, and two MQ-9 Predator B UASs (Figure 2-1). The current temporary facilities are located on approximately 9 acres just south of the Southeast Taxiway at LAAF and include two hangars, two administration buildings, gravel parking (40 spaces), and paved aircraft parking and launch pad (Figure 2-2). It is anticipated that 53 additional personnel and three additional aircraft (one MQ-9 Predator B UAS [three total], one AS-350 A-Star helicopter [three total], and one C-206 fixed-wing aircraft [two total]) would need to be assigned to LAAF to meet CBP AMO's mission requirements, so additional facilities are proposed for design and construction immediately south and adjacent to the current temporary facilities at LAAF.

Figure 2-1. Aviation Assets



Airbus AS-350 A-Star



MQ-9 Predator B

Source: CBP 2015

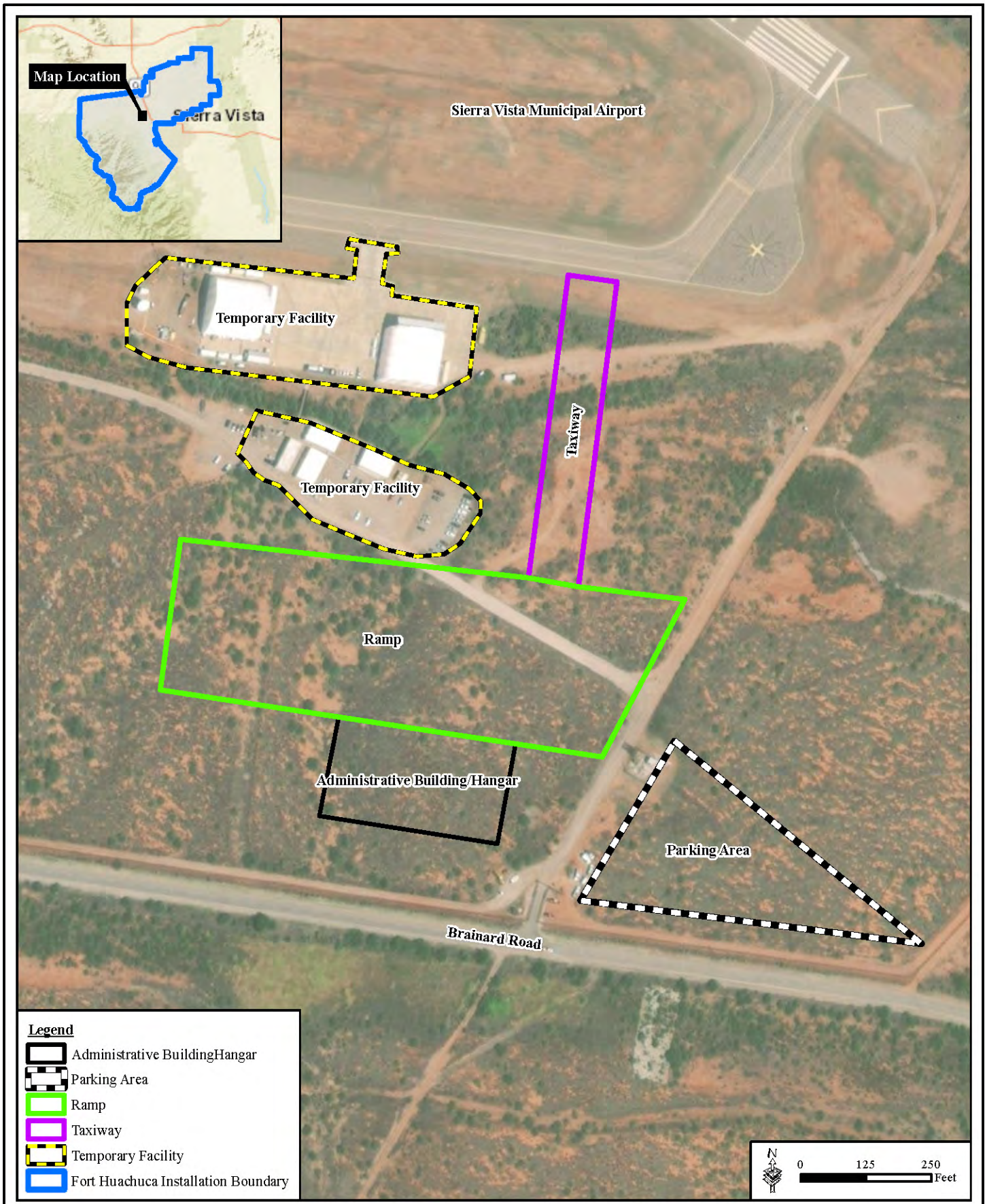


Figure 2-2. Proposed Action Site Configuration Map

Due to the deteriorating condition of the existing temporary site, this project will complete repairs and improvements to the temporary site to keep the facilities operating for the expected duration of the replacement facility construction. The new permanent facility would provide sufficient land with access to a taxiway that will allow for development of a facility to support current helicopter and UAS operations (see Figure 2-2). The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidelines. The facility would have the capacity to accommodate eight aircraft (three MQ-9 Predator B UASs, three AS-350 A-Star helicopters, and two C-206 aircraft) and 100 personnel (47 existing personnel and 53 additional personnel).

2.1.1 Work to be completed at the Current Temporary LAAF

- Renovate East Hangar (10,800 Square Feet [SF] and 30-38 foot tall)
- Renovate West Hangar (10,800 SF and 30-38 foot tall)
- Renovate Air Unit administration building (2,160 SF)
- Renovate East administration building (2,160 SF and 20-30 foot tall)
- Renovate West administration building (2,160 SF and 20-30 foot tall)
- Renovate warehouse (800 SF)

2.1.2 Work to be conducted at the New Joint Permanent LAAF

- Construct administration building (10,000 SF and 20-30 foot tall)
- Construct parking area with 100 vehicle spaces (122,143 SF and 9-12 foot tall)
- Construct hangar (30-38 foot tall) and shop space (26,934 SF)
- Construct new taxiway to connect to airfield (50,000 SF)
- Install aircraft ramp with helipad (130,000 SF)
- Install maintenance and vehicle wash rack
- Install enhanced lighting (25-30 foot tall)
- Install signage and security fencing

2.1.3 Temporary Facilities to be Demolished Following Construction (Subject to the Availability of Funding)

- East Hangar (10,800 Square Feet [SF] and 30-38 foot tall)
- West Hangar (10,800 SF and 30-38 foot tall)
- Air Unit administration building (2,160 SF)
- East administration building (2,160 SF and 20-30 foot tall)
- West administration building (2,160 SF and 20-30 foot tall)
- Warehouse (800 SF)

2.2 NO ACTION ALTERNATIVE

The No Action Alternative would preclude the construction and operation of a joint permanent air facility at LAAF, Fort Huachuca, in Sierra Vista, Cochise County, Arizona, and the FAA would not have an Airport Layout Plan update to review. The No Action Alternative does not meet the purpose and need for the proposed project, but will be carried forward for analysis, as required by CEQ regulations. The No Action Alternative describes the existing conditions in the absence of the Proposed Action.

2.3 ALTERNATIVES EVALUATED BUT ELIMINATED FROM FURTHER CONSIDERATION

CBP has previously completed a draft SEA and final EA to evaluate various potential parcels near LAAF for construction of a permanent facility. CBP completed a draft SEA in 2010 (CBP 2010a); however, prior to completion, the Army requested CBP consider a different location. Accordingly, CBP evaluated a different parcel that was also located on the airfield, and in 2015 an EA (CBP 2015) was completed for that location. Most recently, however, the Army and CBP have a desire to construct the facility at the parcel originally considered as the Proposed Action in the 2010 draft SEA. As such, no additional alternatives were evaluated and eliminated from further consideration.

In the 2015 EA, alternatives outside of the Sierra Vista Subwatershed were not considered for further evaluation because of the unique airspace requirements of UAS operations. Further, CBP discussed placement of two alternative locations in an effort to identify the best site location for the joint permanent air facility. These two potential alternatives, located next to one another at the southeast end of LAAF, had been previously determined as potential locations for the permanent facility. However, these alternative locations were deemed ineligible due to conflicts with the Fort Huachuca RPMP.

2.4 ALTERNATIVES SUMMARY

The two alternatives selected for further analyses are the Proposed Action Alternative and the No Action Alternative. The Proposed Action fully meets the purpose of and need for the project, and the preferred construction and operation of a joint permanent air facility at LAAF, Fort Huachuca, Arizona. An evaluation of how the Proposed Action meets the project’s purpose and need is provided in Table 2-1.

Table 2-1. Alternatives Matrix of Purpose of and Need for Alternatives

Purpose and Need	Proposed Action	No Action Alternative
Provide a new joint permanent air operations facility	Yes	No
Provide additional space and facilities for expansion to 100 personnel	Yes	No
Provide adequate space and facilities (e.g., aircraft parking ramp and taxiway needed to connect new location to airfield; hangar and shop space support for three MQ-9 Predator B UAS, three AS-350 A-Star helicopters, two C-206 fixed-wing aircraft; maintenance building; and a 100-personnel parking area) at LAAF	Yes	No
Provide facility improvements to the current temporary LAAF	Yes	No

3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

3.1 PRELIMINARY IMPACT SCOPING

This section describes the natural and human environments that exist within the region of influence (ROI) and the potential impacts of the No Action Alternative and Proposed Action Alternative outlined in Section 2.0 of this document. The ROI for the air facility upgrade is LAAF and Fort Huachuca in Cochise County, Arizona. Only those issues that have the potential to be affected by any of the alternatives are described, per CEQ guidance (40 CFR § 1501.7 [3]).

Some topics are limited in scope due to the lack of direct effect from the Proposed Action on the resource or because that particular resource is not located within the project corridor (Table 3-1).

Table 3-1. Resources Analyzed in the Environmental Impact Analysis Process

Resource	Potential to Be Affected by Implementation of Proposed Action Alternative	Analyzed in This EA	Rationale for Elimination	Impact Intensity
Land Use	Yes	Yes	Not Applicable	Negligible
Geology and Soils*	Yes	Yes	Not Applicable	Minor
Farmlands	No	No	No Prime Farmlands are located with the ROI	No Impact
Hydrology and Groundwater	Yes	Yes	Not Applicable	Negligible Impact due to Mitigation
Surface Waters and Waters of the U.S.	Yes	Yes	Not Applicable	Negligible Impact due to Mitigation
Floodplains	Yes	Yes	Not Applicable	Minor
Vegetative Habitat	Yes	Yes	Not Applicable	Minor
Wildlife and Aquatic Resources	Yes	Yes	Not Applicable	Minor
Threatened and Endangered Species	Yes	Yes	Not Applicable	Negligible Impact due to Mitigation
Cultural, Historical, Architectural, and Archaeological Resources	Yes	Yes	Not Applicable	Negligible
Air Quality	Yes	Yes	Not Applicable	Negligible
Climate	Yes	Yes	Not Applicable	Negligible
Noise and Noise-Compatible Land Use	Yes	Yes	Not Applicable	Negligible

Resource	Potential to Be Affected by Implementation of Proposed Action Alternative	Analyzed in This EA	Rationale for Elimination	Impact Intensity
Light Emissions	No	No	The project area is adjacent to existing temporary CBP facilities and an active airport that act as light emissions sources.	No Impact
Wild and Scenic River	No	No	There are no Wild and Scenic rivers in the ROI.	No Impact
Utilities and Infrastructure**	Yes	Yes	Not Applicable	Minor
Aesthetics and Visual Resources	No	No	The Proposed Action is located adjacent to the existing airfield and facilities and would not be out of place visually.	No Impact
Roadways and Traffic***	Yes	Yes	Not Applicable	Negligible
Department of Transportation Act, Section 4f	No	No	No Section 4f properties are located in the ROI	No Impact
Hazardous Material, Solid Waste and Pollution Prevention	Yes	Yes	Not Applicable	Negligible
Socioeconomics	Yes	Yes	Not Applicable	Negligible
Coastal Resources	No	No	No Coastal Resources are located in the ROI	No Impact
Environmental Justice and Protection of Children	No	No	The Proposed Action would occur in an area of existing military airfield related land use. There are no housing areas or residential populations within the immediate vicinity of LAAF.	No Impact
Sustainability and Greening**	Yes	Yes	The construction under this alternative would be consistent with sustainability and greening goals and is not anticipated to result in adverse impacts.	No Impact
Human Health and Safety	Yes	Yes	Not Applicable	Negligible

*Geology and Soil resources are not required for consideration in the NEPA process by the FAA (FAA Order 1050.1F).

**Utilities and Infrastructure and Sustainability and Greening categories correspond to FAA's resource category Natural Resources and Energy Supply.

***Roadways and Traffic corresponds to the Socioeconomics portion of FAA's resource category Socioeconomics, Environmental Justice and Children's Health and Safety Risks.

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action

and occur at the same time and place (40 CFR § 1508.8[a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8[b]). As discussed in this section, the alternatives may create temporary (lasting the duration of the project), short-term (up to 3 years), long-term (3 to 10 years following construction), or permanent effects.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- **Negligible:** A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- **Minor:** Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- **Moderate:** Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- **Major:** Effects on a resource would be obvious and long-term, and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

3.2 LAND USE

3.2.1 Affected Environment

This section addresses current land use conditions, plans, and policies affecting the proposed location for CBP AMO's permanent facility. The ROI for land use encompasses the area proposed for construction and the adjacent land.

Land use planning at LAAF is contingent on the U.S. Army because the airfield is situated on the Fort Huachuca Military Installation. Lands surrounding Fort Huachuca are subject to Cochise County, Santa Cruz County, and City of Sierra Vista land use restrictions. Additionally, Fort Huachuca is adjacent to the San Pedro Riparian National Conservation Area (SPRNCA), which is managed by the Bureau of Land Management (BLM) to protect and enhance the desert riparian ecosystem. The SPRNCA, established by an Act of Congress in 1988, is the dominant geographic feature in the San Pedro Basin, and is managed for a variety of wildlife, environmental, and recreational uses. LAAF and the proposed project are located over 8 miles west of the SPRNCA.

LAAF is one of 21 joint-use airports in the country where military runways also are used by a public airport. Airfield land uses include 1,897 acres of military use at LAAF and 72 acres of

public use at SVMA. According to the Fort Huachuca Real Property Master Plan Update, LAAF has a current and future land use designation as airfield (U.S. Army 2007a per CBP 2015).

Airside facilities at LAAF include runways, taxiways, connecting taxiways, airfield lighting, and navigation and visual aids. These facilities are designed, built, and referenced in accordance with U.S. Army and FAA requirements. Landside facilities include terminal buildings, aircraft parking aprons, hangars, fuel services, aviation-related businesses, and automobile access and parking (Figure 3-1). Fuel services will include secondary containment structures to prevent soil contamination in the event of a fuel spill.

Accident Potential Zones (APZs) are an important land use and zoning consideration at LAAF. APZs, which are identified in Figure 3-2, are designated according to the Department of Defense (DoD) as areas immediately beyond the ends of runways and along primary flight paths that are subject to more aircraft accidents than other areas. Development within APZs is subject to DoD guidelines. APZs are categorized as either APZ I or APZ II, with APZ I being closer to the runway and having the higher potential for accidents. Clear Zones work in conjunction with APZs and are designated at the ends of runways. These zones have the highest potential for accidents and are severely restricted from development (U.S. Army 2007a per CBP 2015).

3.2.2 Environmental Consequences

3.2.2.1 *Alternative 1: No Action Alternative*

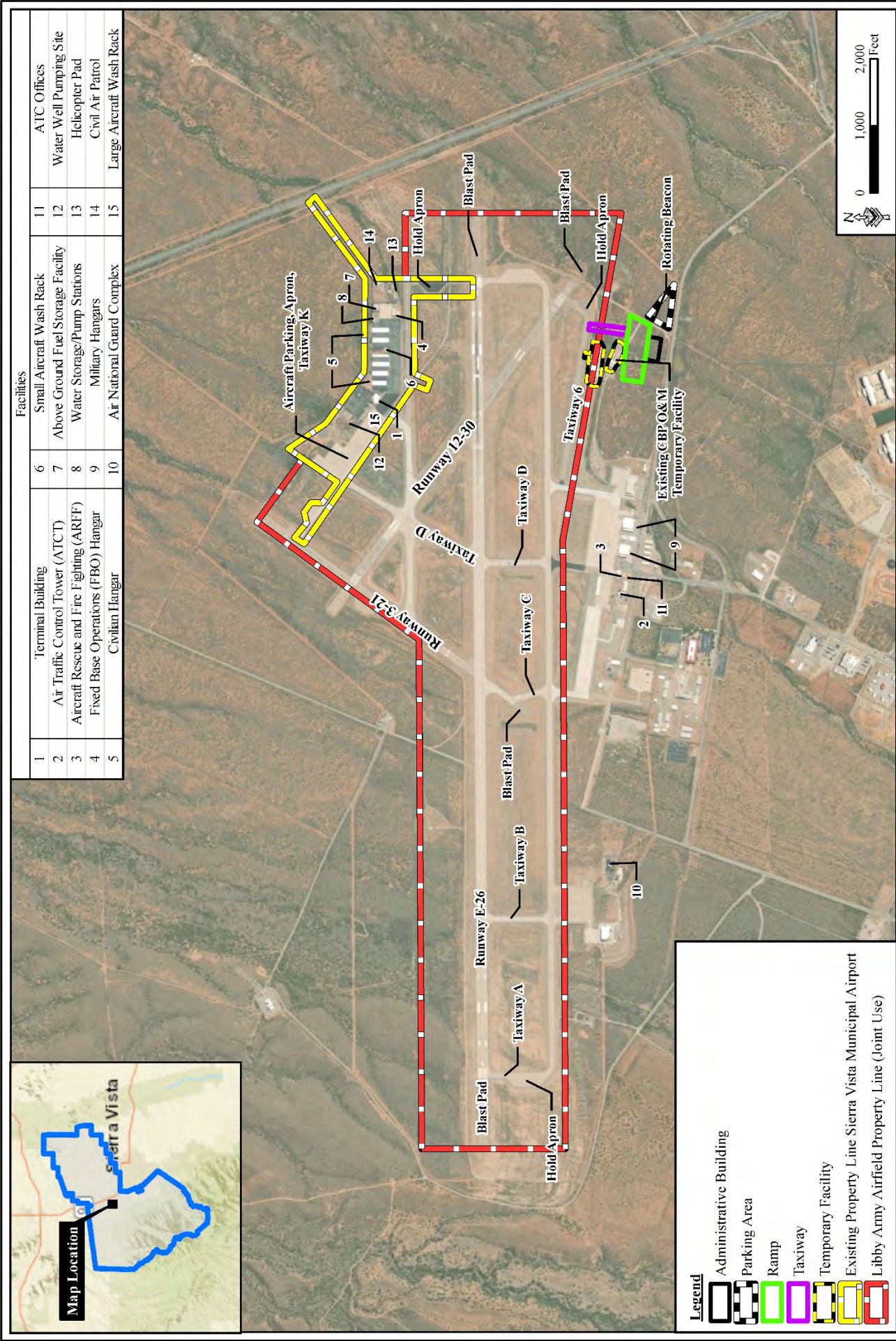
No changes in land use would occur if CBP were to continue utilizing the existing temporary facility. As a result, no temporary or permanent land use impacts are anticipated.

3.2.2.2 *Alternative 2: Proposed Action Alternative*

The Proposed Action is consistent with existing and future land uses identified in the Fort Huachuca Real Property Master Plan Update (U.S. Army 2017). As noted, the site's current land use is categorized as airfield, which means the land must accommodate airfield related facilities including landing and takeoff areas, aircraft maintenance areas, the airfield itself, operations and training facilities, and navigational and traffic aids. The proposed project would permanently impact approximately 13 acres through the construction of the proposed facilities and temporarily impact up to approximately 5 acres. Demolition of the temporary facilities would be consistent with Fort Huachuca and LAAF regulations and guidance. The Proposed Action would have a negligible impact on land use.

There are no known conflicts between the Proposed Action and objectives of Federal, state, regional, or local land use plans, policies, or controls for the site. There also is no known conflict with APZs and Clear Zones on the site and with existing land use conditions. Construction activities would not impact the use of lands nor would they cause a restriction to future land uses adjacent to the site.

In December 2019, Sierra Vista had over 840 listings of homes (Realtor.com 2019). Indirect or induced land use impacts within Sierra Vista or Cochise County are not anticipated, as the local housing market can easily absorb the households associated with the additional personnel. Additionally, the Proposed Action is not anticipated to have a direct or indirect impact on land uses within the SPRNCA.



Facilities

1	Terminal Building	6	Small Aircraft Wash Rack	11	ATC Offices
2	Air Traffic Control Tower (ATCT)	7	Above Ground Fuel Storage Facility	12	Water Well Pumping Site
3	Aircraft Rescue and Fire Fighting (ARFF)	8	Water Storage/Pump Stations	13	Helicopter Pad
4	Fixed Base Operations (FBO) Hangar	9	Military Hangars	14	Civil Air Patrol
5	Civilian Hangar	10	Air National Guard Complex	15	Large Aircraft Wash Rack

Figure 3-1. LAAF/SVMA Airside and Landside Facilities

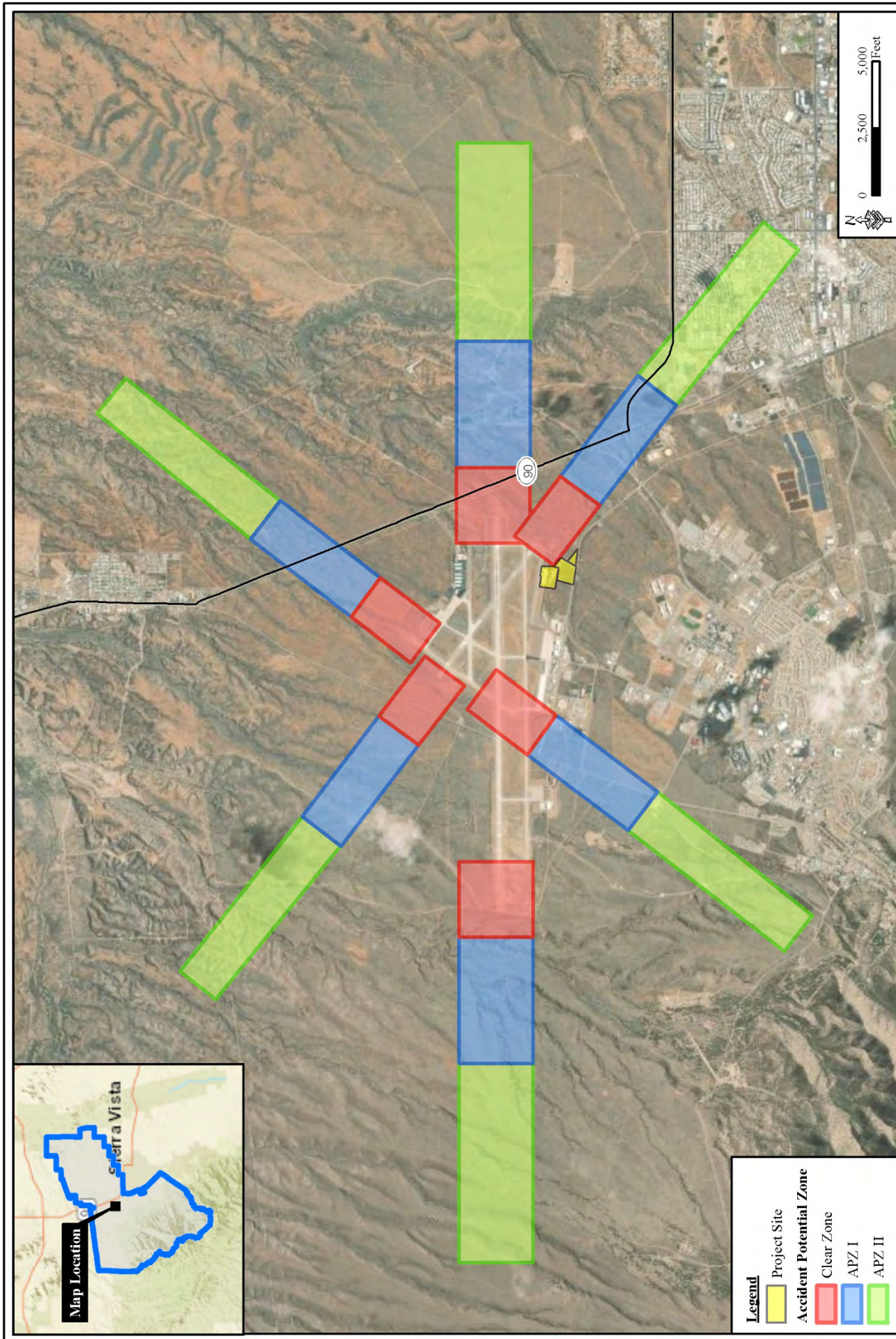


Figure 3-2. Accident Potential Zones

3.3 GEOLOGY AND SOILS

3.3.1 Affected Environment

The proposed project area has been previously graded and disturbed. The project area is flat with a gradual easterly slope and is situated approximately 4,600 feet above mean sea level (amsl), which is the approximate elevation of LAAF.

Several hundred feet of consolidated and unconsolidated sedimentary deposits, most of which are capable of transmitting groundwater, generally underlie the Upper San Pedro Basin. These deposits may be more than 1,000 feet thick in the south, where basin and range type faulting has produced a deep graben structure (CBP 2010a).

Most of the western boundary deposits follow the crest of the Huachuca Mountains, which vary in elevation from about 5,000 to 8,400 feet amsl. This mountain range is composed of intensely folded and faulted terrain in which marine limestone has been thrust beneath a granitic continental margin at the end of the Paleozoic Era, approximately 245 million years ago (CBP 2010a). A series of these thrust faults creates a zone of weakness starting on the westernmost flank of the Mule Mountains, south into Mexico, north up the spine of the Huachuca Mountains, and finally to the northwest to where it dissects the Santa Rita Mountains (CBP 2010a). The principal regional hydrostratigraphic features are the upper and lower units of unconsolidated basin fill and overlying floodplain alluvium. These units form the regional and local aquifers which are further discussed in Section 3.4 Hydrology and Groundwater.

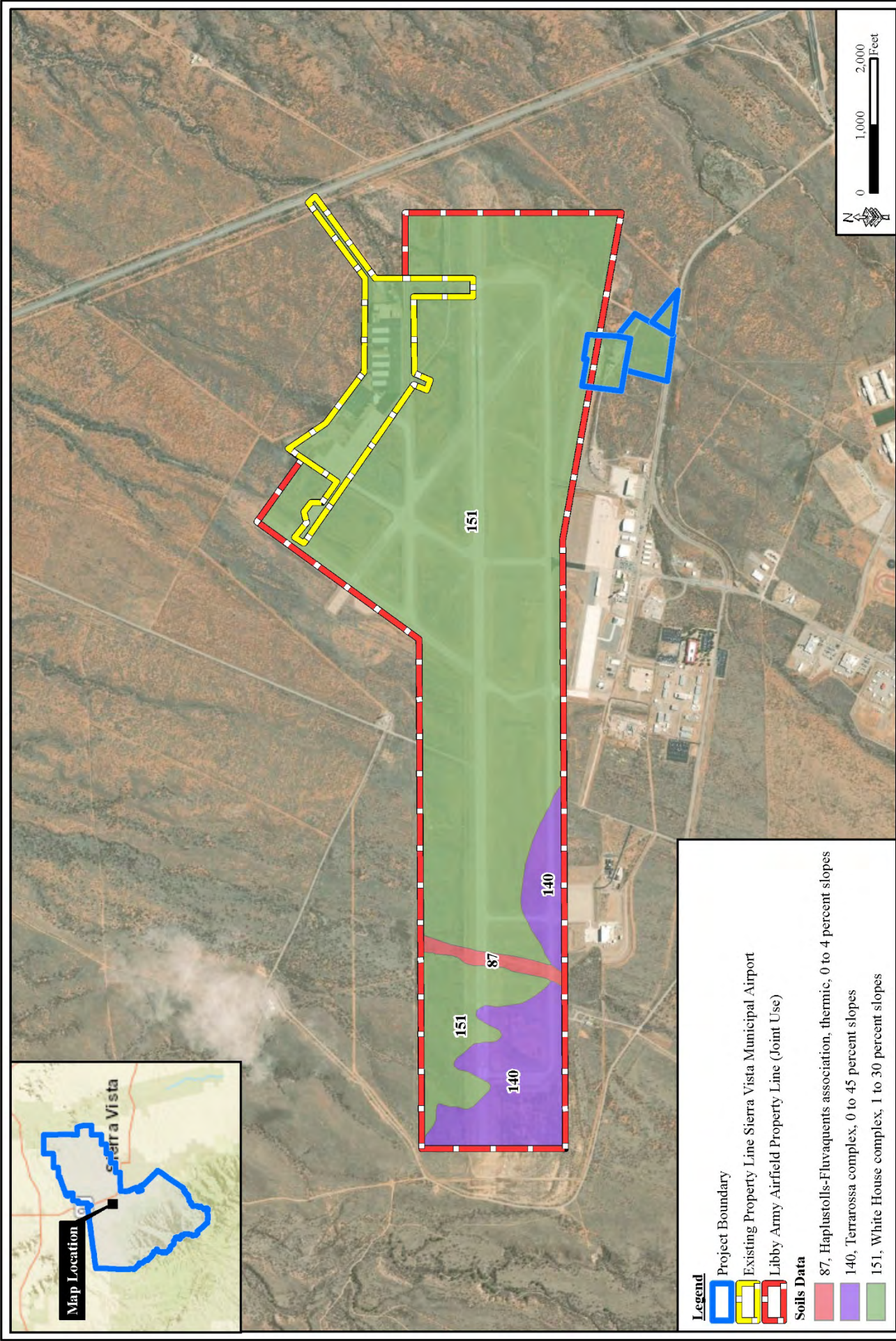
The soil type in this area is classified as the White House complex (Figure 3-3). These gravelly to sandy loams are very deep and well-drained and occur on 1 to 30 percent slopes at 4,500 to 4,800 feet in elevation. They form in mixed fan alluvium on fan terraces where annual rainfall is approximately 12 to 16 inches. These soils are characterized by low to high runoff and slow permeability with water erosion slight to moderate and wind erosion slight. The high clay content of the soils restricts water infiltration and permeability and this soil type responds well to managed, natural and prescribed fires. The high shrink-swell potential should be considered when foundations, concrete structures, and paved areas are designed and constructed (U.S. Army 2007a per CBP 2015).

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It must be kept available for these uses. No prime farmland is located in the ROI; therefore, the Farmland Protection Policy Act does not apply. An impact would be considered significant if the total combined score on Form AD-1005 ranges between 200 and 260. Impact severity increases as the total score approaches 260.

3.3.2 Environmental Consequences

3.3.2.1 *Alternative 1: No Action Alternative*

No change in topographic, geologic, or soil resources of the area would occur. No impact on soil resources is anticipated.



- Legend**
- Project Boundary
 - Existing Property Line Sierra Vista Municipal Airport
 - Libby Army Airfield Property Line (Joint Use)
- Soils Data**
- 87, Haplustolls-Fluvaquents association, thermic, 0 to 4 percent slopes
 - 140, Terrarossa complex, 0 to 45 percent slopes
 - 151, White House complex, 1 to 30 percent slopes

Figure 3-3. Soils Map

3.3.2.2 *Alternative 2: Proposed Action Alternative*

The site is already disturbed from previous airport improvement activities. Grading using standard cut and fill methods will occur in order to prepare the site for construction. Ground disturbance is anticipated to be up to 13 acres and would occur only in previously disturbed areas.

Ground clearing would occur as a result of site development. Surface disturbance from excavation and construction will be limited to the extent practicable and no appreciable loss of soil is anticipated. Soils within the project area are classified with low to moderate erodibility and soil disturbing activities are anticipated only for locations outside of environmentally sensitive and special management zone areas.

Excavated soils will be maintained temporarily at predetermined, nearby stockpile locations and will be reused on-site to balance the site grading. During excavation and stockpiling, soils have potential to be carried by strong winds or washed away by heavy rains, which would constitute an impact. As a result, BMPs such as dust suppression with water and erosion control measures, must be implemented during construction.

An un-named dry wash is located north of the project area. Increased sedimentation caused by grading and impervious surfacing is not anticipated to impede the function of this wash because of BMPs implemented during construction.

Provisions of the Arizona Pollutant Discharge Elimination System (Arizona Administrative Code, Title 8, Chapter 9 and United States Code 1251 et seq.) require construction projects disturbing more than 1 acre to have a Storm Water Pollution Prevention Plan (SWPPP) that includes BMPs. These BMPs are designed to minimize soil erosion and protect surface water quality. By statute, BMPs must include erosion and sediment controls, interim and permanent stabilization practices, velocity dissipation devices in discharge locations and outfall channels, and a description of post-construction storm water management measures. A SWPPP is required prior to project implementation.

Overall, minor permanent impacts to soil resources from grading, excavation, and erosion are anticipated during construction and demolition. Impacts will be minimized by implementing BMPs such as erosion control measures, as part of the SWPPP. No prime farmland is located within the project area or in adjacent areas; therefore, no impacts to prime farmland are anticipated. The Proposed Action would not result in substantial alterations to topography or local or regional geologic conditions since ground disturbance is anticipated to be less than 13 acres total and would occur in previously disturbed areas.

3.4 HYDROLOGY AND GROUNDWATER

3.4.1 Affected Environment

The ROI is defined as the area within which an action may directly or indirectly cause changes in the character of hydrologic and groundwater resources. The proposed project's hydrologic system is within the Sierra Vista Subwatershed (Figure 3-4). The sources of groundwater in the Sierra Vista Subwatershed include mountain-front recharge, streambed infiltration, and groundwater flow moving northward from Mexico. A vast majority of the Sierra Vista Subwatershed is owned by the state (Arizona) and the Federal government (Callegary et al. 2016).

Groundwater is transferred to the San Pedro River in gaining reaches from groundwater flow out of the basin to the north (ADWR 1994 per CBP 2015 and Callegary et al. 2016). This hydrologic system can be quantified as a water budget and is illustrated in Figure 3-5.

Fort Huachuca, the communities of Sierra Vista and Huachuca City, agricultural operators, and mining operators rely entirely on groundwater pumped from the regional watershed. When groundwater is pumped from an aquifer, it is removed from storage or natural discharge (groundwater recharge or discharge). The natural discharge provides stream baseflow or is consumed through riparian evaporation and plant transpiration (evapotranspiration). Over time, groundwater pumping in excess of recharge has created local declines in groundwater elevation. As groundwater elevations decline, the quantity of water flowing into the San Pedro or Babocomari rivers as baseflow is likely to decrease.

As part of a regional effort to obtain a sustainable yield (or balanced water budget), the Secretary of the Interior in cooperation with the Upper San Pedro Partnership (USPP) prepared an annual report to Congress known as the Section 321 Report. This report identified the steps taken to reduce overdraft and restore sustainable yield of groundwater in the Sierra Vista Subwatershed. Progress is being made toward balancing the water budget within the subwatershed with the implementation of a variety of specific management measures including water conservation, reuse, and recharge. The last Section 321 report was the *Water Management of the Regional Aquifer in the Sierra Vista Subwatershed – 2012 Report to Congress* (USDOI 2014). This 2012 Section 321 Report estimated a groundwater storage deficit of 5,100 acre feet per year (AF/YR) in the Sierra Vista Subwatershed in calendar year 2011. This groundwater storage deficit cannot be directly compared to the deficits calculated in pre-2006 Section 321 reports because of the use of an updated estimate of riparian evaporation and plant transpiration. Table 3-2 summarizes the 2011 water budget for the Sierra Vista Subwatershed.

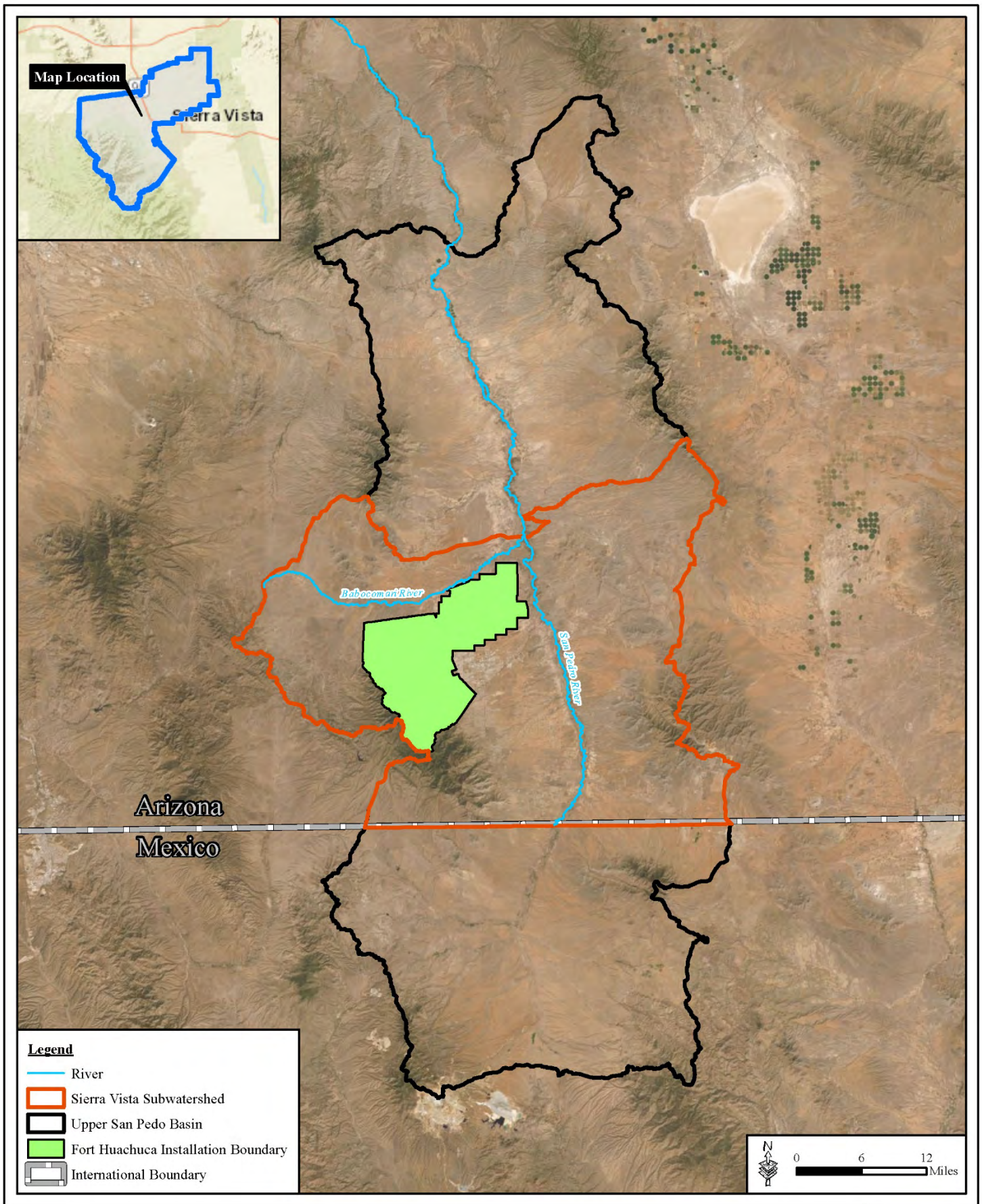
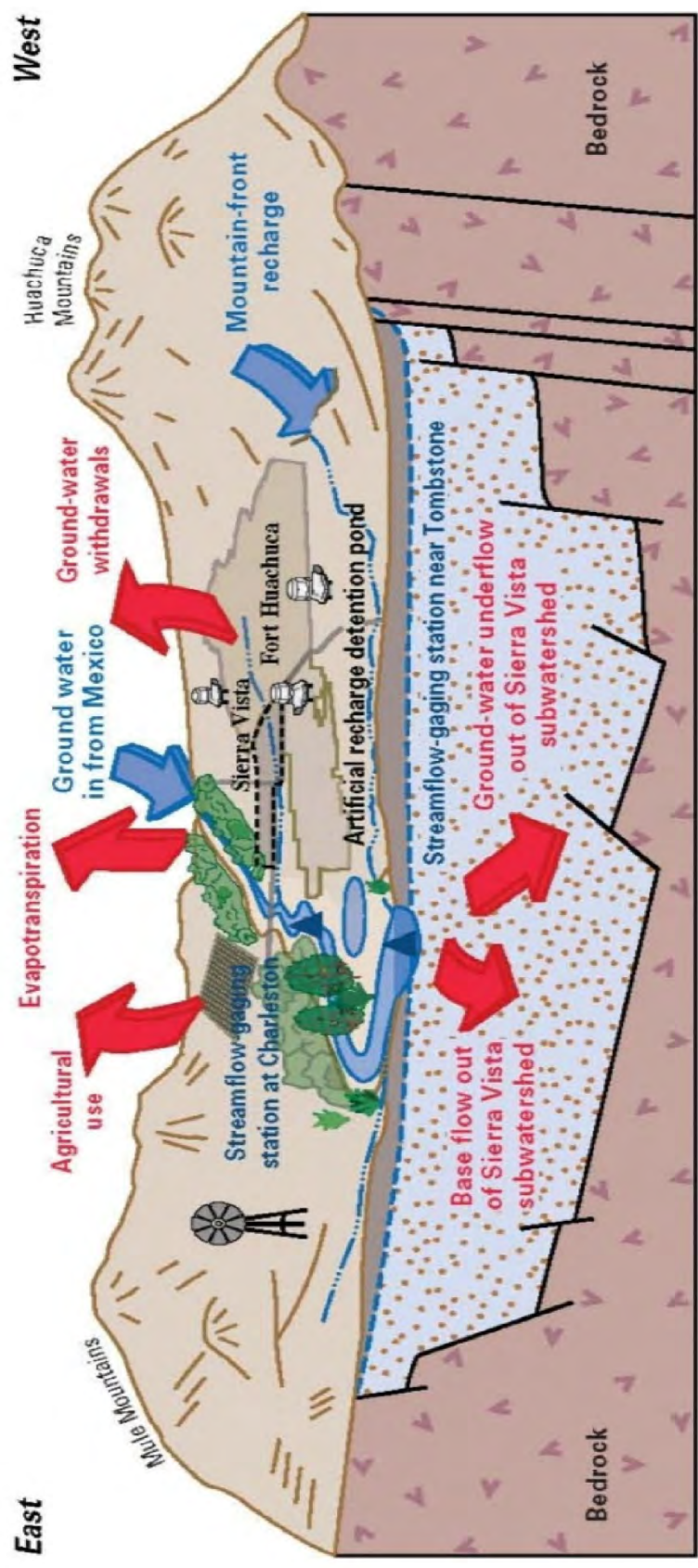


Figure 3-4. Sierra Vista Subwatershed



Source: USGS 2007

Figure 3-5. Simulated Annual Water Budget

Table 3-2. 2011 Water Budget for the Sierra Vista Subwatershed

Component	Estimated Volume AF	Description
Natural Aspects of System		
Natural Recharge ¹	15,000	Inflow largely from percolating waters on and around mountains and through ephemeral channels
Groundwater Inflow ¹	3,000	Subsurface inflow from Mexico
Groundwater Outflow ¹	-440	Subsurface outflow at USGS San Pedro River near Tombstone stream flow-gauging station (09471550)
Stream Baseflow ²	-4,890	Groundwater discharge to the river that flows out of the Subwatershed
Evaporation and Plant Transpiration ³	-10,800	Groundwater consumed in the riparian system exclusive of evapotranspiration supplied by near-riparian recharge from precipitation or flood runoff
Sub-total	1,900	Natural aspects of system
Pumping		
Public Water Supply (gross)	-9,933	Groundwater withdrawals by water companies and municipalities (excluding golf courses)
Rural Wells (gross)	-4,238	Groundwater withdrawals by private wells
Industrial (gross)	-1,226	Groundwater withdrawals for industrial, golf courses, sand and gravel operations
Irrigation (net) ⁴	-61	Groundwater withdrawals for agricultural use; consumptive use only
Sub-total	-15,500	Pumping
Active Management Measures		
Reduction of Riparian Evapotranspiration	645	Management of invasive mesquite
Municipal Effluent Recharge ^{5,6}	3,273	Recharge by the City of Sierra Vista, the Fort, City of Tombstone, and City of Bisbee
Detention Basin Recharge ⁷	143	Recharge of storm water within basins that have been installed to mitigate increased flood peaks in ephemeral-stream channels resulting from urbanization.
Sub-total	4,400	Active management measures
Passive Recharge Resulting from Human Activities		
Incidental Recharge ⁸	2,066	Mainly from exterior irrigation and septic tanks
Urban-Enhanced Recharge ⁹	2,300	Urbanization concentrates runoff in ephemeral-stream channels which increases natural recharge
Sub-total	4,400	Passive recharge due to human activities
Aquifer Storage Change ¹⁰	-5,100	Additions or reductions in stored aquifer water

Source USDOI 2014; ¹ Flow volume estimated by the Arizona Department of Water Resources; ² USGS San Pedro River near the Tombstone streamflow-gaging station base flow discharge estimated from the entire period of record; ³ Evapotranspiration value is averaged from the high and low estimates; ⁴ Pumping for irrigation is consumptive use only. The area considered is the groundwater basin portion of the Sierra Vista Subwatershed only; ⁵ Municipal effluent recharge is water returned to the aquifer through recharge facilities as reported by the City of Sierra Vista; ⁶ Includes 350 acre-ft of incidental recharge through the constructed wetlands above the recharge ponds at the Sierra Vista Waste Water Reclamation facility; ⁷ Recharge of stormwater with basins installed to mitigate flood peaks in urban ephemeral-stream channels; ⁸ Incidental recharge is an estimate of water returned to the aquifer from septic tanks and turf watering; ⁹ Urbanization in semiarid climates can increase recharge by concentrating rainfall runoff in ephemera-stream channels; ¹⁰ Subtotals and total are equal to sum of individual terms rounded to nearest 100 acre-ft; sum of subtotals can differ from sum of all individual terms rounded to nearest 100 acre-ft due to rounding error.

Extensive research and modeling efforts regarding the complex hydrology of the Sierra Vista Subwatershed are on-going. The regional aquifer is deep and mostly unconfined, except in some portions of the southern half of the subwatershed. The regional aquifer is estimated to contain between 19.8 to 26.1 million acre feet (AF) of recoverable water (ADWR 2005). Recently, U.S. Geological Survey (USGS 2019a) published a Scientific Investigations Report which evaluated the groundwater usage in the Sierra Vista Subwatershed within the Upper San Pedro Basin. Estimations predicted an annual 5,100 AF reduction in human water consumption from the Sierra Vista Subwatershed from 2002 to 2012. However, the 2012 groundwater budget still showed an approximately 5,000 AF deficit (USGS 2019a).

Overall, the chemical quality of the groundwater obtained by Fort Huachuca and other users in the Upper San Pedro Basin is good and is considered suitable for domestic uses. However, in several areas (St. David and Benson), fluoride and sulfate concentrations at or above drinking water standards have been noted. Fluoride concentrations are relatively low throughout the subwatershed but have been trending upward from 1993 to 2012, ranging from 0.2 to 0.8 mg/L. Sulfate concentrations have had a precipitous decline with concentrations decreasing by 3 to 4 percent annually from 2003 to 2012 (USGS 2019a). Groundwater at the Fort is treated with chlorine, and no other treatment is required (U.S. Army 2007).

The Sierra Vista subwatershed is an extremely active area with respect to water resource management activities. Concern about regional groundwater withdrawal and potential impacts to the stream flow in the San Pedro River have increased in recent years. Considerable effort has been devoted to assessing the nature and extent of these impacts, as well as to developing and implementing plans to mitigate any adverse impacts. The city of Sierra Vista, Arizona Land and Water Trust, Fort Huachuca, numerous Federal, state, and local agencies, and a large number of citizens and interest groups have been involved in this process (U.S. Army Garrison, Fort Huachuca [USAGFH] 2000). Over the past decade, tremendous progress has been made in reducing groundwater consumption rates in the Sierra Vista Subwatershed. This progress has come in the form of reduced groundwater demand both on- and off-Installation and increased artificial and enhanced recharge of the groundwater system. Annual pumping from Fort Huachuca production wells has decreased from a high of approximately 3,200 AF in 1989 to a low of approximately 986 AF in 2012.

In the case of Fort Huachuca, the reduction in water demand has occurred through a variety of measures including fixture upgrades (i.e., replacement of high water use plumbing fixtures with low water use fixtures), facility infrastructure removal/consolidation (i.e., demolition of facilities), aggressive leak detection and repair, water conservation education, and implementation of a strict landscape watering policy in military family housing. Agricultural pumping has decreased as a result of the retirement of agriculture associated with creation of the SPRNCA and through the purchase of conservation easements by Fort Huachuca in partnership with The Nature Conservancy and Cochise County (Arizona National Guard [AANG], 2008 per CBP 2015).

3.4.2 Environmental Consequences

3.4.2.1 Alternative 1: No Action Alternative

The No Action Alternative would result in the predicted total groundwater use of 16.92 AF/YR related to the direct, domestic, and induced water use generated by the CBP LAAF temporary facilities at present staffing levels of 47 persons (CBP 2010b, Table 18. Note: what CBP 2010b called current was 47 persons; future was estimated for 69 persons) (Appendix B). In 2015, CBP established a conservation easement on 1,912 acres at the Flying H Ranch in Cochise County, Arizona as a water conservation measure to offset effects to regional groundwater and flows in the Babocomari and San Pedro rivers from staffing at CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF (Appendix C). The conservation easement yields a water savings of 210.60 AF/YR. After accounting for other water conservation measures in place and current CBP staffing levels at facilities in the Sierra Vista Subwatershed (to include Fort Huachuca), a credit of 82.12 acre-feet (AF) per year (YR) remained to address future water mitigation needs (Enclosure B). The USFWS concurred with CBP's water use and credit calculations in 2015 (Appendix C). The No Action would have negligible direct and indirect impacts on groundwater in the Sierra Vista Subwatershed.

3.4.2.2 Alternative 2: Proposed Action Alternative

Extrapolating from The Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the San Pedro Watershed, and based on personal communications with John Petrilla at CBP, the addition of 53 people would result in an additional groundwater use of approximately 19.08 AF/YR (0.36AF/YR per person multiplied by 53 people) related to the direct, domestic, and induced water use. (See Appendix B) A one-time construction groundwater use of 6.74 AF would also occur under Alternative 2. The additional annual groundwater use of 19.08 AF/YR under the Proposed Action has been mitigated with the 82.12 AF/YR existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR). Thus, the Proposed Action would have negligible direct and indirect impacts on groundwater in the Sierra Vista Subwatershed.

No impact on groundwater quality is anticipated as a result of the Proposed Action because no release of hazardous substances or pollutants and no injection of substances into groundwater is expected to occur with the Proposed Action.

3.5 SURFACE WATERS AND WATERS OF THE U.S.

3.5.1 Affected Environment

The ROI is defined as the area within which an action may indirectly or directly cause changes in the character of surface water resources and designated waters of the U.S. Surface water discharges originating within the Sierra Vista Subwatershed are tributaries to either the San Pedro or Babocomari Rivers (Figure 3-6).

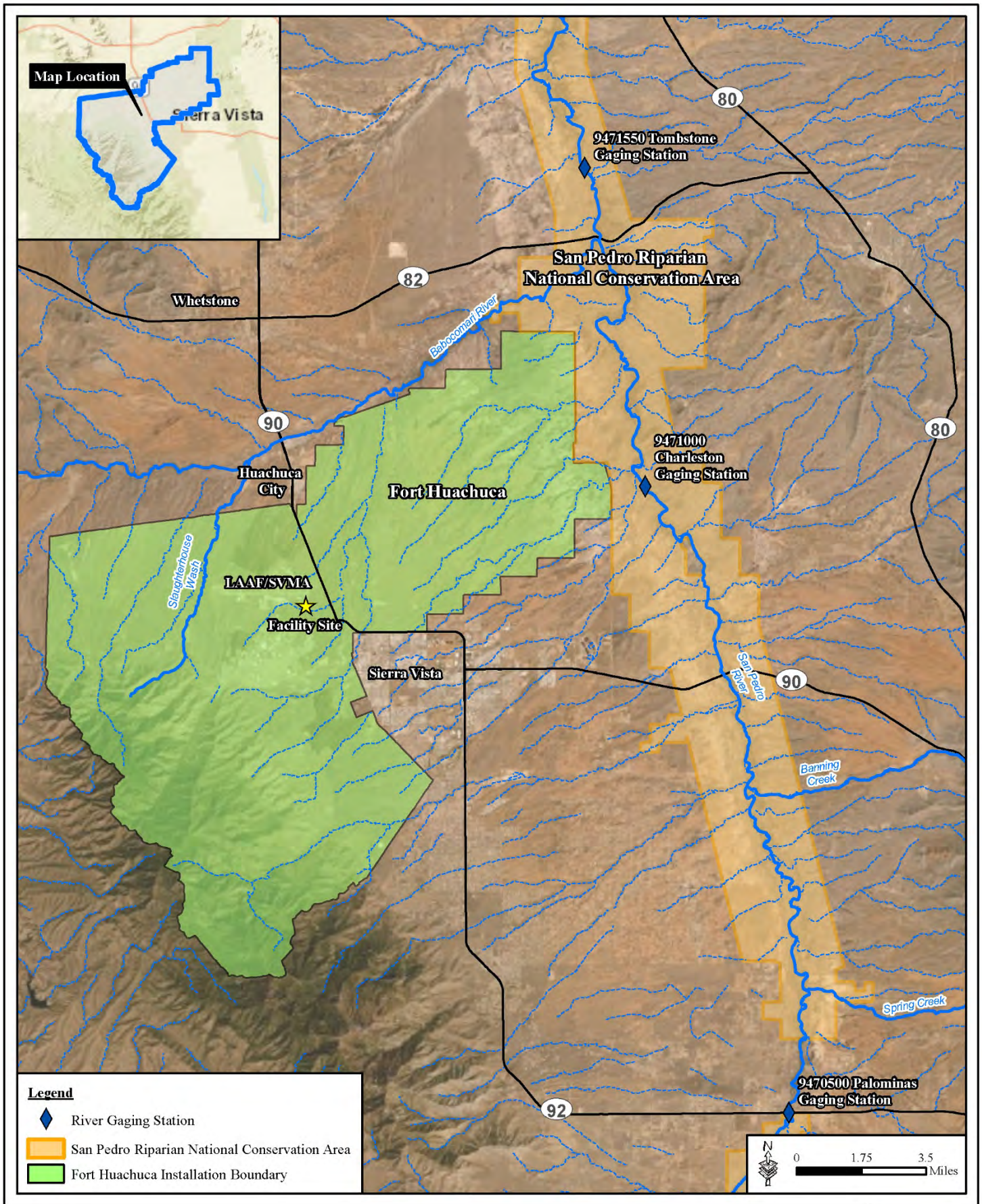


Figure 3-6. Surface Water Resources

An un-named, dry wash is located north of the project area (Photograph 3-1) and is approximately 15 to 20 feet wide, 6 feet deep, and over 1,000 feet long. This wash is not considered a water of the U.S. or surface water per current Federal (Federal Register Vol. 85, No. 77, 22250-22342) and state regulations. No surface waters or waters of the U.S. are located in the project area or on Ft Huachuca.



Photograph 3-1. Un-named Dry Wash in Project Area

FAA’s significance threshold for wetlands is when an action would adversely affect a wetland’s function to protect the quality or quantity of a municipal water supply including sole source aquifers and a potable water aquifer; substantially alter the hydrology needed to sustain the affected wetland’s values and functions or those of a wetland to which it is connected; substantially reduce the affected wetland’s ability to retain floodwaters or storm runoff; adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands; promote development that cause any of the above impacts; or be inconsistent with applicable state wetland strategies. FAA considers the significance threshold for water quality if an action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact. There are no potential jurisdictional wetlands located within the footprint of the Proposed Action.

3.5.2 Environmental Consequences

3.5.2.1 *Alternative 1: No Action Alternative*

The No Action Alternative would result in negligible direct and indirect impacts on surface water within the ROI.

3.5.2.2 Alternative 2: Proposed Action Alternative

It may be necessary to cross (or culvert) the un-named, dry wash to provide a taxiway between the proposed site and the Southeast Taxiway. At its largest, this crossing would be 100 feet long and 20 feet wide resulting in approximately 2,000 sq ft of disturbance. The Proposed Action Alternative would not directly impact wetlands or waters of the U.S. as none are present in the project area.

The Proposed Action would increase the amount of impervious surfaces with the addition of rooftops and paved surfaces for vehicles and aircraft. Surface water runoff from paved surfaces is classified as nonpoint source pollution. The Proposed Action is anticipated to create only a minor increase in additional nonpoint source pollution in the area. No significant impact to water quality on-site or downstream is anticipated.

The addition of 53 people would result in an annual water use of 19.08 AF/YR. Additionally, a one-time construction groundwater use of 6.74 AF would occur under Alternative 2. The additional annual groundwater use of 19.08 AF/YR has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR). Thus, the Proposed Action would have negligible direct and indirect impacts on the baseflow of the San Pedro River.

3.6 FLOODPLAINS

3.6.1 Affected Environment

Floodplains include, at a minimum, areas subject to a one-percent or greater chance of flooding in any given year (i.e., the 100-year flood). Floodplains can be considered lowland and relatively flat areas adjacent to inland and coastal waters or flood-prone areas of offshore islands. Per Executive Summary (E.O.) 11988, Federal agencies are directed to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health and welfare; and restore and preserve the natural and beneficial values served by floodplains. In general topography and drainage patterns direct flows to the northeast into the Babocomari River, which is a tributary to the San Pedro River.

LAAF is situated within the Fort Huachuca boundaries. Because military reservations are not mapped for the National Flood Insurance Program, no Flood Insurance Rate Maps are available from the Federal Emergency Management Agency for Fort Huachuca. Floodplain data for Fort Huachuca originated from the Fort's 1997 RPMP, which has since been incorporated into the Fort Huachuca RPMP Update (U.S. Army 2017). According to these data, a potential floodplain is primarily located on the northwest corner of the project area, where it also coincides with the un-named wash (Figure 3-7). This data does not cite a source, so the degree of accuracy is unknown. Hydraulic/hydrologic studies would be required in order to determine the boundaries of the 100-year and 500-year floodplains. For the purposes of this analysis, the potential floodplain located on the northwest corner of the project area is treated as a 100-year floodplain. FAA's significance threshold for floodplains is when a project would result in notable adverse impacts on natural and beneficial floodplain values.

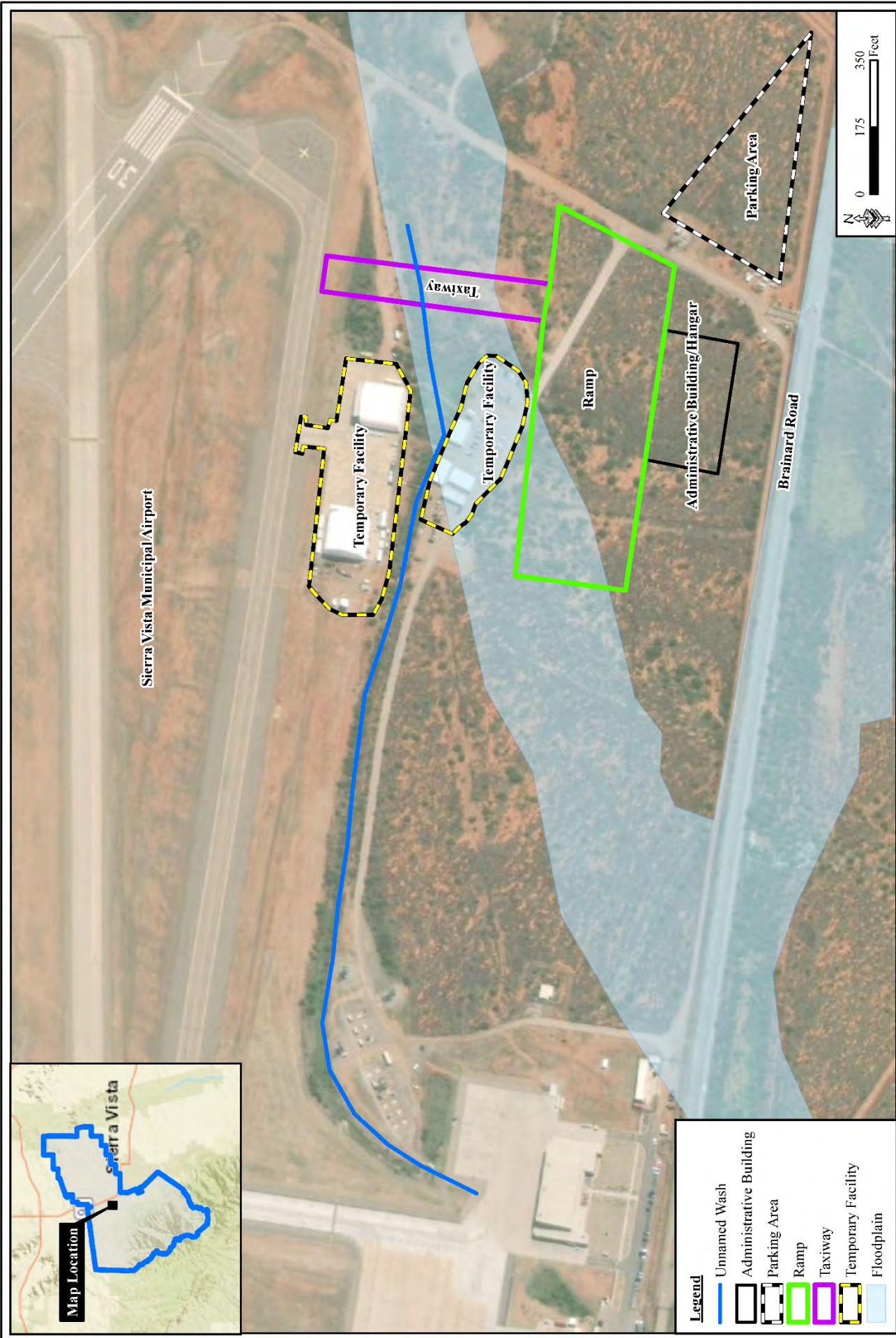


Figure 3-7. Floodplains

3.6.2 Environmental Consequences

3.6.2.1 *Alternative 1: No Action Alternative*

The site design for the existing temporary facility was not able to avoid the floodplain. Consistent with U.S. Army guidelines, the modular trailers were constructed 1-foot higher than the floodplain elevation in order to minimize any damage should a flood occur. Additionally, the existing facilities have been designed to move surface water runoff away from buildings into the un-named wash. As a result, the existing temporary facility is not expected to have an impact on local and regional floodplains and drainage patterns.

3.6.2.2 *Alternative 2: Proposed Action Alternative*

Potential floodplain encroachment would occur with the taxiway and a small portion of the apron, while the administrative building and parking area would be located outside the floodplain. The current alternative site is the only site approved by Fort Huachuca and the limited footprint of the site does not allow all features to be located totally out of the potential floodplain. CBP has minimized impacts to the potential floodplain and structures by siting structures (Administrative Building and Hangar) outside the potential floodplain. The facility would be designed to minimize any restriction to flood flow. It may be necessary to cross (or culvert) the un-named, dry wash to provide a taxiway between the proposed site and the Southeast Taxiway. At its largest, this crossing would be 100 feet long and 20 feet wide resulting in approximately 2,000 sq ft of disturbance. The culvert would be sized during the design phase of the project. As a result, construction of permanent facilities is not expected to have an impact on local and regional floodplains and drainage patterns. No significant impact would occur on floodplains.

3.7 VEGETATIVE HABITAT

3.7.1 Affected Environment

The ROI for vegetative habitat includes areas in and around LAAF where ground disturbance could occur and where activities related to the Proposed Action could cause impacts to vegetation. LAAF and the surrounding area exhibit high desert plain characteristics, where vegetation is typical of open grassland and mesquite-grass savanna habitats as shown in Photograph 3-2.



Photograph 3-2. Typical Vegetation in the Project Area

Biological surveys of the project area were conducted in 2007 and 2019. The sites for the ramp and hangar administration building were surveyed in 2007 as part of the original SEA and the taxiway and parking areas were surveyed in 2019 in support of this SEA. The dominant vegetative species present within the ROI is non-native Lehmann's lovegrass (*Eragrostis lehmanniana*). Other grass species present include purple threeawn (*Aristida purpurea*), tanglehead (*Andropogon contortus*), plains bristlegrass (*Setaria vulpisetia*), dropseed (*Sporobolus* sp.), Arizona cottontop (*Digitaria californica*), Johnsongrass (*Sorghum halepense*), and grama grass (*Bouteloua* ssp.). Tree and shrub species present include velvet mesquite (*Prosopis velutina*), desert broom (*Baccharis sarothroides*), burroweed (*Isocoma tenuisecta*), wolfberry (*Lycium* sp.), fairy duster (*Calliandra eriophylla*), snakeweed (*Gutierrezia sarothrae*), wait-a-minute bush (*Mimosa aculeaticarpa*), hog potato (*Hoffmannseggia glauca*), desert zinnia (*Zinnia acerosa*), and soaptree yucca (*Yucca elata*) (CBP 2019b).

Herbaceous vegetation is relatively abundant and dominated by Russian thistle (*Salsola tragus*), common ragweed (*Ambrosia artemisiifolia*), silverleaf nightshade (*Solanum elaeagnifolium*), telegraph weed (*Heterotheca grandiflora*), and horseweed (*Conyza* sp.). Other herbaceous species included globe mallow (*Sphaeralcea* sp.), trailing four-o'clock (*Allionia incarnata*), spiderling (*Boerhavia intermedia*), ragged nettle spurge (*Jatropha macrorhiza*), spreading fleabane (*Erigeron divergens*), fetid dogweed (*Dyssodia papposa*), brownfoot (*Acourtia wrightii*), pepperweed (*Lepidium virginicum*), and lambsquarters (*Chenopodium album*). The vine species melon loco (*Apodanthera undulata*) was observed throughout the project area in relatively high abundance. Cacti species are present in low numbers and limited to a few scattered prickly pear (*Opuntia engelmannii*), and cholla (*Cylindropuntia imbricata*) (CBP 2019b).

Agaves are an important resource at Fort Huachuca as foraging habitat for the recently Federally delisted lesser long-nosed bat (USFWS 2018). The most significant stands of agave at the Fort are designated as Agave Management Areas, which protect the plants and bats that may be foraging in these areas from training activities and development. The nearest Agave Management Area to the project area is situated approximately 1.8 miles west of the proposed project. In November 2007, a site survey of the original six acres proposed in the 2010 draft SEA identified the presence of four agave plants (Figure 3-8). Two plants were located within the southern portion of the project area and appear to be desert agave (*Agave deserti*). Two sisal agave (*Agave sisalana*) were located just outside of the project area but close to its northern boundary. A recent survey of the proposed ramp and parking area (4 acres) in July 2019 did not result in detection of any agave plants, but the habitat present has not been altered in a way that makes it unsuitable for the plants to be present (CBP 2019b).

Ultimately, the potential effects of unmitigated groundwater use in the Sierra Vista Subwatershed could result in changes in the type and distribution of vegetation along the San Pedro River. Riparian vegetation varies from stream edge to the uplands, depending partly on its water source. Some plants are sustained by the river's baseflow, water in the river during dry periods when no rainfall, runoff, or floods contribute water to the river. Cottonwood and willow are almost entirely dependent on baseflow and are most sensitive to changes in groundwater levels. In general, plants become increasingly reliant on rainfall rather than baseflow as their distance from and above the river channel increases. (USSP 2007a per CBP 2015). Over time, reductions in natural discharge may result in the gradual transition from groundwater dependent vegetation such as cottonwood and willow to more drought-tolerant species.

The FAA significance threshold for vegetation requires consideration of the project's impact on population dynamics, sustainability, reproduction rates, natural and artificial mortality (aircraft strikes), and the minimum population size needed to maintain the affected populations.

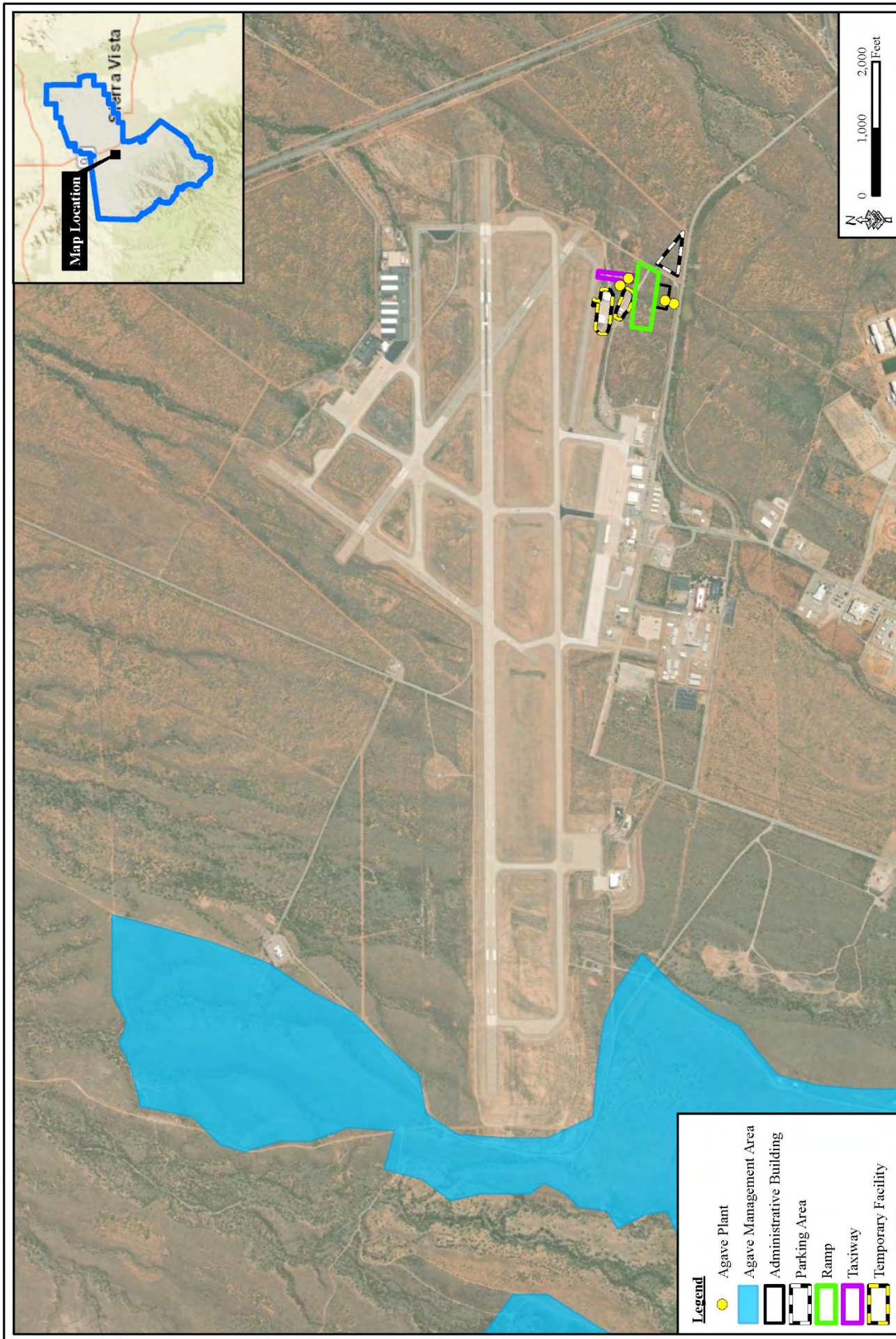


Figure 3-8. Agave located at or near the ROI

3.7.2 Environmental Consequences

3.7.2.1 *Alternative 1: No Action Alternative*

No change in existing vegetative habitat or resources would occur at the project site. No direct impact on vegetative habitat or resources is anticipated. The existing temporary facility was constructed in 2008, disturbing approximately 9 acres of semi-desert grassland and/or mixed-desert scrub habitat.

Indirect impacts associated with groundwater withdrawal from the No Action Alternative would not reduce natural discharge into the San Pedro River and diminish riparian vegetation within the SPRNCA. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF (Appendix C). Under the No Action Alternative, any adverse impacts to the San Pedro River associated with groundwater use at LAAF has already been mitigated for, and the No Action Alternative would not have an adverse indirect impact on riparian vegetation.

3.7.2.2 *Alternative 2: Proposed Action*

The Proposed Action Alternative could disturb up to 13 acres of land by excavation, grading, paving, or landscaping activities. This construction could remove up to approximately 13 acres of semi-desert grassland and/or mixed-desert scrub vegetation consisting primarily of shrubs and grasses within the fenced boundary of LAAF. Alternative 2 could result in the permanent loss of semi-desert grassland and/or mixed-desert scrub habitat. This habitat is abundant across Fort Huachuca and a loss of 13 acres would have a negligible impact.

The Fort's Agave Management Plan dictates that prior to construction in Agave Management Areas, surveys must be conducted to assess potential impacts. Although Alternative 2 is not located within a designated Agave Management Area, care will be taken to limit impacts to agave plants. It is estimated that no more than two agave plants will be affected and CBP will coordinate with the U.S. Army to relocate these plants.

Indirect impacts associated with groundwater withdrawal from the Proposed Alternative would not reduce natural discharge into the San Pedro River and diminish riparian vegetation within the SPRNCA. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF (Appendix C). The Proposed Action would have a one-time water use of 6.74 AF associated with construction, which does not require mitigation. The 19.08 AF/YR of water use associated with the Proposed Action has been mitigated with the 82.12 AF/YR existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR). The Proposed Action would not have an indirect adverse impact on riparian vegetation.

3.8 WILDLIFE AND AQUATIC RESOURCES

3.8.1 Affected Environment

The ROI for wildlife and aquatic resources includes areas in and around LAAF where ground disturbance could occur and where activities related to the Proposed Action could cause impacts to these resources. The term wildlife refers collectively to mammals, birds, fish, amphibians, and reptiles.

Wildlife species found within or adjacent to the proposed project site are typical of open grassland and mesquite-grass savanna habitats. Much of the wildlife is limited to species with a small home range that are not sensitive to disturbance. Wildlife within the ROI is regularly exposed to human disturbance and noise associated with existing airfield activities. Noise impacts are discussed in Section 3.13. Additionally, a fence surrounds LAAF which limits wildlife movement and migration.

Surveys conducted in July 2019 resulted in the observation of desert cottontail (*Sylvilagus audubonii*), pocket mouse (*Chaetodipus sp.*), mourning dove (*Zenaida macroura*), western meadowlark (*Sturnella neglecta*), a variety of small passerines, and lizards. Other species likely to occur in the vicinity of the ROI include, but are not limited to, northern mockingbird (*Mimus polyglottos*), cactus wren (*Campylorhynchus brunneicapillus*), curve-billed thrasher (*Toxostoma curvirostre*), black-tailed jack rabbit (*Lepus californicus*), Harris' antelope squirrel (*Ammospermophilus harrisi*), pocket gophers (*Thomomys spp.*), and various locally common snakes and lizards (CBP 2019b).

The FAA significance threshold for vegetation requires consideration of the project's impact on population dynamics, sustainability, reproduction rates, natural and artificial mortality (aircraft strikes), and the minimum population size needed to maintain the affected populations.

No raptor nests were observed during the field visits for this project. No aquatic resources or habitats exist within the project area.

3.8.2 Environmental Consequences

3.8.2.1 Alternative 1: No Action Alternative

No change in existing wildlife and aquatic habitat and resources would occur in the ROI.

Indirect impacts associated with unmitigated groundwater withdrawal may reduce instream flow and diminish riparian vegetation within the SPRNCA. This change in the hydrologic regime could result in a decrease in aquatic and riparian habitat. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF. All impacts to groundwater have been mitigated, and the No Action Alternative would have negligible direct and indirect impacts on wildlife and aquatic habitats within the SPRNCA.

3.8.2.2 *Alternative 2: Proposed Action*

Other than dispersed agave plants as discussed in Section 3.7, this site does not support any unique wildlife habitat. The site does not support heavy-use wildlife movement areas or wildlife movement corridors because it is fenced. As a result, the Proposed Action Alternative would have a negligible impact on wildlife habitat.

Common wildlife species found at and surrounding the project area could be disturbed or displaced during construction. Construction activities would result in a temporary increase in noise and human activity that may disturb an individual. This impact would be negligible, of short duration, and would not result in a significant impact on wildlife in the ROI. During construction, passerines and other birds protected under the Migratory Bird Treaty Act, would likely avoid the project area for higher quality native habitat. Higher quality native habitat exists in the immediate vicinity; as such, the impact of this habitat displacement is expected to be negligible.

The Proposed Action would have a permanent impact on vegetation and habitat where the proposed facilities (13 acres) are constructed. Approximately 13 acres could be permanently impacted by construction. New facilities would replace habitat that could be in use by native wildlife. Due to the general low quality of the habitat in the project area, impacts would be negligible. Enhanced lighting as well as security fencing associated with new facilities could disrupt normal ecological processes for native wildlife. Implementation of BMPs would minimize impacts on wildlife.

No water resources are found within the project area; therefore, no direct impact on aquatic habitat or resources would occur. During construction, efforts would be taken to ensure no water resources are inadvertently created for aquatic wildlife habitat or as a water source for terrestrial wildlife. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF. The Proposed Action would have a one-time water use of 6.74 AF associated with construction, which does not require long term mitigation credit. The 19.08 AF/YR of water use associated with operations of the Proposed Action has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR). The Proposed Action would have negligible direct and indirect impacts on aquatic and riparian habitats within the SPRNCA.

3.9 THREATENED AND ENDANGERED SPECIES

3.9.1 Affected Environment

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1543) declares the intention of Congress to protect Federally listed threatened and endangered species and designated Critical Habitat of such species. The ESA defines an endangered species as a species in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Proposed species are those that have been formally submitted to Congress for official listing as threatened or endangered. Species may be considered endangered or threatened

when any of the five following criteria occurs: (1) current/imminent destruction, modification, or curtailment of their habitat or range; (2) overuse of the species for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-induced factors affecting continued existence. Additionally, the USFWS has identified species that are candidates for listing as a result of identified threats to their continued existence. The candidate designation includes those species for which the USFWS has sufficient information to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.

The ESA also calls for the conservation of Critical Habitat. Critical Habitat consists of the areas of land, water, and air space that an endangered species needs for survival. It also includes such elements as food and water, breeding sites, cover or shelter, and sufficient habitat area to provide for normal population growth and behavior. Destruction or adverse modification of Critical Habitat is described as an action that results in direct or indirect alteration that appreciably diminishes the value of Critical Habitat for both the survival and recovery of a listed species. The loss of a single piece of habitat may not jeopardize the continued existence of the species, but it may reduce the ability of Critical Habitat to contribute to recovery.

In 2009, discussions were held with USFWS to determine what effect, if any, the originally proposed CBP project might have on the Federally listed species identified for Cochise County, Arizona (CBP 2010a). From these meetings, it was determined that the project, as proposed, had the potential to affect nine species based on the analysis of known species occurrence, the presence of constituent elements of suitable habitat, potential effects of changes in baseflow in the SPRNCA, and/or the listing of Critical Habitat for a Federally listed species. Since that time, a new species (Mexican garter snake [*Thamnophis eques megalops*]) has been added and one species (lesser long-nosed bat [*Leptonycteris curasoae yerbabuena*]) has been removed (Federal Register 2018). This information is considered to be valid for the current Proposed Action site, due to the proposed site within the same location as the original 2010 site. Further, following the delisting of the lesser long nosed bat (*Leptonycteris yerbabuena*), a 15 year post-monitoring plan focusing on continued roost occupancy, as well as monitoring and assessing the bats' forage availability is being drafted at this time. Listed species and Critical Habitat with the potential to be directly or indirectly affected by the Proposed Action are listed in Table 3-3 and are discussed in the following sections.

Table 3-3. Federally Listed Species that Could Potentially be Affected by the Proposed Action, Their Status, and Critical Habitat Designation

Common Name	Scientific Name	Status	Critical Habitat	Observed During Surveys	Suitable Habitat
Mammals					
Ocelot	<i>Leopardus pardalis</i>	Endangered	No	No	No
Jaguar	<i>Panthera onca</i>	Endangered	Yes	No	No
Birds					
Western yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened	Proposed	No	No
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	Experimental Population	No	No	No
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Yes	No	No
Southwestern willow flycatcher	<i>Empidonax traillii</i> spp. <i>extimus</i>	Endangered	Yes	No	No
Reptiles					
Northern Mexican gartersnake	<i>Thamnophis eques megalops</i>	Threatened	Proposed	No	No
Amphibians					
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	Threatened	Yes	No	No
Fish					
Desert pupfish	<i>Cyprinodon macularius</i>	Endangered	Yes	No	No
Gila topminnow	<i>Poeciliopsis occidentalis</i>	Endangered	No	No	No
Flowering Plants					
Huachuca water umbel	<i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i>	Endangered	Yes	No	No

Source: USFWS 2020

FAA considers an impact on Federally listed species to be significant when the USFWS or NMFS determine a proposed action would likely jeopardize a species continued existence or destroy or adversely affect a species critical habitat.

3.9.1.1 Ocelot

The ocelot is Federally listed as endangered. The ocelot is infrequently encountered in Arizona, and only five individuals have been found in the state between 2009 and 2015. Before these sightings, only one ocelot had been reported in Arizona, in 1967 (USFWS 2016a). Within the boundary fence of the installation, there have been several sightings of ocelot since 2013 (CBP 2015). Ocelots prefer dense, concealing vegetation for hunting, and use travel corridors between larger habitat areas. No Critical Habitat has been designated for this species (USFWS 2016a), and no suitable habitat for this species exists in the project area.

3.9.1.2 Jaguar

The jaguar is Federally listed as endangered. There are three records of female jaguars with cubs in Arizona, the most recent occurring in 1910. A female jaguar was reported in Arizona in 1967, but this record has been questioned. Three male jaguars have been observed within southern Arizona since 2015, with the most recent sighting occurring in the mountains surrounding Fort Huachuca in January 2017. Additional reported sightings of the jaguar in the Whetstone, Santa Rita, and Patagonia mountain ranges have all occurred since 2012 (CBP 2015). Considering female jaguars have not been observed in the U.S. in quite some time, it is suspected that any jaguars occurring in Arizona are part of a population from Mexico (USFWS 2018). Jaguar could potentially use the SPRNCA riparian corridor to travel to mountain ranges between Arizona and Mexico.

Jaguars occupy many habitat types including wetlands, swampy savannas, and tropical rainforests. They are typically found near water and are rarely observed in arid environments. There is no suitable habitat for this species in the project area. There is designated Critical Habitat for this species; however, the closest Critical Habitat for jaguar is approximately 5 miles from the project area.

3.9.1.3 Yellow-billed Cuckoo

The western distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*) is listed as threatened (USFWS 2014). Yellow-billed cuckoos need riparian habitat with dense vegetation and developed canopies to breed as well as for foraging. Yellow-billed cuckoos forage for caterpillars in the canopies of trees, and this bird typically reaches its highest densities in riparian habitats containing healthy stands of Fremont cottonwood (*Populus fremontii*). No suitable habitat for this species exists within the project area. While there is proposed Critical Habitat for this species, the closest proposed Critical Habitat is approximately 9 miles from the project area (USFWS 2014).

3.9.1.4 Northern Aplomado Falcon

Experimental releases of Northern aplomado falcons have occurred in Arizona. Their current distribution is from the northern tip of South America up to Texas and into the Trans-Pecos regions. Adult aplomado falcons are strikingly contrasted with black and white facial markings, a lead colored back, and rufous undersides. This species prefers xeric grasslands or any other relatively open habitat type. There is currently no Critical Habitat for these experimental populations.

3.9.1.5 Mexican Spotted Owl

The Mexican spotted owl is Federally listed as threatened (USFWS 2020). This species uses forested canyons and mountains for roosting, foraging and nesting. This owl species was first listed in 1993 by the USFWS. Critical Habitat for this species was designated in 2004. The closest Critical Habitat for this owl species is approximately 13 miles south of Fort Huachuca; no Mexican spotted owls were observed during surveys, and no suitable forest habitat exists for this species within the project area (USFWS 2020).

3.9.1.6 *Southwestern Willow Flycatcher*

The southwestern willow flycatcher is Federally listed as endangered. This species breeds in dense riparian vegetation near surface water or saturated soils in the American southwest (Daw 2013). This species was listed in 1995 and a recovery plan was completed in 2002. On January 3, 2013, USFWS issued a final rule designating Critical Habitat for this species (USFWS 2021a). The southwestern willow flycatcher was not observed during surveys and suitable riparian habitat does not occur in the project area (CBP 2019b).

3.9.1.7 *Northern Mexican Gartersnake*

The northern Mexican gartersnake is Federally listed as threatened. This species was historically found in numerous drainages across central and southern Arizona, but are absent from much of their former range in Arizona; the species is now confined to a few populations (USFWS 2013). Northern Mexican gartersnakes are riparian obligates that require dependable populations of ranid frogs for food. Suitable riparian habitat does not exist within the project area. Critical Habitat has been proposed for this species (USFWS 2013, USFWS 2020).

3.9.1.8 *Chiricahua Leopard Frog*

The Chiricahua leopard frog is Federally listed as threatened. Chiricahua leopard frogs are absent from much of their former range in Arizona and are confined to a few populations in central and southeastern Arizona (USFWS 2007b).

Chiricahua leopard frogs are aquatic habitat generalists that depend on permanent water sources for breeding and metamorphosis. Non-native vegetation, as well as American bullfrogs (*Lithobates catesbeianus*), have had negative impacts on this species. No suitable habitat exists for this species within the project area. While there is designated Critical Habitat for this species, the closest Critical Habitat is located approximately 21 miles from the project area (USFWS 2007b).

Currently, the Chiricahua leopard frog does not occur in the Upper San Pedro River Basin of SPRNCA, but their historical distribution included this area and suitable habitat currently exists within the SPRNCA.

3.9.1.9 *Desert Pupfish*

Desert pupfish is Federally listed as endangered. This small fish generally resides in springs, seeps, and slow-moving streams. No suitable habitat for desert pupfish is found within or in proximity to LAAF.

3.9.1.10 *Gila topminnow*

The Gila topminnow is Federally listed as endangered. The species prefers shallow, warm, fairly quiet waters in ponds, cienegas, tanks, pools, springs, small streams, and the margins of larger streams. The historical range of the of this species includes Arizona and New Mexico. This species was listed in 1967 and a revised recovery plan was completed in 1998 (USFWS 2021b). Reintroduced populations of Gila topminnow occur on the SPRNCA, and this species has full protection under the ESA.

3.9.1.11 *Huachuca Water Umbel*

Huachuca water umbel is Federally listed as endangered. This species is a semi-aquatic to fully aquatic herbaceous perennial that is limited in its distribution to desert wetlands. Critical Habitat for the Huachuca water umbel has been designated, including 33.7 miles of the upper San Pedro River as well as in the far south of the Fort Huachuca property, approximately 9 miles from the project area. The upper San Pedro River is the largest, contiguous habitat of the Huachuca water umbel, and any decrease in its baseflow will lead to a decrease in quality of critical habitat. However, plants become less reliant on baseflow and more reliant on rainfall as distance from the river increases (USPP 2020). No suitable habitat for this species is found within the project area.

Critical habitat for the Huachuca water umbel was designated July 12, 1999 (USFWS 65 FR 132) to include 33.7 miles of the upper San Pedro River from approximately 600 feet south of Hereford Bridge to just north of Fairbank. This includes the portion of the river that flows through the SPRNCA. Critical Habitat is also located in the far south of the Fort Huachuca property, approximately 9 miles south of the Proposed Action.

In terms of Critical Habitat, the primary constituent elements identified in the final rule as necessary for the survival and recovery of the Huachuca water umbel include, but are not limited to, the habitat components which provide the following:

1. Sufficient perennial baseflows to provide a permanently or nearly permanently wetted substrate for growth and reproduction of Huachuca water umbel;
2. A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for water umbel expansion;
3. A riparian plant community that is relatively stable over time and in which nonnative species do not exist or are at a density that has little or no adverse effect on resources available for water umbel growth and reproduction; and
4. In streams and rivers, refugial sites in each watershed and in each reach, including but not limited to springs or backwaters of mainstream rivers, which allows each population to survive catastrophic floods and recolonize larger areas.

3.9.2 Environmental Consequences

Potential threats to riparian dependent species within the SPRNCA include indirect impacts associated with the withdrawal of groundwater, which in turn could affect the baseflow in the Sierra Vista Subwatershed. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF. The Proposed Action would have a one-time water use of 6.74 AF associated with construction, which does not require mitigation. The 19.08 AF/YR of water use associated with operations of the Proposed Action has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR).

Cumulative effects include potential effects from population growth, groundwater usage, and climate change within the Sierra Vista Subwatershed. Cumulative effects are discussed in Section 4.0.

3.9.2.1 Alternative 1: No Action Alternative

There would be no direct effects on any Federally listed species under the No Action Alternative. Negligible indirect impacts on aquatic and riparian dependent species within the SPRNCA would occur under the No Action Alternative. However, negligible indirect impacts on aquatic and riparian dependent species within the SPRNCA would occur under the No Action Alternative. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF. Potential indirect impacts on aquatic and riparian dependent species were mitigated in 2015, and the No Action Alternative would have negligible direct and indirect impacts on aquatic and riparian dependent species.

3.9.2.2 Alternative 2: Proposed Action Alternative

The temporary construction and permanent facility operation and maintenance may cause direct impacts through habitat loss, noise impacts, direct mortality, or human disturbance.

None of the 11 Federally listed species were detected during biological surveys within the project area and there is no suitable habitat within or adjacent to the project area for any of the Federally listed endangered, threatened, or candidate species. Therefore, there are no direct impacts associated with the Proposed Action on jaguar, ocelot, Northern Mexican gartersnake, Mexican spotted owl, northern aplomado falcon, southwestern willow flycatcher, yellow-billed cuckoo, Gila topminnow, desert pupfish, Gila topminnow, Chiricahua leopard frog, or Huachuca water umbel. The Proposed Action does not exceed the significance threshold of FAA. Possible adverse effects to aquatic and riparian dependent species within the SPRNCA include indirect impacts associated with the use of groundwater. Although groundwater would be used to support the Proposed Action, the Proposed Action would not have an adverse impact on groundwater or the baseflow of the San Pedro River. In 2015, CBP established 210.60 AF/YR of water savings credits to offset water use at all CBP facilities in the Sierra Vista Subwatershed, including the temporary facilities at LAAF. The additional annual groundwater use of 19.08 AF/YR has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR). The Proposed Action would have negligible direct and indirect impacts on the baseflow of the San Pedro River or Federally listed aquatic and riparian obligate species. CBP has determined the Proposed Action may affect, but is not likely to adversely affect, Federally listed species. CBP requested informal consultation on this determination with USFWS in a letter dated May 4, 2021. USFWS concurred with CBP's determination in a letter dated April 19, 2022 (Appendix A).

3.10 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

3.10.1 Affected Environment

Section 106 of the National Historic Preservation Act (NHPA) of 1966 and its implementing regulations, 36 CFR Part 800, require CBP to identify and assess the effects of its actions on historic properties. Such properties consist of prehistoric and historic sites, structures, artifacts, and any other physical evidence of prehistoric and historic human activities. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the Advisory Council on Historic Preservation.

The San Pedro River Valley shows evidence of long-term prehistoric human activity and occupation, beginning during the Paleo-Indian Period. Cultural resources within and near the installation boundaries encompass sites spanning from the Paleo-Indian Period to the present. For this SEA, the Area of Potential Effects for historic and cultural resources is the geographic area within which a project may directly or indirectly cause changes in the character or use of historic properties, if such historic properties exist.

Camp Huachuca was founded in 1877 in response to increased hostilities by the Apache, which resulted from the Camp Grant Massacre in 1871 (Hastings 1959). The Apache threat continued to increase under Geronimo's leadership, and Camp Huachuca became Fort Huachuca in 1882 (Smith 1981). Since its founding, the use of Fort Huachuca has varied widely. The installation has housed a variety of Infantry and Calvaries, including Buffalo Soldiers between 1892 and 1942 (Altschul and Jones 1990). The installation also served as a bison preserve during the mid-twentieth century (U.S. Army 2007a).

A Class III survey was conducted in 2007 for the originally proposed site. In response to this project and the Fort's history, additional cultural resources investigations were conducted in 2019 to determine potential impacts of the Proposed Action. Historic properties considered were those listed on or eligible for the National Register of Historic Places (NRHP) or the Arizona Register of Historic Places. The investigation consisted of a Class III cultural resources survey and a Class I site file search of the project area and within a 1-mile radius.

The site file search identified seven previous surveys and four previously recorded sites within 1-mile of the project area. One of the previously conducted surveys overlaps with the majority of the project area including the proposed taxiway and was conducted for CBP during an earlier planning phase for a permanent a permanent joint air facility at LAAF, Fort Huachuca (Thyse 2007). That investigation identified no archaeological sites within the construction area of the Proposed Action. None of the previously recorded archaeological sites are located within the construction boundary of the Proposed Action. The nearest previously recorded archaeological site is located approximately 0.5 mile from the project area and consists of a historic military dump that has yet to be evaluated for its eligibility for the NRHP. The second closest archaeological site is 0.7 mile away and consists of a prehistoric lithic scatter and 1940s Euroamerican structure along with associated features. This resource also has not been evaluated for its eligibility for the NRHP. The third resource is also approximately 0.7 mile away and is the historic alignment of State Route 90, which has been determined to be eligible for the NRHP. The final resource is approximately 0.8 mile away and consists of a historic trash dump that has

yet to be evaluated for the NRHP. The Class III cultural resources survey, which focused on the current proposed taxiway and parking area which were not evaluated in the Class III surveys conducted in 2007, also identified no historic or prehistoric sites or artifacts on the sites (Hart 2019).

FAA's significance threshold is when an action adversely affects a protected property and the responsible FAA official determines that the information from the State and or Tribal Historic Preservation Office addressing alternatives to avoid adverse effects and mitigation warrant further study.

3.10.2 Environmental Consequences

3.10.2.1 Alternative 1: No Action Alternative

No impacts to cultural, historical, and archaeological resources would occur if CBP were to continue using the temporary facility.

3.10.2.2 Alternative 2: Proposed Action Alternative

Because of the level of disturbance and previous investigations at the site and in adjacent areas, the Proposed Action Alternative is expected to have no adverse effect on properties listed on or determined eligible for the NRHP. Given the absence of identified properties, the Proposed Action will not disturb or damage cultural resources and/or cultural resource sites.

Correspondence with affected Native American tribes has occurred. Concurrence with this determination has been received from the Arizona State Historic Preservation Office (SHPO) in two letters one dated January 15, 2008 from Jo Anne Medley, Compliance Specialist/ Archaeologist for the original 2007 investigations and one for the survey of the proposed taxiway and parking area dated October 15, 2019 (Appendix A). The Proposed Action would not result in a significant impact on Cultural, Historical, and Archaeological Resources. If previously unidentified human remains or funerary objects are encountered during activity related to project construction, the contractor will stop work immediately at that location and take all reasonable steps to secure the preservation of those resources, per the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.) and A.R.S. §41-865. In this event, the project proponent, grading contractor, or CBP representative will immediately contact CBP's Environmental Officer and the Fort Huachuca Cultural Resources Manager. The Fort Huachuca archaeologist, in coordination with CBP, will make arrangements for the proper treatment of those resources.

3.11 AIR QUALITY

3.11.1 Affected Environment

Local air quality standards fall under the jurisdiction of the U.S. Environmental Protection Agency (USEPA) and are regulated by the National Ambient Air Quality Standards (NAAQS) as directed by the Clean Air Act of 1970 and the Clean Air Act Amendments of 1990.

Criteria air pollutants are defined as those pollutants for which the Federal government has established air quality standards or criteria for outdoor concentrations in order to protect public health. NAAQS have been set for six criteria air pollutants: carbon monoxide (CO); ozone (O₃); particulate matter with an aerodynamic diameter of 10 micrometers or less (PM₁₀) or with an

aerodynamic diameter of 2.5 micrometers or less (PM2.5); nitrogen dioxide (NO₂); sulfur dioxide (SO₂); and lead (Pb) (USEPA 2009).

The Arizona State Implementation Plan (SIP) includes a compilation of goals, strategies, schedules, standards, and enforcement actions that will lead to compliance with or maintenance of NAAQS. A designated geographic area in compliance with NAAQS is considered in attainment, while an area that is non-compliant is considered to be nonattainment. The State of Arizona has adopted both National Primary and Secondary Standards for criteria air pollutants, as shown in Table 3-4. National Primary Standards define the levels of air quality necessary to protect public health and welfare with an adequate margin of safety. The directly emitted criteria air pollutants include CO, nitrogen oxides (NO_x), SO₂, and PM₁₀. O₃ is a secondary air pollutant that results from photochemical reactions involving NO_x and Volatile Organic Compounds (VOC).

Table 3-4. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide (Co)	9 ppm (10mg/m ³)	8-hour ⁽¹⁾	None	None
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾	Same as Primary	Same as Primary
Lead (Pb)	0.15 µg/m ³ ⁽²⁾	Rolling 3-month average	Same as Primary	Same as Primary
	1.5 µg/m ³	Quarterly Average	Same as Primary	Same as Primary
Nitrogen Dioxide (NO ₂)	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	Same as Primary
Particulate Matter (PM ₁₀)	150.0 µg/m ³	24-hour Average ⁽³⁾	Same as Primary	Same as Primary
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁽⁴⁾ (Arithmetic Mean)	Same as Primary	Same as Primary
	35.0 µg/m ³	24-hour ⁽⁵⁾	Same as Primary	Same as Primary
Ozone (O ₃)	0.075 ppm (2008 std)	8-hour ⁽⁶⁾	Same as Primary	Same as Primary
	0.08 ppm (1997 std)	8-hour ⁽⁷⁾	Same as Primary	Same as Primary
	0.12 ppm	1-hour ⁽⁸⁾ (applies only in limited areas)	Same as Primary	Same as Primary
Sulfur Dioxide (SO ₂)	0.03 ppm	Annual (Arithmetic Mean)	Same as Primary	Same as Primary
	0.14 ppm	24-hour ⁽¹⁾	0.5 ppm	3-hour ⁽¹⁾

Source: USEPA 2019

Notes: ⁽¹⁾ Not to be exceeded more than once per year.

⁽²⁾ Final rule signed October 15, 2008.

⁽³⁾ Not to be exceeded more than once per year on average over 3 years.

⁽⁴⁾ To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁽⁵⁾ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

⁽⁶⁾ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

⁽⁷⁾ (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

⁽⁸⁾ (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

The FAA significance threshold for air quality is if a project exceeds one or more of the NAAQS.

3.11.2 Environmental Consequences

3.11.2.1 Alternative 1: No Action Alternative

No change in existing ambient air quality levels would occur and no new pollution sources would be introduced. No impact to air quality is anticipated under the No Action Alternative.

3.11.2.2 Alternative 2: Proposed Action Alternative

An air quality analysis was conducted as part of the draft SEA (CBP 2010a) for the original proposed facility at this site since the original and current proposed facilities could disturb up to 12 acres of land the air quality analysis completed in 2010 is still applicable. The Proposed Action in this SEA would potentially disturb one area more than the original proposed site. Table 3-4 shows the emissions calculations results for all the increased pollutant sources. Fugitive dust would increase during construction and demolition activities, although it would be reduced greatly by on-site dust suppression activities. The quantity of dust emissions from proposed construction operations is estimated using the USEPA Guidance Document (USEPA 2006). It is estimated that the operations could disturb a maximum of 12 acres for a period of 4 months. Based on this level of activity, the contribution of temporary dust emissions is approximately 8.4 tons of Total Suspended Particulates (TSP). Please note that because this value is output as TSP, use of this value for PM10 would be a conservatively high estimate.

An increase in exhaust emissions would also result from equipment operation during construction of the proposed CBP facilities. Additional exhaust emissions from aircraft and employee personal vehicle operations were also included. These emissions were estimated using the USEPA approved NONROAD and Emissions and Dispersion Modeling System models.

NONROAD model results for the construction equipment are based on the NONROAD equipment population files for the entire county. According to the model user's guide, USEPA does not recommend changing the equipment population files because the activity, equipment population, load factor, and average life data are all linked, and incomplete changes can lead to inconsistent results. As a result, the values presented in Table 3-5 would be well above the probable on-site construction fleet equipment emissions.

Table 3-5. Emissions Calculation Results (in tons per year)

Source	THC	CO	NOx	SO ₂	PM10
Construction equipment (light duty cranes, front-end loader, fork lift, caterpillar tractor, grader, bucket lift, dump trucks, cement truck) and aircraft ground support equipment	3.56*	18.77*	27.09*	4.62*	3.45*
Fugitive Dust	-	-	-	-	8.40**
Aircraft/Rotorcraft and Commuting Vehicles	0.11***	2.15***	11.40***	0.50***	0.01***
Totals	3.67	20.92	38.49	5.12	11.86
EPA tons per year de minimis levels****	100	100	100	100	100

Source: Sprenger 2009, NONROAD, AP-42 and EDMS model results, CBP 2010a

*Based on NONROAD full equipment population datafile estimates.

**Conservative TSP results from EPA AP-42.

***Based on EDMS results.

****De minimis levels do not apply because the project is in an area designated as being in attainment for all criteria pollutants.

Overall, in accordance with the General Conformity Rule (40 C.F.R. §§ 51.850-860 and 40 C.F.R. 5s 93.1 50-160), a Federal agency responsible for an action must demonstrate that the air emissions associated with the action are in conformity with the SIP for Federal nonattainment pollutants. Since the area is in attainment for all criteria pollutants, no Federal action is required in this area. The activities associated with the Proposed Action would not result in a violation of the General Conformity Rule, even if the project was in a nonattainment area. The total emissions from these activities are negligible and would not exceed the pollutant-specific *de minimis* threshold values. Impacts on air quality would be less than significant per the FAA significance threshold.

3.12 CLIMATE

3.12.1 Affected Environment

The USPB, where Fort Huachuca is located, has a dry climate with relatively mild winters and warm summers. The warmest month, on average, is July with an average temperature of approximately 79 degree Fahrenheit (°F), and the coolest month on average is January, with an average temperature of approximately 48 °F (Weatherbase 2020). However, climate varies with topography, being hotter and drier in valley bottoms and cooler, moister on mountain peaks. Clear skies or high thin clouds are common and permit intense surface heating during the day and radiant cooling at night. This creates a large diurnal temperature fluctuation which averages approximately 30 °F (CBP 2015).

The average wind speed is 7 miles per hour (mph), and wind gusts of 20 to 30 mph are common during the daytime. The highest average seasonal precipitation occurs in the summer (July to September) in the form of monsoons. Summer precipitation is highly variable in which some areas receive a great deal of rain while nearby areas receive none. Winter and fall precipitation usually falls in the form of steady rains, while spring has the lowest levels of average precipitation (AANG 2008). The average annual precipitation at Fort Huachuca is 14.2 inches (Weatherbase 2020).

Over the past 50 years, the climate in the western United States has warmed on average by 1.4° F (USGS 2006). A warmer climate could mean less winter snowfall, more winter rain, and a faster, earlier snowmelt in Arizona's mountains. Higher temperatures and increased evaporation could lower water levels and stream flows in the summer (USGS 2006).

3.12.2 Environmental Consequences

3.12.2.1 Alternative 1: No Action Alternative

There would be no new pollution sources introduced into the atmosphere under the No Action Alternative and Greenhouse Gas Emissions would be the same as current conditions. There would no impact on climate under this Alternative.

3.12.2.2 Alternative 2: Proposed Action Alternative

The total emissions from construction activities, demolition activities, and additional exhaust emissions from aircraft and employee personal vehicle operations are negligible under the Proposed Action Alternative. Electricity use would be slightly higher than the No Action Alternative for facility operation and additional UAS operation. New construction will meet

sustainability requirements set by the Guiding Principles; therefore, it is expected that any climate impacts would be positive from green building operations.

3.13 NOISE AND NOISE-COMPATIBLE LAND USE

3.13.1 Affected Environment

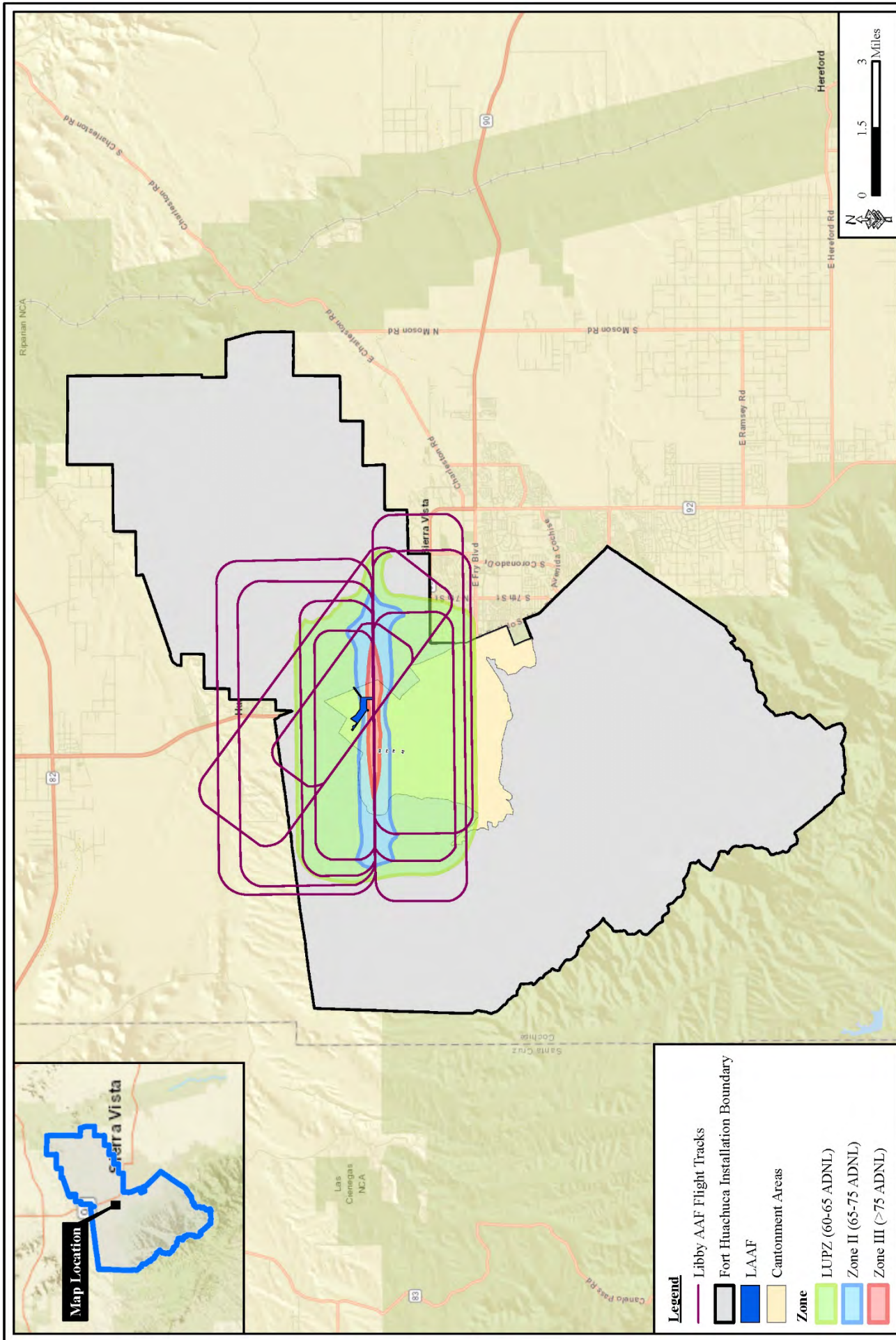
Sound becomes noise when it is perceived as an interference with communication or is otherwise annoying. Sound and noise levels typically are measured in decibels (dB). The degree to which noise will disrupt an area is dependent on the perception of the people living in the affected area. Because the human ear is more sensitive to certain ranges of the sound spectrum, a weighted scale has been developed to more accurately measure human perception of sound. This measurement is called A-weighted decibels (dBA).

If noise levels cause physical damage to hearing or psychological harm, noise is considered a health hazard. For the purposes of measuring annoyance, noise measurements are taken frequently over a period of time (for example, every minute for an hour) and the values are averaged. This value is called an equivalent noise value, which allows the steady source of noise to be compared to established State and Federal noise criteria.

Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor sound levels below 65 dBA (USDOT 1984).

The U. S. Army Public Health Center (APHC) completed an Installation Compatible Use Zone Study (ICUZ) at Fort Huachuca in 2018 (APHC 2018). The noise zone for aircraft flights from LAAF has the greatest impact outside the installation boundary east of the installation in a bordering section of Sierra Vista (APHC 2018). Current CBP AMO operations were modeled as part of the ICUZ study. Study Figure 3-9 illustrates existing noise contours at LAAF (APHC 2018). The study incorporated aircraft type, flight patterns, variations in altitude, power settings, number of operations (in terms of departures and arrivals), and hours of operation. It predicted that 5,141 acres in the vicinity of LAAF are currently exposed to noise levels greater than 65 dBA (AANG 2008). The analysis concluded that since UAS are generally quiet aircraft, the addition of eight MQ-1 UAS as part of the AANG program would only increase the area exposed to noise levels of greater than 65 dBA by 1 acre. Additionally, no changes were identified to sensitive noise receptors at Fort Huachuca and in Sierra Vista.

Individual construction equipment typically generates noise levels of 80 to 90 dBA at a distance of 50 feet and locations more than 1,000 feet from construction sites seldom experience significant levels of construction noise (greater than 65 dBA) (USEPA 1971).



Source: U.S. Army Public Health Center, 2018

Figure 3-9. LAAF Noise Contours

The ROI for noise is limited to the project area and adjacent environments that may be exposed to noise from CBP AMO air operation activities. Aviation noise within the ROI is generated by commercial, general aviation, and military activities. There are no major general aviation airports within the region, and noise generated by either commercial or general aviation traffic is low. The ambient sound environment around LAAF is impacted mainly from aircraft operations and to a lesser degree by automobile traffic (AANG 2008).

FAA's significance threshold for noise is when an action compared to the No Action Alternative for the same timeframe would cause noise sensitive areas located at or above DNL 65 dB to experience a noise increase of at least DNL 1.5 dB. An increase from DNL 63.5 dB to DNL 65 dB is a significant impact.

3.13.2 Environmental Consequences

3.13.2.1 Alternative 1: No Action Alternative

The existing operations associated with the No Action Alternative were evaluated as part of the current noise contours at LAAF (see Figure 3-10). Under this Alternative 5,141 acres in the vicinity of LAAF would be exposed to noise levels of greater than 65 dBA, with a majority of that exposure occurring within Fort Huachuca and LAAF. If CBP were to continue utilizing the temporary facility, there would be no new construction; therefore, noise impacts from construction would not occur.

3.13.2.2 Alternative 2: Proposed Action Alternative

Three aircraft would be added as a result of the proposed action, one MQ-9 Predator B UAS, one AS-350 A-Star helicopter, and one C-206 fixed-wing aircraft. The NOISEMAP analysis for the EA for proposed MQ-9 Predator B UAS at Fort Huachuca by the AANG (2008) concluded that since UAS are generally quiet aircraft, the addition of one MQ-9 UAS as part of the AANG program would only increase the area exposed to noise levels of greater than 65 dBA by 1 acre. It is reasonable to assume that CBP AMO's expansion from two to three MQ-9 Predator B UAS, two to three AS-350 A-Star helicopters, and from one to two C-206 fixed-wing aircraft would have negligible noise impacts to the noise contours. CBP AMO helicopter departure and approach would be located within the proposed 8-acre site and would result in similar noise levels as Alternative 1, since there is no increase in the number of helicopters. Further, the additional aircraft would increase CBP's air operations by 69% but would only increase the total air operations on the installation by 4%.

The Proposed Action would increase aircraft arsenal at Fort Huachuca from five to eight aircraft (three MQ-9 Predator B UASs, three AS-350 A-Star helicopters, and two C-206 fixed-wing aircraft). Currently, each aircraft type conducts two sorties (departure and arrivals) during each 24-hour period for a total of 10 sorties per 24-hour period. Under the Proposed Action the number of sorties conducted in a 24-hour period would increase to three sorties for the MQ-9 Predator B UAS and four sorties each for the AS-350 A-Star helicopter, and C-206 fixed-wing aircraft. A total of 29 sorties could occur in a 24-hour period under the Proposed Action. The Proposed Action would result in an approximately 65 percent increase in CBP sorties. The Proposed Action would have a negligible effect on noise levels in the project area.

Individual construction equipment typically generates noise levels of 80 to 90 dBA at a distance of 50 feet. Locations more than 1,000 feet from construction sites seldom experience significant levels of construction noise (greater than 65 dBA) (USEPA 1971). Heavy equipment used to perform facility construction would cause a temporary increase in noise. While facility construction is estimated to occur over 18 months, heavy equipment would only be required for site preparation (approximately four weeks). Construction activities would be concentrated at the site, where no residences or sensitive noise receptors occur.

Vehicle traffic would increase with construction and operation of the permanent facility. Noise from construction vehicle traffic would occur for approximately 18 months. After construction, vehicle use would increase proportionate to staffing levels (an increase of 31 personnel). Traffic noise generated by vehicles traveling to the site would be similar to levels currently experienced from Brainard Road immediately south of the site. Temporary construction traffic and permanent vehicle traffic would approach the site from the west at the entrance to LAAF at Arizona Street and Brainard Road. No significant noise impacts are anticipated with the Proposed Action Alternative.

3.14 UTILITIES AND INFRASTRUCTURE

3.14.1 Affected Environment

This section describes the available infrastructure, including potable water, wastewater treatment, electric power supply, and natural gas, that may be affected by the Proposed Action and alternatives. LAAF comprises the ROI for these services and resources.

Potable water at Fort Huachuca is pumped from the regional and floodplain aquifers of the Sierra Vista Subwatershed and eight water supply wells provide potable water for Fort Huachuca (U.S. Army 2007a per CBP 2015). As of 1998, the water supply and storage available at Fort Huachuca was adequate to meet current and future demands (U.S. Army 2007a per CBP 2015).

The Fort Huachuca wastewater collection and treatment system is a gravity collection system that includes local sanitary sewers, trunk sewers, and lift stations. The installation's primary wastewater treatment plant was upgraded in 1995 and has a permitted flow rate of 2.0 million gallons per day and currently averages 600,000 gallons per day. The plant has adequate capacity to treat the current and future minimum, average, and maximum day flow rates. At present, this plant plays a major role in managing and conserving water through the Army's multi-tiered water resource management program. Water from the plant is treated and recharged into effluent recharge basins (U.S. Army 2007a per CBP 2015).

Electrical power to LAAF is provided by Tucson Electric Power through a substation located approximately 800 feet west of Greely Hall on Fort Huachuca. The installation is served by six distribution circuits. Each circuit is underground from the substation but transfers at some point to overhead poles. New construction includes underground conduit systems for power distribution (U.S. Army 2007a per CBP 2015).

Southwest Gas provides natural gas to the installation through two Southwest Gas supply main lines that originate from a pipeline along Interstate 10. The east supply connection point is located outside the East Gate, north of Hatfield Street. The west supply connection point is located between Gatewood Avenue and Whitside Road, south of Irwin Street. There are no limits on the system's capacity to meet current and future demand (U.S. Army 2007a per CBP 2015).

FAA's significance threshold for energy supply is when an action's construction, operation, or maintenance would cause demands that would exceed available or future (project year) natural resource or energy supplies.

3.14.2 Environmental Consequences

3.14.2.1 Alternative 1: No Action Alternative

No change in existing public services or utilities would occur. No impact on public services or utilities is anticipated under this Alternative.

3.14.2.2 Alternative 2: Proposed Action Alternative

The operation and maintenance under Alternative 2 would require a minor increase in utility consumption to support the addition of approximately 53 personnel, one MQ-9 Predator B unmanned aircraft, one helicopter, and one fixed-wing aircraft. During construction, the existing sewer and water lines could be extended in a cost effective manner.

The sewer line enters the site from the south at Brainard Road, and the water line enters the site from the north near the temporary facility. In addition, an underground utility vault is situated near the project area. An underground primary electric feed is proposed. This feed would enter the site from the southwest. In all, the site is well equipped with existing infrastructure and utilities, with the exception of fiber optics. If deemed desirable for the permanent facility, a fiber optics line would need to be extended from Fort Huachuca's central plant. As a result, minor impacts to existing public services and utilities would be expected to occur.

3.15 ROADWAYS AND TRAFFIC

3.15.1 Affected Environment

Two modes of transportation are considered in this section: ground and aviation. The ROI for ground transportation includes the roads used to access LAAF while the ROI for aviation includes the surrounding airspace including four restricted areas in the vicinity (R-2303A, R-2303B, R-2303C, and R-2312).

3.15.1.1 Ground Transportation

The airfield can be accessed via State Route 90 and through the roadway network inside Fort Huachuca. Most traffic to LAAF traverses State Route 90 through the East Gate along Hatfield Street, to either Brainard Road or Hunt Street, and then over to Arizona Street where the entrance to LAAF is located. This network consists of primary and secondary collector streets, and local or residential streets.

Primary collector streets, which comprise roadways that carry large volumes of traffic (6,000 to 10,000 vehicles per day), have cross-sections of up to four lanes, a median, shoulders, and sidewalks. Primary collector streets used to access LAAF include Hatfield Street and Brainard Road. Roadways that connect residential or commercial areas to primary collector streets are classified as secondary collector streets. Secondary collector streets carry less traffic (between 2,000 to 8,000 vehicles per day) and are built to lesser design standards than primary collectors. Secondary collector streets have cross-sections of up to four lanes with a median and sidewalks. Arizona Street is classified as a secondary collector. All other roads on post, including Hunt Street, are classified as residential or local streets (Coffman Associates 2001).

No rail service is available on Fort Huachuca. The nearest passenger rail service is located approximately 25 miles north at the Benson Amtrak Station (Coffman Associates 2001).

FAA considers the significance threshold for traffic when an action would cause disruption of local traffic patterns that substantially reduce the Level of Service of roads servicing the airport and its surrounding communities.

3.15.1.2 Aviation Transportation

LAAF is one of 21 joint-use airports in the country where military runways also are used by a public airport. In 1982, 72 acres of land on the north side of LAAF were deeded to Sierra Vista to develop the civilian facilities that comprise SVMA. The airport facilities are under the jurisdiction of the U.S. Army, and their use is governed by covenants and conditions.

Approaches to LAAF occur in Class D Airspace since the facility contains a manned operating control tower. The airport's airspace includes a horizontal radius of 4.3 statute miles of the airport, extending from the surface up to 7,200 feet above mean surface level. Aircraft are not allowed to enter the airspace until the Air Traffic Control (ATC) tower is contacted for clearance to do so. During the time the ATC tower is closed, the airspace reverts to Class G, or uncontrolled airspace. The consolidated radar and tower traffic counts at LAAF in 2013 are summarized in Table 3-6. Currently, an estimated 119,274 air operations are conducted at LAAF annually Federal Aviation Administration ([FAA] 2019).

Table 3-6. Consolidated Traffic Count 2013

Type	2013
Air Carrier	5,013
General Aviation	17,792
Military	96,469
Total	119,274

Source: FAA 2019

Restricted areas encompass airspace identified by a region on the surface of the earth within which the flight of aircraft is subject to restrictions. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft. Entering restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. Four restricted airspace designations exist in the vicinity of Fort Huachuca: R-2303A, R-2303B, R-2303C, and R-2312 (Table 3-7).

Table 3-7. Restricted Airspace at Fort Huachuca, Arizona

Restricted Area	Airspace Area	Active Times
R-2303A (Excludes LAAF)	Surface to 15,000 feet	0600Z Sunday-0600Z Friday: 2300 Sun-2300 Friday (24/5)
R-2303B	8,000 feet to 30,000 feet	0600Z Sunday-0600Z Friday: 2300 Sun-2300 Friday (24/5)
R-2303C	15,000 feet to 30,000 feet	0600Z Sunday-0600Z Friday: 2300 Sun-2300 Friday (24/5)
R-2312	Surface to 15,000 feet	Continuously

Source: USAGFH 2004 per CBP 2015

In addition to restricted airspace limitations, the FAA Advisory Circular 91.36, Visual Flight Rules, Flight Near Noise-Sensitive Areas, requests that pilots maintain a minimum altitude of 2,000 feet above national parks, forest primitive areas, wilderness areas, recreational areas, national seashores, national monuments, national lakeshores, and national wildlife refuge and range areas (USAGFH 2000). The surface of a national park area is determined to be the highest terrain within 2,000 feet laterally of the route of flight or the upper-most rim of a canyon or valley. LAAF is located within 33 nautical miles (NM) of five conservation, wilderness, and national monument areas, including SPRNCA (6 NM east), Miller Peak Wilderness Area (8 NM south), Mt. Wrightson Wilderness Area (22 NM west), Rincon Mountain Wilderness Area (29 NM north), and Saguaro National Monument (33 NM north) (USAGFH 2000).

Current CBP AMO operations at LAAF include five aircraft (one C-206 fixed-wing aircraft, two AS-350 A-Star helicopters, and two MQ-9 Predator B UAS) with as many as 2,600 flight operations (departures and landings) annually (CBP 2021). The FAA estimates current combined flight operations of approximately 119,000 per year at LAAF and SVMA, of which current operations would represent approximately 2 percent of total flight operations.

3.15.2 Environmental Consequences

3.15.2.1 Alternative 1: No Action Alternative

No change in existing traffic or transportation would occur; therefore, no impact on traffic or transportation is anticipated under the No Action Alternative.

3.15.2.2 Alternative 2: Proposed Action Alternative

Due to the remote location of the proposed construction and demolition activities and the lack of any significant traffic flow in and around these sites, construction activities will not result in significant delays or inconveniences to ground traffic. Furthermore, there will be no lane restrictions along Brainard Road and Arizona Street. After construction and demolition, the increase in vehicular traffic from approximately 53 additional personnel would be negligible and would not impede ongoing military or civilian ground operations.

This Proposed Action Alternative would allow for the expansion of CBP AMO air operations. The SVAU assigned to Fort Huachuca currently consist of two AS-350 A-Star helicopters, one C-206 fixed-wing aircraft, and two MQ-9 Predator B UASs. An additional MQ-9 Predator B UAS, one additional AS-350 A-Star helicopter, and one additional C-206 fixed-wing aircraft would be added to the arsenal as a result of the Proposed Action.

Air operations may occur on a 24 hour per day, 5 day per week basis. This could result in approximately 29 air operations (departures and landings) daily resulting in a total 7,540 air operations annually (CBP 2021). The FAA estimates current combined flight operations of 119,274 at LAAF and SVMA, of which proposed operations would represent approximately 6 percent of the total flight operations. This increase in aviation would be negligible as the existing air space is capable of supporting such an increase and air use is consistent with ongoing and planned military and civilian air operations.

Additionally, Alternative 2 is not anticipated to introduce any substantial safety hazard to motorists, pedestrians, or bicyclists (military or civilian), cause a new restriction in existing flight corridors, or cause any significant traffic congestion during construction or operation.

3.16 HAZARDOUS MATERIAL, SOLID WASTE AND POLLUTION PREVENTION

3.16.1 Affected Environment

Hazardous materials are substances that cause physical or health hazards (29 CFR 1910.1200). Materials that are physically hazardous include combustible and flammable substances, compressed gases, and oxidizers. Health hazards are associated with materials that cause acute or chronic reactions, including toxic agents, carcinogens, and irritants. Hazardous materials pose a substantial environmental hazard if they have been released, currently are being released, or could be released into structures, the ground, groundwater, or surface water. Such a release could affect human health and welfare, soil and water systems, and wildlife and vegetative species and habitats. Hazardous material can exist as a solid, liquid, gas, or any combination thereof. They often are associated with storage tanks, maintenance activities, and use of pesticides, fuels, and other petroleum products. For this SEA, the ROI for hazardous materials is confined to areas where CBP operations may occur and where construction activities would take place. A Phase I Environmental Site Assessment for this area was completed January 2008 for the administration building and ramp areas.

Environmental records database searches, interviews, and site visits indicate that no hazardous material concerns, hazardous waste sites, leaking underground storage tank (LUST) sites, or range sites were observed on the project area in 2007. Numerous controlled burn areas performed to limit or reduce plant growth were observed along the wash and in other locations. Although a very limited volume of diesel and/or kerosene fuel may have been released on the ground during controlled burn activities, the fuels were consumed immediately by the fire. Accordingly, this previous action is not considered a significant release that could have an adverse impact on the environment.

Four LUST sites are located down gradient approximately 0.75 miles southwest of the project area and were closed by ADEQ. Only one active underground gasoline storage tank was identified 0.3 miles away at Building 91249 (Control Tower) (Environmental Data Resources, Inc., 2007).

Based on information obtained from the Fort Huachuca Environmental Management Division (EMD), the previously discussed un-named wash was formerly used as a discharge point from a wash rack located west of Hangar 1. Various types of cleaning materials reportedly used at the

wash rack included PD-680 (a high-grade kerosene), Gunk degreaser, paint thinners, paint stripping compounds, and other solvent and degreasers. Prior to 1989, runoff from the wash rack was allowed to discharge directly into the wash located adjacent to the wash rack. LAAF has since constructed an oil/water separation and carbon adsorption/filtration system that discharges to the sanitary sewer. The areas around the wash pad and the wash were investigated in 1992 as part of a Resource Conservation and Recovery Act Facility Investigation and follow-up sampling investigations. According to the Fort Huachuca EMD, the impacted soils within the wash were excavated and thermally treated in 1996 as part of a base-wide remediation project.

The temporary CBP facilities were constructed in 2008. Surveys for asbestos and lead paint have not been conducted at the temporary CBP facilities. However, due to the age of the facilities it is unlikely that asbestos or lead paint is present in the facilities. In the event of future demolition of the temporary facilities, a hazardous material survey would be conducted prior to demolition activities to determine if any hazardous materials are present in the existing structures. If hazardous materials are identified, then appropriate measures would be taken to ensure proper procedures would be implemented during demolition and disposal.

The temporary facility has its own SPCCP (not shared with LAAF or Fort Huachuca), which covers two Jet A fuel tanks on a mobile trailer, a 3,000-gal mobile refueling truck, a 350-gallon diesel generator, and a couple of smaller generators on trailers. No permanent above or below ground storage tanks are on the site other than the generator supply tanks. The mobile truck refuels from the Fort Huachuca petroleum storage site. SPCCP inspections are performed by the contractors who operate the site. Waste petroleum, oil, or lubricants are stored in mobile containers on secondary containment palettes. Hazardous waste, such as oily rags, oil filters, and aerosol cans, are collected in satellite accumulation areas, and then picked up by Fort Huachuca personnel for disposal per an inter-agency agreement. Waste tires are taken off-site to an authorized facility to be recycled.

FAA's significance threshold for hazardous material is when an action involves a property on or eligible for the National Priority List (NPL). Uncontaminated properties within a NPL site boundary do not always trigger this significance threshold.

3.16.1.1 Alternative 1: No Action Alternative

There would not be an increase in hazardous material or hazardous waste associated with CBP operations or construction of the proposed facilities under the No Action Alternative. Standard solvents and cleaning chemicals and petroleum, oil, or lubricants used during routine aircraft maintenance are the only hazardous substances expected to be stored or used at the CBP facility. All hazardous materials would be stored, handled, and disposed in accordance with local, state, and Federal laws and regulations.

3.16.1.2 Alternative 2: Proposed Action

No hazardous materials from historical property usage are located on or directly adjacent to the project area. The Proposed Action is not expected to generate hazardous materials or hazardous waste in quantities or of a type that could not be accommodated by the local waste disposal system. Standard solvents and cleaning chemicals and petroleum, oil, or lubricants used during routine aircraft maintenance are the only hazardous substances expected to be stored or used at

the CBP facility. The Proposed Action is not expected to result in an increased likelihood of an uncontrolled release of hazardous materials that could contaminate soil, surface water, or groundwater. All hazardous materials will be stored, handled, and disposed of in accordance with local, state, and Federal laws and regulations. It is expected that hazardous waste would continue to be disposed of by Fort Huachuca.

The SPCCP at the existing temporary facility describes the response procedure for an accidental spill of hazardous substances or petroleum, oil, and lubricants. The Fort Huachuca Fire Department would respond to a hazardous material release. In turn, the Directorate of Public Work's maintenance contractor is responsible for cleanup once imminent danger to life and health has passed (U.S. Army 2007a per CBP 2015). This SPCCP would be amended to reflect the changes at the proposed permanent facility.

Hazardous waste is not expected to be generated during demolition activities. Temporary structures scheduled for demolition will be surveyed for hazardous materials (asbestos and lead paint) prior to demolition activities. If any hazardous materials are identified in the existing temporary structures, appropriate measures would be taken to assure proper procedures would be implemented during construction and demolition. Demolition activities would not require removing or mitigating for above or below ground storage tanks as none are present at the CBP temporary facilities.

During construction and demolition, soil contamination could occur as a result of petroleum, oil, or lubricant spills. To preclude such impacts, these substances will be stored, handled, and disposed of in accordance with 40 CFR 112 Oil Pollution Prevention, which dictates the development of a SPCCP. The construction and demolition contractors would be responsible for developing and implementing the SPCCP prior to and during construction and demolition. Ultimately, no impacts related to hazardous wastes, materials, or substances are expected to occur as part of the Proposed Action.

3.17 SOCIOECONOMICS

3.17.1 Affected Environment

The ROI affected by the Proposed Action includes Fort Huachuca, the City of Sierra Vista, and Cochise County. Sierra Vista shares a mutual reliance with Fort Huachuca. The installation relies upon Sierra Vista to partially supply housing, community and recreation facilities and retail and commercial services for military and civilian installation personnel. The City utilizes LAAF as its municipal airport and depends heavily on the economic activity generated by Fort Huachuca (U.S. Army 2007a per CBP 2015).

Fort Huachuca's on-base population is counted within the City of Sierra Vista, which is the major population center of the region. The 2019 estimated population for the City of Sierra Vista was 45,641, representing 35 percent of the Cochise County population of 131,280 (Arizona Office of Economic Opportunity 2019a). Fort Huachuca influences the growth of Sierra Vista and the surrounding area. This trend has continued into the 21st Century as demonstrated by Table 3-8.

Table 3-8. Sierra Vista Population Growth 1985-2015

Year	1985	1990	1995	2000	2005	2010	2015
Population	28,792	32,983	37,815	37,775	43,690	45,047	44,183

Sources: U.S. Army 2007 per CBP 2015 and Arizona Office of Economic Opportunity 2019a

The Arizona Department of Commerce projects that by 2030 Sierra Vista’s population will be approximately 45,113 and Cochise County’s population will reach approximately 130,906 (Arizona Office of Economic Opportunity 2019b). The moderate population growth in Sierra Vista results from increasing numbers of military and civilian personnel at Fort Huachuca. Another contributor to the city’s population growth has been an increasing number of retirees as demonstrated by rapid growth of the city’s population over the age of 60 (U.S. Army 2007a per CBP 2015).

The number of individuals employed in Cochise County decreased approximately 4 percent between 2014 and 2017. Table 3-9 provides a breakdown of these figures and indicates the numbers and percentages of individuals serving as military or civilian Federal employees.

Table 3-9. Employment Figures for Cochise County, Arizona

Year	2014	2015	2016	2017
Total Number of Individuals Employed	45,415	43,776	42,925	43,403
Total Government Employees	13,719	13,334	13,099	12,988
Total Armed Forces Employees	4,364	4,424	4,139	3,618

Sources: U.S. Census Bureau 2019

FAA considers the significance threshold for socioeconomics when an action would cause extensive relocation, but sufficient replacement housing is unavailable; extensive relocation of community businesses that would cause severe economic hardship for affected communities; and a substantial loss in community tax base. The FAA significance threshold for environmental justice is when an action would cause disproportionate health and adverse human health or environmental effects on minority and low-income populations. When an action causes disproportionate health and safety risks on children a significant impact may occur.

3.17.2 Environmental Consequences

3.17.2.1 Alternative 1: No Action Alternative

No change in socioeconomics and economic development would occur. No impact on socioeconomics and economic development is anticipated.

3.17.2.2 Alternative 2: Proposed Action Alternative

The Proposed Action Alternative could result in an increase in employment and salaries, facility expenditures, and construction costs compared to the existing conditions in Alternative 1. The Economic Impact Forecast System was selected to estimate the indirect and direct effect of Alternative 2. The direct impact would be a total of approximately 31 full-time equivalent jobs in Cochise County. Additionally, related and induced employment as a result of Alternative 2 could total 168 jobs, representing an increase of 54 new jobs compared to Alternative 1. Total

population and employment attributable to CBP would represent less than 0.3 percent of Cochise County's current employment levels.

Given the small scale of the action relative to the size and complexity of the local economy, no significant socioeconomic impacts are anticipated. No appreciable change in local population distribution, employment, housing demand, or expenditure patterns is anticipated as a result of this action.

The effects of this change in workforce in the area will not be significant in a local or regional context. Construction-related funding for the Proposed Action is not anticipated to be significant in the context of local or regional construction spending. No significant socioeconomic impact to the city of Sierra Vista or surrounding communities is anticipated as a result of the Proposed Action.

3.18 SUSTAINABILITY AND GREENING

3.18.1 Affected Environment

Executive Orders have been in effect for many years directing Federal agencies to incorporate practical methods for sustainability and greening in daily operations. E.O. 13834, Efficient Federal Operations, directs Federal agencies to support their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

It is CBP policy to integrate the principles and practices of sustainability into CBP facilities in order to minimize the effects and total ownership costs of CBP systems, material, facilities, and operations. As such construction of the proposed facility would adhere to the policy set forth in E.O. 13834, Efficient Federal Operations; E.O. 13514, Energy Independence and Security Act of 2007; the Energy Policy Act of 2005; and the 2016 Guiding Principles for Sustainable Federal Buildings and Associated Instructions.

3.18.2 Environmental Consequences

3.18.2.1 Alternative 1: No Action Alternative

The No Action Alternative would not involve any construction and no change in sustainability and greening would occur. Where practical, environmentally sustainable practices would continue to be incorporated in the daily operation and maintenance of the existing facility including solid waste recycling, energy conservation, and water conservation practices.

3.18.2.2 Alternative 2: Proposed Action Alternative

The new construction under the Proposed Action Alternative would have several opportunities to incorporate energy conservation and source reduction as part of the new construction. Where practical, environmentally sustainable practices would be incorporated in the daily operation and maintenance of the existing facility including solid waste recycling, energy conservation, and water conservation practices. The construction under this alternative would be consistent with sustainability and greening goals and is not anticipated to result in adverse impacts.

3.19 HUMAN HEALTH AND SAFETY

3.19.1 Affected Environment

APZs are areas immediately beyond the ends of runways and along primary flight paths that are subject to more aircraft accidents than other areas, as discussed in Section 3.1. Aircraft Rescue and Fire Fighting (ARFF) facilities are provided by the U.S. Army and are located on the south side of the airfield. The ARFF houses the emergency fire suppression equipment for the airfield and provides the initial response to any aircraft fires. It is supported by the City of Sierra Vista Fire Department and Fort Huachuca, depending on the location of the incident. According to the September 1999, Airport/Facility Directory, the ARFF meets the requirements of an Index A facility (Coffman Associates 2001 per CBP 2015).

CBP SAR operations are vitally important to local and regional populations. Any restriction in the ability of CBP to provide SAR operations in the region would impact the health and human safety of undocumented aliens, as well as others.

3.19.2 Environmental Consequences

3.19.2.1 Alternative 1: No Action Alternative

No change in existing public health and safety would occur and no impact to public health and human safety is anticipated.

3.19.2.2 Alternative 2: Proposed Action Alternative

No direct impacts to public health and safety would occur with Alternative 2. The Proposed Action is located beyond the APZ clear zone and operations will follow all Occupational Safety and Health Administration (OSHA) health and safety guidelines, including compliance with the OSHA Hazard Communication Standard, updated in 2013 to the Globally Harmonized System. All OSHA construction safety standards will be adhered to during the construction process. Due to the proximity of fire suppression equipment and the current state of readiness of the fire station near the airfield, impacts associated with fire protection would be negligible. Since the Proposed Action is located within a limited access, secured area, no impact on public health and human safety is anticipated.

Potential health and safety impacts on the local population may occur during construction. Hazards associated with construction activities may include the possibility of improperly stored, protected, or operated equipment. Due to the relatively short duration of construction activities, industry standards for construction site safety, and limited exposure to the general public, health and safety impacts are anticipated to be negligible.

3.20 SUMMARY OF IMPACTS

Table 3-10 is provided to summarize the impacts of the No Action Alternative and the Proposed Action on each of the elements discussed in this section (Affected Environment).

Table 3-10. Summary Matrix of Potential Impacts

Resource	Alternative 1: No Action	Alternative 2: Proposed Action
Land Use	No impacts.	Land use is consistent with Fort Huachuca plans. The Proposed Action would have a negligible impact on land use.
Geology and Soils	No impacts.	Minor permanent impacts to soils from grading and excavation. Impacts will occur in a previously disturbed area. No impacts to local or regional geological conditions. Mitigation measures including a SWPP and BMPs will be developed and implemented.
Hydrology and Groundwater Table 3-10, continued	Due to prior mitigation, negligible impacts are expected on groundwater. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015.	Due to prior mitigation, negligible impacts are expected on groundwater. The Proposed Action is anticipated to have a one-time use of 6.74 AF and an annual water use of 19.08 AF/YR which has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR).
Surface Waters and Waters of the U.S.	No direct impacts at LAAF. Negligible indirect impacts on the San Pedro River.	No impacts to surface waters or waters of the U.S. would occur because none are present in the project area. Negligible impacts on the baseflow of the San Pedro River would occur as CBP has mitigated water use with surplus mitigation credits established in 2015.
Floodplains	No impacts.	Minor permanent modification of floodplain associated with linear taxiway crossing. No impacts anticipated to local and regional floodplains and drainage patterns.
Vegetative Habitat	No direct impacts at LAAF. Negligible indirect impacts on riparian vegetation in the SPRNCA due to baseline flow reduction of the San Pedro River. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015.	Negligible habitat loss of semi-desert grassland and/or mixed-desert scrub vegetation. Up to two agave plants may be relocated. Negligible indirect impacts on riparian vegetation in the SPRNCA due to baseline flow reduction of the San Pedro River. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.
Wildlife and Aquatic Resources	No direct impacts at LAAF. Negligible indirect impacts on wildlife or aquatic habitat in the SPRNCA. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015.	Negligible temporary impact on wildlife species during construction. No direct impact on aquatic species or habitat. Negligible indirect impacts on wildlife or aquatic habitat in the SPRNCA. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.

Resource	Alternative 1: No Action	Alternative 2: Proposed Action
Threatened and Endangered Species	No direct impacts on threatened and endangered species. Negligible indirect impacts on threatened and endangered species resulting from baseline flow reductions of the San Pedro River. CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015.	No direct impacts on threatened or endangered species. Negligible indirect impacts on threatened and endangered species because CBP mitigated for all CBP actions in the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action. The Proposed Action may affect but is not likely to adversely affect Federally listed species.
Cultural, Historical, and Archaeological Resources	No impacts.	No impacts. Any unidentified artifacts encountered during construction will be addressed during coordination with the Fort Huachuca archaeologist.
Air Quality	No impacts.	Negligible impacts during construction.
Climate	Negligible impact to climate from existing emissions being released into the atmosphere.	The total emissions from construction activities and additional exhaust emissions from aircraft and employee personal vehicle operations will have a negligible impact on climate.
Noise	No impacts.	Minor temporary impacts during construction. Negligible permanent increase in noise levels.
Utilities and Infrastructure	No impacts.	Minor permanent impacts resulting from the extension and use of existing utilities.
Roadways/Traffic	No impacts.	Negligible permanent impact to vehicular and aviation transportation resources.
Hazardous Materials	No impacts	No impacts.
Socioeconomic	No impacts.	Negligible impacts to employment and population in Cochise County.
Sustainability and Greening	No impacts	No impacts.
Human Health and Safety	No impacts.	Negligible impacts. Potential for temporary impacts during construction to be offset by standard construction site safety practices.

4.0 CUMULATIVE IMPACTS

This section of the EA defines cumulative impacts; identifies past, present, and reasonably foreseeable projects relevant to cumulative impacts; and analyzes the potential cumulative impacts associated with the implementation of the Proposed Action and other projects/programs planned within the ROI.

4.1 DEFINITION OF CUMULATIVE IMPACTS

The CEQ defines 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 actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, or local) or individuals. CEQ guidance on cumulative effects requires the definition of the scope of the other actions and their interrelationship with the Proposed Action (CEQ 1997). The scope must consider geographic and temporal overlaps with the Proposed Action and all other actions occurring within the ROI. Informed decision making is served by consideration of cumulative impacts resulting from activities that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future activities affecting any part of the human or natural environment impacted by the Proposed Action. Activities were identified for this analysis by reviewing CBP and USBP documents, news/press releases, and published media reports, and through consultation with planning and engineering departments of local governments and state and Federal agencies.

4.2 METHODS FOR CUMULATIVE IMPACT ANALYSIS

This cumulative impact analysis included three major tasks, as per the guidelines cited above:

1. Determine the scope of the cumulative analysis, including geographic extent, time frame, and relevant resources;
2. Conduct the cumulative effects analysis; and
3. Determine the cumulative impacts to relevant resources.

4.2.1 Scope of Cumulative Impact Analysis

Identification of Relevant Resources

Resources identified for consideration in the cumulative impacts analysis were those that were adversely impacted by the Proposed Action or Alternatives. If the Proposed Action or Alternatives did not result in direct or secondary impacts on a resource, then that resource was eliminated from the cumulative impact evaluation (CEQ 1997). Table 4-1 provides a summary of the decision-making process conducted to identify the relevant resources to be considered in this cumulative impacts analysis.

Table 4-1. Consideration of Resources for Cumulative Impacts Analysis

	Direct Impacts – Proposed Action	Indirect Impacts- Proposed Action	No Action Alternative	Cumulative Effects Analysis Required?	Detailed Analysis Warranted
Land Use	Negligible impact on land use as the project is designated for airport facilities.	Land use is consistent with Fort Huachuca Master plans.	Negligible impacts over existing baseline conditions.	No	No
Geology and Soils	Minor permanent impacts to soils from grading and excavation. Impacts will occur in a previously disturbed area. Development of a SWPPP and BMPs will reduce soil erosion by wind or heavy rain during construction and operation.	No impacts to local or regional geological conditions.	Negligible impacts over existing baseline conditions.	No	No
Hydrology and Groundwater	Negligible impact on groundwater levels, as CBP mitigated for groundwater use at all CBP facilities within the Sierra Vista Subwatershed, including the temporary facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.	Negligible indirect impacts on groundwater levels in the Sierra Vista Subwatershed.	Negligible impacts over existing baseline conditions. CBP mitigated for groundwater use for all CBP facilities in the Sierra Vista Subwatershed in 2015.	Yes	No
Surface Waters and Waters of the US	Negligible direct impact on surface waters. Mitigation measures including a SWPPP and BMPs will be developed and implemented.	Negligible indirect impacts on surface waters or Waters of the U.S. CBP mitigated for all CBP activities in the Sierra Vista Subwatershed, including the temporary CBP facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.	Negligible impacts over existing baseline conditions. CBP mitigated for groundwater use for all CBP facilities in the Sierra Vista Subwatershed in 2015.	Yes	No
Floodplains	Minor modification of floodplain associated with construction of the taxiway. No adverse impact on regional and local drainage patterns.	No impact.	No impact.	No	No
Vegetative Habitat	Negligible habitat loss of semi-desert grassland and/or mixed-desert scrub vegetation.	Negligible indirect impacts on vegetation due to a potential decrease in the baseflow of the San Pedro River. CBP mitigated for all CBP activities in the Sierra Vista Subwatershed, including the temporary CBP facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.	Negligible impacts over existing baseline conditions. CBP mitigated for groundwater use for all CBP facilities in the Sierra Vista Subwatershed in 2015.	No	No
Wildlife and Aquatic Resources	Negligible temporary impact on wildlife species during construction. No direct impact on aquatic species or habitat.	Negligible indirect impacts on wildlife and aquatic resources due to a potential decrease in the baseflow of the San Pedro River. CBP mitigated for all CBP activities in the Sierra Vista Subwatershed, including the temporary CBP facilities at LAAF in 2015. Surplus credits have been used to mitigate the Proposed Action.	Negligible impact over existing baseline conditions. CBP mitigated for groundwater use for all CBP facilities in the Sierra Vista Subwatershed in 2015.	Yes	No
Threatened and Endangered Species	No direct adverse impact on Federally listed species.	Negligible indirect impacts on threatened and endangered species due to a potential decrease in the baseflow of the San Pedro River. CBP mitigated for all CBP activities in the Sierra Vista Subwatershed, including the temporary CBP facilities at LAAF in 2015. Surplus credits have been used to mitigate for any indirect impacts associated with the Proposed Action. May affect but is not likely to adversely affect Federally listed species.	Negligible impacts over existing baseline conditions. CBP mitigated for groundwater use for all CBP facilities in the Sierra Vista Subwatershed in 2015.	Yes	No
Cultural, Historical, and Archaeological Resources	No impacts. Any unidentified artifacts encountered during construction will be addressed during coordination with the Installation's archaeologist.	No impacts	Negligible impacts over existing baseline conditions.	No	No
Air Quality	Negligible temporary impacts during construction. Since the new construction will meet sustainability requirements set by the Guiding Principles, it is expected that air emissions will be reduced.	Reduced impacts from improved energy efficiency.	Negligible impacts over existing baseline conditions.	No	No
Climate	The total emissions from construction activities and additional exhaust emissions from aircraft operations will have a negligible impact on climate. Since the new construction will meet sustainability requirements set by the Guiding Principles, it is expected that climate impacts will be reduced.	Reduced impacts from improved energy efficiency.	Negligible impacts over existing baseline conditions.	No	No
Noise	Negligible impacts on the noise contours at LAAF.	No impacts.	Negligible impacts over existing baseline conditions.	No	No
Utilities and Infrastructure	Minor permanent impacts resulting from the extension and use of existing utilities.	No impacts.	No impacts over existing baseline conditions.	No	No

	Direct Impacts – Proposed Action	Indirect Impacts- Proposed Action	No Action Alternative	Cumulative Effects Analysis Required?	Detailed Analysis Warranted
Roadways and Traffic	Negligible impact to vehicular and aviation transportation resources.	No impacts	No impacts over existing baseline conditions.	No	No
Hazardous Materials/Waste	No impacts over existing baseline conditions. An SPCC Plan and BMPs will be developed and implemented to minimize potential impact from Hazardous Material use and storage.	No impacts	No impacts over existing baseline conditions.	No	No
Socioeconomic	Negligible impacts to employment and population in Cochise County during construction.	No impacts	No impacts over existing baseline conditions.	No	No
Sustainability and Greening	No impact, per EO 13514, the new construction will be required to meet sustainability requirements set by the Energy Efficiency Guiding Principles.	Reduced impacts from improved energy efficiency.	No impacts over existing baseline conditions.	No	No
Human Health and Safety	No permanent impacts. Potential for negligible temporary impacts during construction to be offset by standard construction site safety practices.	No impacts	No impacts over existing baseline conditions.	No	No

Geographical Extent of Analysis

The geographic area of concern for a cumulative impacts analysis is typically defined by the extent of the influence of a potential action and its alternatives (CEQ 1997). The ROI for each of the resource areas in Section 3, Affected Environment and Consequences, was defined as the extent of influence of the Proposed Action and the Alternative with respect to the relevant resources.

Time Frame for Analysis

CEQ guidelines require that potential cumulative impacts be considered over a specified time period (i.e., from past through future). In order to assess the influence of a given action, a cumulative impact analysis should be conducted using existing, readily available data and the scoping of the cumulative impact analysis should be defined, in part, by data availability. The appropriate time for considering past, present, and reasonably foreseeable future projects can be the design life of a project, or future time frames used in local master plans and other available predictive data.

4.2.2 Impacts of Past and Present Actions

The impacts of past actions have been considered in the analysis of this EA in establishing the baseline against which the Proposed Action is compared. Three CBP missions currently occur within the Sierra Vista Subwatershed, the CBP Air Unit at LAAF, the Naco Border Patrol Station, and the Naco Port of Entry. The CBP Air Unit currently employees 47 personnel, the Naco Border Patrol Station employs approximately 450 personnel, and the Naco Port of Entry employs 38 personnel.

The total gross water use of the three facilities is 163.48 AF/YR (Appendix C). Specifically, the water use calculated for each facility is 130.46 AF/YR (Naco Station), 16.98 AF/YR (CBP Air Branch facilities at LAAF), and 16.04 AF/YR (Naco Port of Entry) (CBP 2010b and Appendix C). To offset water use, the design of the Naco Border Patrol Station incorporated rainwater-harvesting detention basins to improve recharge and offset water use for landscaping. It is estimated that approximately 35 AF/YR of infiltration occurs at the Naco Border Patrol Station as a result of the detention basins. With the inclusion of these rainwater harvesting detention basins, the total net water use of the three facilities is reduced to 128.48 AR/YR.

To offset the net water usage of CBP facilities in the Sierra Vista Subwatershed, in 2015 CBP acquired a 1,912-acre property and established a conservation easement to preclude future expansions in water use from development on this property within the Sierra Vista Subwatershed (Appendix C). The 1,912-acre conservation easement provided 210.60 AF/YR of water savings in the Sierra Vista Subwatershed. The total water savings is sufficient to mitigate the 128.48 AF/YR of net water use associated with the three CBP missions and provide a surplus of water saving credits of 82.12 AF/YR (Appendix C) to be used towards future projects.

The Proposed Action would have a one-time water use of 6.74 AF related to construction, which does not require ongoing mitigation, and 19.08 AF/YR from the 53 additional personnel. The additional annual groundwater use of 19.08 AF/YR has been mitigated with the existing surplus credit from the acquisition of the Flying H Ranch conservation easement and reduces the

remaining credit available to address future water mitigation needs to 63.04 AF/YR (82.12 AF/YR -19.08 AF/YR).

4.3 IMPACTS OF FUTURE ACTIONS

Fort Huachuca includes 73,142 acres and falls under the jurisdiction of the US Army Training and Doctrine Command. Fort Huachuca supports multiple Army and DoD aviation elements and is home to the primary restricted military UAS training airspace in the United States. Fort Huachuca is the region’s largest employer providing approximately 14,900 jobs in 2007 (U.S. Army 2007a). The 2017 *Real Property Master Plan Update* (U.S. Army, 2017) identifies two short-term projects adjacent to LAAF that may interact with the proposed project; Airfield North and Airfield South. Both projects could increase air traffic at LAAF as well as increase groundwater demand associated with new employment. The Airfield North, Enhanced Use Lease site is a 203 acre site north of LAAF and adjacent to Sierra Vista Municipal Airport. The U.S. Army and the City of Sierra Vista have a broad range of private leasing opportunities to maximize the utility and value of the parcel, but no developers are currently under contract. The Airfield South, Mission Expansion Plan includes 146 acres south of LAAF managed to support missions requiring proximity to LAAF within the secure cantonment area.

Fort Huachuca’s leadership in environmental conservation and stewardship has led to conservation measures including reduced groundwater demand and increased artificial and enhanced recharge of the groundwater system. The total effect of all the combined efforts initiated just by Fort Huachuca has been to reduce the gross groundwater consumption from 1,842 AF/YR in 2000 to 986 AF/YR in 2012, a reduction of 46 percent (ADPW 2013).

The Sierra Vista Subwatershed currently supports approximately 78,970 people and is projected to support over 170,000 people by 2050 (USDOI 2008). As noted in Table 4-2, Cochise County is projected to continue experiencing population growth, which may affect groundwater levels within the Sierra Vista Subwatershed. Groundwater serves as the primary water source for residential, commercial, agricultural, and industrial water users in Cochise County and the subwatershed.

Table 4-2. Cochise County Population Trends

Cochise County	1990	2000	2010	2020	2030	2040	2050
Total Population	97,642	117,755	146,037	169,717	187,725	201,179	212,822
Population Change	NA	20,113	28,282	23,680	18,008	13,454	11,643
Average Annual Percent Change	NA	2.1%	2.4%	1.6%	1.1%	0.7%	0.6%

4.4 CUMULATIVE EFFECTS ANALYSIS

The following sections address two resource areas (i.e., water resources and biological resources/threatened and endangered species) where impacts of the Proposed Action, in connection with related past, present and reasonably foreseeable future actions warrant further consideration due to elevated sensitivity regarding these resources in the Fort Huachuca area. The following sections are not meant to imply that the Proposed Action would create any significant contribution to cumulative impacts on these resources.

4.4.1 Water Resources

Hydrology and Groundwater; Surface Waters

The Sierra Vista subwatershed is an extremely active area with respect to water resource management activities. Concern about regional groundwater withdrawal and potential impacts to the stream flow in the San Pedro River have increased in recent years. Considerable effort has been devoted to assessing the nature and extent of these impacts, as well as to developing and implementing plans to mitigate any adverse impacts. The city of Sierra Vista, Fort Huachuca, numerous federal, state, and local agencies, and a large number of citizens and interest groups have been involved in this process (CBP 2010b). Over the past decade, tremendous progress has been made in reducing groundwater consumption rates in the Sierra Vista Subwatershed. This progress has come in the form of reduced groundwater demand both on-Installation and off-Installation and increased artificial and enhanced recharge of the groundwater system. Water use efficiency in the City of Sierra Vista as measured by per capita water use (GPCD) has improved from 180 GPCD in 2000 to 141 GPCD in 2012 despite a 21 percent population increase during the same time period (ADPW 2013).

In the case of Fort Huachuca, the reduction in water demand has occurred through a variety of measures including fixture upgrades (i.e., replacement of high water use plumbing fixtures with low water use fixtures), facility infrastructure removal/consolidation (i.e., demolition of facilities), aggressive leak detection and repair, water conservation education, and implementation of a strict landscape watering policy in military family housing. Agricultural pumping has decreased as a result of the retirement of agriculture associated with creation of the SPRNCA and through the purchase of conservation easements by Fort Huachuca in partnership with The Nature Conservancy and Cochise County (CBP 2010b).

The City of Sierra Vista and Fort Huachuca are actively pursuing and are in the process of implementing a wide variety of water recharge and consumption-reduction projects that will have a positive cumulative impact on regional water resources (Table 4-3).

Table 4-3. Major Water Resource Projects and Studies at Fort Huachuca

Project	Description / Goal	Status
Water Wise and Energy Smart Program (WWES)	Provide water and energy conservation education and related support services to U.S. Army, contractor employees, and family members who either work or live on Fort Huachuca.	Since January 2004, WWES has been conducting water conservation audits of facilities on the Installation. Thus far, these audits have resulted in water savings exceeding two AF/YR. In addition, in support of an Army Energy Conservation mandate, WWES staff began systematic Energy Audit inspections of the over 500 buildings on Fort Huachuca, auditing 61 buildings over 2,767,756 square feet, meeting the goal for energy audits for the first time
Military Family Housing (MFH) Whole Neighborhood Revitalization Projects	Upgrading military family housing (MFH) Installation-wide as part of a multi-year whole neighborhood revitalization effort expected to be complete in 2011.	Renovations began in 1995. Water use fixtures in new homes meet or exceed current building codes related to water use efficiency. In addition, all new homes are or will be equipped with air conditioning vs. evaporative cooling. The overall footprint of turf at new homes is being reduced from an estimated 3000 square feet per home to approximately 1800 square feet or less per home.
Replacement Of Industrial/Commercial Water Fixtures	Replace all installation flush urinals with waterless urinals, install 170 pressure assist toilets in 95 MFH housing units, and replace top loading washers with horizontal axis washers at military barracks laundry facilities and at the laundry facility.	Water savings associated with urinals are estimated at 66 AF/YR, water savings associated with toilet replacement are estimated to be 0.74 AF/YR. Top loading washer replacement is complete, resulting in water savings of approximately 17 AF/YR.
Reducing Consumptive Water Use	Reducing the portion of water pumped from the groundwater system that does not return to the wastewater treatment plant. Any reduction in consumptive water use essentially offsets groundwater pumping on a one-to-one basis (i.e., each gallon reduction in consumptive water use decreases pumping by one gallon).	Fort Huachuca has already taken a number of steps to reduce consumptive water use in the following areas: landscape irrigation, vehicle washing, firefighting activities, fire hydrant testing, construction-related water use (including dust control, soil moisture adjustment and testing/flushing of newly constructed water lines), facility climate control (including evaporative cooling and cooling tower water use), potable water distribution system testing/flushing, potable water distribution system leaks, swimming pool consumptive water use (including evaporation and leaks), and sewer conveyance losses (including sewer system leaks and sewage disposal through septic systems).
Fort Huachuca Irrigation and Water Management Policy (Policy 022)	This policy places restrictions on irrigation of turf in MFH. It also specifies procedures for activities that use water ensuring that water use efficiency is maximized. This policy also places restrictions and/or limits on outdoor decorative water features, new turf installation, and water use fixtures.	Policy implemented in May 2005. The impact of this policy cannot be readily quantified; however, it deserves partial credit for the significant reductions in groundwater pumping that have occurred at Fort Huachuca.

Source: USAGFH 2006

Installation urban growth and urban water consumption increases constitutes a risk to the Sierra Vista Subwatershed. Economic activities within the San Pedro River watershed in Mexico also pose a risk to the region's water resources. Ongoing expansion of mining in northern Mexico, combined with the possible development of at least one additional major mine within the basin would result in major increases in water consumption upstream of the U.S. - Mexico.

Overall, the future water resource in the region is complex and difficult to predict because it is comprised of both negative and positive trends. However, the contribution of the Proposed Action to cumulative impacts on water resources is not expected to be significant due to the mitigation measures outlined in Section 5 of this report.

4.4.2 Biological Resources

Wildlife and Aquatic Resources, Threatened and Endangered Species

Cumulative impacts to biological resources on Fort Huachuca and in the greater region are the result of the complex interactions of several different factors. The Installation's water resources utilization and conservation, as discussed above, is a factor in the overall future of local biological resources and protected species. It addresses both the groundwater and local riparian concerns, and will provide an important long-range contribution to the overall health of the region's biological resources, particularly that of the SPRNCA. The SPRNCA is critical habitat for a number of species (to include avian, plant, and fish) and serves as a significant international migratory bird corridor in the Southwest.

In the larger regional and international context, Fort Huachuca's contribution to cumulative impacts on biological resources has been positive for many years. Fort Huachuca serves as a federal protectorate of several species of Federally protected threatened and endangered species and their on-Installation habitats (CBP 2010). Additionally, Fort Huachuca has implemented numerous actions to protect Federally listed threatened and endangered as well as candidate species and their habitat across the installation. These include, but are not limited to the following measures:

- Off road travel and pyrotechnics are prohibited in Agave Management Areas.
- Off road travel is prohibited.
- Warning signs and physical protection (i.e., boulders, fencing, etc.) have been completed and are being maintained.
- Annual reports have been submitted and current year work plans developed. Fort Huachuca will continue to report and jointly develop work plans with the USFWS.

As discussed in Sections 3.5 and 3.6, the various components of the Proposed Action would have no contribution to trends in biological resources already being experienced on Fort Huachuca or in the region. With respect to the SPRNCA, the Proposed Action would have no direct impact on biological conditions and the quality of habitat in the area.

Another regional issue that presents significant environmental concerns to biological resources is the intrusion of non-native or exotic species into the area and the accompanying displacement of vulnerable native species. Some non-native species have shown the ability under current conditions to out-compete native species. These include fish species in the San Pedro River,

grasses (i.e., buffel, Johnson, and Lehmann's love grass), bullfrogs, and tamarisk. The Proposed Action does not contribute to any cumulative impact with respect to non-native species (CBP 2010b). However, it may be necessary to implement a maintenance plan for control of invasive species once the construction is complete.

5.0 MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

CBP will follow design criteria to reduce adverse environmental impacts and has implemented mitigation measures to offset adverse environmental impacts. Design criteria to reduce adverse environmental impacts include avoiding or minimizing physical disturbance and construction to sensitive resources, consulting with Federal and State agencies and other stakeholders, and developing appropriate BMPs.

5.1 GENERAL MITIGATION MEASURES

BMPs that should be implemented as standard operating procedures during all construction activities would include proper handling, storage, and/or disposal of hazardous and/or regulated materials. Standard procedures will include the implementation of a Construction Mitigation and Restoration Plan; SPCCP; SWPPP; Dust Control Plan; Fire Prevention and Suppression Plan; and Unanticipated Discovery Plan for Cultural Resources.

Lighting impacts during construction and maintenance activities will be avoided by conducting these activities during daylight hours only. Lighting impacts during construction and maintenance activities will be avoided by conducting these activities during the daylight hours only. During operations, CBP will 1) use special bulbs designed to ensure no increase in ambient light conditions, 2) minimize the number of lights used, 3) place lights on poles pointed down toward the ground, with shields on lights to prevent light from going up into sky, or out laterally into landscape, and 4) selectively place lights so they are directed away from all native vegetative communities.

Environmental design measures and/or mitigation are presented for each resource category that could be affected. The proposed measures will be coordinated through the appropriate agencies and land managers/administrators prior to initiation of construction.

5.2 LAND USE

No mitigation measures required.

5.3 GEOLOGY AND SOILS

Soil erosion can be greatly reduced with the use of SWPPP and other appropriate BMPs. Provisions of the Arizona Pollutant Discharge Elimination System (Arizona Administrative Code, Title 8, Chapter 9 and United States Code 1251 et seq.) require construction projects disturbing more than 1 acre to have a SWPPP that includes BMPs. These BMPs are designed to minimize soil erosion and protect surface water quality. By statute, BMPs must include erosion and sediment controls, interim and permanent stabilization practices, velocity dissipation devices in discharge locations and outfall channels, and a description of post-construction storm water management measures. A SWPPP is required prior to project implementation.

5.4 HYDROLOGY AND GROUNDWATER

Substantial quantifiable, measurable, and timely conservation measures should be included as part of the Proposed Action. The primary focus should be on conservation measures that show a direct and measurable reduction of net groundwater use in the Sierra Vista Subwatershed.

5.4.1 Water Conservation

The Universal Plumbing Code has been adopted as an Arizona State Statute and requires that new construction use low-flow water use fixtures. While the Federal Government is not required to comply with State codes, low-flow water use fixtures will be considered during the design of Alternative 2.

5.4.2 Large Water Use Audits

Audits are performed through the University of Arizona Cooperative Extension's Water Wise program. CBP AMO could request an audit of the facility in an effort to identify specific measures, which could be implemented to increase water use efficiency. The audit may identify water use activities which could be altered to reduce water consumption. CBP AMO would not only reduce total water usage through adopting recommended conservation techniques, but it also would see a commensurate water bill decrease. Although conservation alternatives reduce the volume of water that could potentially be recharged, conservation is more efficient than consuming the water less efficiently and then recharging the generated wastewater.

5.4.3 Rainwater Harvesting

Rainwater harvesting could be included as a design feature in Alternative 2. The land required to install the collection system and dry wells would need to be included in CBP's contract with the U.S. Army. Furthermore, given the nature of this type of recharge activity, approval from Fort Huachuca would likely be required. By recharging the loss in supply, CBP could reduce the amount of water mitigation that will be required to offset the use.

5.4.4 Conservation Easements

Conservation easements are aimed at reducing or eliminating water consumption along the San Pedro River and its tributaries. Property owners' relinquish water rights in exchange for accepting a conservation easement; the reduced water use can then be used as an offset for water used within the Subwatershed.

In 2015, CBP established 210.60 AF/YR of water savings credits to offset net water use at all CBP facilities (128.48 AF/YR) in the Sierra Vista Subwatershed (Appendix C). The remaining credits have been used to offset the impacts on groundwater expected from the Proposed Action. The Proposed Action would have a one-time water use of 19.08 AF/YR of water use associated with operations of the Proposed Action.

5.4.5 Detention Basin Recharge

Stormwater from the CBP site goes to East range and is recharged in Fort Huachuca's stormwater Recharge system. Water collected and recharged within the basin would reduce the amount of water that would need to be mitigated by other means.

5.5 SURFACE WATERS AND WATERS OF THE U.S.

A SWPPP will be developed to minimize potential water quality impacts. Coordination with USACE regarding Nationwide Permit General Conditions will need to be completed prior to construction activities in the un-named wash.

5.6 FLOODPLAINS

Coordination will continue with the U.S. Army to obtain recent hydraulic/hydrologic studies determining the boundaries of 100-year and 500-year floodplains.

5.7 VEGETATIVE HABITAT

CBP will coordinate with the U.S. Army for the relocation of any previously undiscovered agave that may be found during construction of the project. It may be necessary to implement a maintenance plan for control of invasive species once the construction is complete. Mitigation measures will be required by Fort Huachuca (FH) to prevent the spread of invasive species. These measures will include cleaning construction equipment before accessing FH, ensuring any fill material (dirt, rock, gravel, etc.) will be certified weed-free, and any landscaping will select plants from the FH approved plant list. If vegetation is disturbed or removed during construction CBP will be required to reestablish vegetation on bare ground using an Environmental Natural Resources Division (ENRD) approved native grass seed mixture. CBP has provided mitigation for water use, per Section 5.4, to offset proposed water use that could indirectly affect vegetation communities in the SPRNCA.

5.8 WILDLIFE AND AQUATIC RESOURCES

To avoid impacts to migratory birds, CBP will avoid construction activities during migratory bird nesting season (March 15 – September 15) to the extent practicable. If construction is necessary during the migratory bird nesting season, surveys will be conducted prior to scheduled activity to determine if active nests are present within the area of impact. If active nests are identified within or in the vicinity of a project site, a buffer zone will be established around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area or the nest fails.

Existing facilities scheduled for demolition will be evaluated for the presence of bats and appropriate mitigation measures and BMPs will be implemented.

Monitor for desert box turtles during periods of expected desert box turtle activity. The construction area will be surveyed prior to daily work activities and any desert box turtles observed will be relocated outside the project area.

Open holes will be filled or covered at the end of each work day to prevent wildlife entrapment. Open trenches will be covered or ramps earthen ramps or wood planks will be located in the trench every 250 feet. Ramps and wood planks would be sloped less than 45 degrees.

All holes and trenches left open overnight will be inspected in the morning prior to daily construction activities or backfilling.

5.9 THREATENED AND ENDANGERED SPECIES

Groundwater mitigation measures are addressed in Section 5.4. Practices presented in sections 5.7 and 5.8 apply to all plant, wildlife, and aquatic resources.

5.10 CULTURAL RESOURCES

All construction will be kept within previously surveyed areas. Cultural resources surveys were conducted and concluded there would be no impacts. If previously unidentified human remains or funerary objects are encountered during activity related to the project construction, the contractor will stop work immediately at that location and take all reasonable steps to secure the preservation of those resources, per the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.) and A.R.S. §41-865. In this event, the project proponent, grading contractor, or CBP representative will immediately contact CBP's Environmental Officer and the Fort Huachuca's Cultural Resources Manager. The Installation's Cultural Resources Manager, in coordination with CBP, will make arrangements for the proper treatment of those resources.

5.11 AIR QUALITY

Fugitive dust will be minimized during construction activities through the implementation of BMPs to provide on-site dust suppression as described in Section 5.3.

5.12 CLIMATE

Identification and selection of possible minimization strategies of GHG emissions is an important part of addressing potential climate change impacts, even on a small scale. During design, CBP will consider typical reduction measures such as building design and efficiency, photovoltaic cells, provisions for plug-in electric vehicles (PHEV) and bicycles, and potential vehicle fleet reduction or substitution, in compliance with E.O. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance, 2009*, and the Energy Efficiency Guiding Principles.

5.13 NOISE

No mitigation measures required.

5.14 UTILITIES AND INFRASTRUCTURE

Special light bulbs designed to ensure no increase in ambient light conditions will be utilized in outdoors lighting fixtures. The project will be designed to utilize the minimum number of lights necessary. Lights will be directed towards the ground with shields to prevent ambient light from entering the sky.

Lighting designs will adhere to the Department of Defense Unified Facility Criteria (UFC) Interior and Exterior Lighting Systems and Controls (UFC 3-530-01).

5.15 ROADWAYS/TRAFFIC

No mitigation measures required.

5.16 HAZARDOUS MATERIALS

During construction or facility operation, contamination could occur as a result of petroleum, oil, or lubricant spills, or other hazardous material handling. To preclude such impacts, these substances will be stored, handled, and disposed of in accordance with local, State, and Federal laws and regulations.

5.17 SOCIOECONOMIC

No mitigation measures required.

5.18 SUSTAINABILITY AND GREENING

Consistent with DHS's policy for environmental stewardship, listed in Directive 025-01 - Sustainable Practices for Environment, Energy, and Transportation Management, the proposed action will implement on-site solid waste reduction and recycling, energy conservation, and source reduction and pollution prevention programs as practicable. In compliance with E.O. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance, 2009*, the facility design of Alternative 2 would have opportunities to incorporate energy conservation measures as part of the new construction, such as green roofs. Per DHS Strategic Sustainability Performance Plan (2013), the Proposed Action would set goals for environmentally sustainable practices in the daily operation and maintenance of the existing facility potentially including GHG reduction, fleet management, water use efficiency, pollution prevention, and waste reduction.

5.19 HUMAN HEALTH AND SAFETY

Construction site safety will adhere to OSHA and USEPA standards imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The OSHA and USEPA issue standards that specifies the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors. Operations will include compliance with the OSHA Hazard Communications Standard, which is amended to include the Globally Harmonized System.

6.0 REFERENCES

- Altschul, Jeffrey H. and Bruce A. Jones. 1990. Settlement Trends in the Middle San Pedro Valley: A Cultural Resources Sample Survey of the Fort Huachuca Military Reservation. Statistical Research Technical Series No. 19. Tucson.
- Arizona Air National Guard. 2008. Draft Environmental Assessment for Proposed MQ-1 Predator Beddown at Fort Huachuca.
- ADEQ. 2009. Air Quality Control Regions. Retrieved on 6/17/2009 from <http://www.azdeq.gov/ environ/air/permits/download/psd.pdf>.
- Arizona Department of Public Works (ADPW). 2013. Area Water Use, Environmental Services Division. Retrieved on 8/19/2013 from http://www.sierravistaaz.gov/egov/docs/1366242084_664428.pdf.
- Arizona Department of Water Works (ADWR). 1991. Nov. Hydrographic survey report for the San Pedro River watershed. Volume 1: general assessment, in re the general adjudication of the Gila River system and source. Phoenix, AZ: ADWR. Filed with the Court, November 20, 1991, 548 pgs.
- ADWR. 1994. Upper San Pedro River Case Study. Pages 147-208 in Arizona riparian protection program, legislative report, July 1994.
- ADWR. 2005. Upper San Pedro Basin Active Management Area Review Report. Bureau of Land Management (BLM). 2009. San Pedro Riparian Conservation Area. Downloaded May 19, 2009. http://www.blm.gov/az/st/en/prog/blm_special_areas/ncarea/sprnca.html.
- ADWR. 2009. Upper San Pedro Basin. Retrieved on 10/5/2009 from http://www.adwr.state.az.us/azdwr/content/Find_by_Program/Rural_Programs/content/map/UppSanPedPar.htm.
- ADWR. 2017. ADWR Demonstration Project Report: *De Minimis* Assessment & Cone of Depression Test Methodology – San Pedro River Watershed. Arizona Department of Water Resources.
- Arizona Office of Economic Development. 2019a. Estimates for 1980-2019 in Excel File (XLSX, 76 KB). Retrieved on 1/28/2020 from <https://population.az.gov/sites/default/files/documents/files/pop-estimates-1980-2019.xlsx>.
- Arizona Office of Economic Development. 2019b. Cochise County – 2019 to 2055 Projections (XLSX 22KB). Retrieved on 1/28/2020 from <https://population.az.gov/sites/default/files/documents/files/pop-prj-04003citir-19-55.xlsx>.

- Callegary, J.B., Minjarez Sosa, I., Tapia Villasenor, E.M., dos Santos, P., Monreal Saavedra, R., Grijalva Noriega, F.J., Huth, A.K., Gray, F., Scott, C.A., Megdal, S.B., Oroz Ramos, L.A., Rangel Medina, M., Leenhouts, J.M., 2016. San Pedro River Aquifer Binational Report: International Boundary and Water Commission, 170 p.
- Coffman Associates. 2001. Environmental Assessment for the Transfer and Development of 203 Acres of Property adjacent to Sierra Vista Municipal Airport, Sierra Vista, Arizona.
- Council on Environmental Quality (CEQ). 1997. Considering Cumulative Effects Under the National Environmental Policy Act.
- Daw, Sandra. 2013. Southwestern Willow Flycatcher. URL: <http://nps.gov/articles/southwestern-willow-flycatcher>. Htm. Last accessed May 20, 2021.
- Environmental Data Resources, Inc. 2007. The EDR-Radius Map with GeoCheck Report: Libby Army Air Field, Fort Huachuca, Inquiry Number 1970443.2s.
- Federal Aviation Administration (FAA). 2019. Airport Data and Information Portal, Sierra Vista Municipal Airport – Libby Army Airfield. Internet URL: <http://adip.faa.gov/agis/public/#/airportData/FHU>. Last accessed December 12, 2019.
- Federal Register. 2018. Endangered and Threatened Wildlife and Plants: Removal of the Lesser Long-Nosed Bat From the Federal List of Endangered and Threatened Wildlife. Volume 83, No. 75. Wednesday, April 18, 2018.
- Hart, David. 2019. Cultural Resources Inventory of Approximately 4 Acres for a Proposed Parking Area and Taxiway for the U.S. Customs and Border Protection Located within Fort Huachuca, Cochise County, Arizona.
- Hastings, James. 1959. The Tragedy at Camp Grant. Arizona and the West 1:5–11.
- Leenhouts, James, et al. 2006. Hydrologic Requirements of and Evapotranspiration by Riparian Vegetation along the San Pedro River, Arizona. Fact Sheet 2006-3027.
- Realtor.com. 2019. Real Estate Listings and Sierra Vista Homes for Sale. Retrieved on 12/10/2019 from <http://www.realtor.com/realestateandhomes-search/Sierra-Vista-AZ/>.
- Smith, C. 1981. Fort Huachuca: The Story of a Frontier Post. Government Printing Office, Washington, D.C.
- Thyse, D. 2007. Cultural Resources Survey of 72.77 Acres Surveyed for the Construction of New Facilities at Libby Army Airfield/Sierra Vista Municipal Airport, Fort Huachuca/Sierra Vista, Cochise County, Arizona. Michael Baker Jr., Inc., September.

- U.S. Army. 2000. Environmental Assessment, Comprehensive Unmanned Aerial Vehicle Testing and Training at Fort Huachuca, Arizona. Prepared by the Environmental and Natural Resources Division, Directorate of Installation Support, U.S. Army Garrison, Fort Huachuca, Arizona.
- U.S. Army. 2013. Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona. Environmental and Natural Resource Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona. December 2006, with 2/12/07 revisions.
- U.S. Army. 2017. Real Property Master Plan Update. Fort Huachuca, Arizona.
- U.S. Army Garrison, Fort Huachuca (USAGFH). 2000. Environmental Assessment, Comprehensive Aerial Vehicle Testing and Training at Fort Huachuca, Arizona. June 2000.
- USAGFH. 2004. Programmatic Environmental Assessment, Future Development Plan, USAGFH, Fort Huachuca, Arizona. November 2004.
- U.S. Army Public Health Center (APHC). 2018. Fort Huachuca Installation Compatible Use Zone Study. APHC, Aberdeen Proving Ground, Maryland. May 2018.
- U.S. Census Bureau. 2019. American Fact Finder, Cochise County, Arizona, Selected Economic Characteristics. Retrieved on 1/28/2020 from <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.
- U.S. Customs and Border Protection (CBP). 2010a. Draft Supplemental Environmental Assessment for the Proposed Customs and Border Protection Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona.
- CBP. 2010b. Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the San Pedro Watershed. February 2010.
- CBP. 2012. Border Patrol Strategic Plan, 2012-2016. Office of Border Patrol. Available online: https://nemo.cbp.gov/obp/bp_strategic_plan.pdf . Last accessed: 6 June 2019.
- CBP. 2015. Final Environmental Assessment for the Proposed Customs and Border Protection Air and Marine Joint Permanent Air Facility at Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona.
- CBP. 2019a. 2020 U.S. Border Patrol Strategy. CBP Publication No. 0928-0819. August 2019.

- CBP. 2019b. Final Biological Resources Survey Report for the Joint Permanent Air Operations Facility at Libby Army Airfield, Fort Huachuca, Arizona. U.S. Border Patrol, Tucson Sector, U.S. Customs and Border Protection. Department of Homeland Security, Washington, D.C. August 2019.
- CBP. 2021. Current and Proposed Future CBP Sorties Schedule During a 24-Hour Period at Libby Army Airfield. AMO Deputy Chief via an email to Kreg Ellzey (kreg.d.ellzey@associates.cbp.dhs.gov). May 19, 2021.
- U.S. Army. 2013. Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Environmental and Natural Resource Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona. December 2006, with 2/12/2007 Revisions.
- U.S. Department of the Interior (USDOI). 2008. Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2007 Report to Congress.
- USDOI. 2014. Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona 2012 report to Congress: Washington, D.C., U.S. Department of Interior, 24 p.
- U.S. Department of Transportation (USDOT). 1984. Airport Noise Compatibility Planning; Development of Submission of Airport Operator’s Noise Exposure Map and Noise Compatibility Program. 14 CFR Parts 11 and 150, Federal Register 49(244). December 2004.
- U.S. Environmental Protection Agency (USEPA). 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. December 31.
- USEPA. 2006. EPA Guidance Document AP-42, Fifth Edition, Volume I, Chapter 13, January, 1995, updated November 2006.
- USEPA. 2009. National Ambient Air Quality Standards. Retrieved on 6/17/2009 from <http://www.epa.gov/air/criteria.html>.
- USEPA. 2019. Nonattainment Areas for Criteria Pollutants (Green Book). Updated November 30, 2019.
- U.S. Fish and Wildlife Service (USFWS). 1999. Endangered and threatened wildlife plants; Designation of Critical Habitat for Huachuca Water Umbel. A plant. Final rule. 50 CFR Part 17. July 12, 1999. Federal Register 64 (132); 37441-37453.
- USFWS. 2008. Biological Opinion on Aquatic Species Conservation at the San Pedro Riparian and Las Cienegas National Conservation Areas, Arizona. December 31, 2008.
- USFWS. 2006a. Hydrologic Requirements of and Consumptive Ground-Water Use by Riparian Vegetation along the San Pedro River, Arizona.

- USFWS. 2007b. Chiricahua Leopard Frog (*Rana chiricahuensis*) Final Recovery Plan. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico.
- USFWS. 2007c. Final Biological Opinion for the Proposed Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona. June 14, 2007.
- USFWS. 2013. Designation of Critical Habitat for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake: Proposed Rule.
- USFWS. 2014. Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo.
- USFWS. 2016. Recovery Plan for the Ocelot (*Leopardus pardalis*) First Revision. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico.
- USFWS. 2018a. Questions and Answers: Lesser Long-nosed Bat Delisting. Internet [URL: \\www.fws.gov/home/feature/2018/pdf/LLNB-De;listing-FAQs-4-17-2018.pdf](https://www.fws.gov/home/feature/2018/pdf/LLNB-De;listing-FAQs-4-17-2018.pdf). April 17, 2018.
- USFWS. 2018b. Jaguar Recovery Plan Final. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico.
- USFWS. 2021a. Species Profile for Southwestern Willow Flycatcher. [URL: \\www.ecos.fws.gov/ecp/species/6749](https://www.ecos.fws.gov/ecp/species/6749). Last accessed May 20, 2021.
- USFWS. 2021b. Species Profile for Gila Topminnow (includes) Yaqui. [URL: \\www.ecos.fws.gov/ecp/species/1116](https://www.ecos.fws.gov/ecp/species/1116). Last accessed May 21, 2021.
- U.S. Geological Survey (USGS). 2006. Trends in Streamflow of the San Pedro River, Southeastern Arizona, and Regional Trends in Precipitation and Streamflow in Southeastern Arizona and Southwestern New Mexico: U.S. Geological Survey Professional Paper 1712, 79 p. Thomas, B.E., Pool, D.R.
- U.S. Geological Survey (USGS). 2007. Water Budgets: Foundations for Effective Water-Resources and Environmental Management. Richard W. Healy, Thomas C. Winter, James W. LaBaugh, and O. Lehn Franke. Circular 1308.
- USGS. 2019a. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona. Scientific Investigations Report 2016-5114, Version 1.3.
- USGS. 2019b. National Water Information System. Internet URL: <https://waterdata.usgs.gov/az/nwis/current/?type=flow>. Last Accessed 01/16/2020.

U.S. Immigration and Naturalization Service (INS). 2003. Environmental Assessment for Expansion of U.S. Border Patrol Air Operations and Facilities. U.S. Border Patrol Tucson Sector, Arizona. January 2003.

Upper San Pedro Partnership (USPP). 2009. USPP Background information. Retrieved on June 21, 2020 from <http://www.usppartnership.com>.

Upper San Pedro Partnership (USPP). 2020. USPP Background information. Retrieved on January 21, 2020 from <http://www.usppartnership.com>.

Weatherbase. 2020. Fort Huachuca, Arizona. Internet URL:
<https://www.weatherbase.com/weather/weather.php3?s=887208&cityname=FortHuachuc=Arizona-United-State-of-America>.

7.0 ACRONYMS/ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AF	Acre-Feet
AF/YR	Acre-feet per year
amsl	Above Mean Sea Level
APHC	United States Army Public Health Center
APZ(s)	Accident potential zone(s)
ARFF	Aircraft Rescue and Fire Fighting
ASTL	Arizona State Trust Lands
ATC	Air Traffic Control
AU	Air Unit
BLM	Bureau of Land Management
BMP(s)	Best management practice(s)
CBP	Customs and Border Protection
CCTV	Closed Circuit Television
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CO	Carbon monoxide
dBA(s)	A-weighted decibel(s)
dB(s)	decibel(s)
EDMS	Emissions and Dispersion Modeling System
DHS	Department of Homeland Security
DoD	Department of Defense
E.O.	Executive Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMD	Environmental Management Division
ENRD	Environmental Natural Resources Division
ESA	Endangered Species Act
EUL	Enhanced-use lease
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FH	Fort Huachuca
GHG	Greenhouse Gas
INM	Integrated Noise Model
INS	Immigration and Naturalization Service
km/h	Kilometer per hour
LAAF	Libby Army Airfield
Leq	Equivalent noise value
LUST	Leaking Underground Storage Tanks
µg /m3	Micrograms per cubic meter

mph	Miles per hour
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NASOC	National Air Security Operations Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NM	Nautical miles
NOA	Notice of Availability
NOI	Notice of Intent
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen oxides
NRHP	National Register of Historic Places
NWP	Nationwide Permit
AMO	Air and Marine Operations
OSHA	Occupational Safety and Health Administration
O ₃	Ozone
Pb	Lead
PM _{2.5}	Particulate matter smaller than 2.5 microns in diameter
PM ₁₀	Particulate matter smaller than 10 microns in diameter
ppm	Parts Per Million
ROI	Region of influence
RPMP	Real Property Master Plan
SAR	Search and rescue
SEA	Supplemental Environmental Assessment
SF	Square feet
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	Sulfur dioxide
SPCCP	Spill Prevention Control and Countermeasures Plan
SPRNCA	San Pedro Riparian National Conservation Area
SR	State Route
SVAU	Sierra Vista Air Unit
SVMA	Sierra Vista Municipal Airport
SWPPP	Storm Water Pollution Prevention Plan
TEP	Tucson Electric Power
TSP	Total Suspended Particulates
U.S.	United States
UAS(s)	Unmanned aircraft system(s)
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USAGFH	United States Army Garrison Fort Huachuca
USBP	United States Border Patrol
USFWS	United States Fish & Wildlife Service
USPB	Upper San Pedro Basin
USPP	Upper San Pedro Partnership
VOC	Volatile Organic Compounds

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The following people were primarily responsible for preparing this EA.

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Marcela Guillot	GSRC	GIS/Graphics	2 years of GIS/graphics	GIS/graphics

APPENDIX A
AGENCY COORDINATION

**SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FOR
PROPOSED U.S. CUSTOMS AND BORDER PROTECTION
PERMANENT AIR AND MARINE FACILITY AT LIBBY ARMY AIRFIELD
FORT HUACHUCA, ARIZONA**

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The letter below will be sent to all recipients on the mailing list.



Date: 12/20/2019

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Subject: Proposed Construction and Operation of U.S. Customs and Border Protection Facilities at Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona

Dear Ms. Markstein:

U.S. Customs and Border Protection (CBP) proposes to construct, operate, and maintain a joint permanent air operation facility at Libby Army Airfield (LAAF), Fort Huachuca, Cochise County, Arizona (Attachment A, Figure 1). CBP previously completed a Draft Supplemental Environmental Assessment (SEA) and Final Environmental Assessment (EA) to evaluate various potential parcels near LAAF for construction of a permanent facility. CBP completed a Draft SEA in 2010; however, prior to completion, the Army requested CBP consider a different location. Accordingly, CBP considered a different parcel that was also located on the air field, and in 2016 a Final EA was completed for that location. Most recently, however, the Army and CBP have a desire to construct the facility at the parcel originally considered as the Proposed Action in the 2010 SEA.

Although the 2010 SEA was never circulated for public review (and a Finding of No Significant Impact [FONSI] was not signed), all of the necessary survey work was completed and Section 106 consultation with the Arizona State Historic Preservation Office and relevant tribes for the proposed parcel was completed. CBP plans to update the Draft SEA (2010) for the proposed CBP Office of Air and Marine facility at LAAF, Fort Huachuca, Arizona.

The project includes the construction of a taxiway (50,300 square feet [SF]), an aircraft ramp including a helipad (129,210 SF), an administration facility (10,000 SF) positioned on a 261,088-SF area, and a parking area with spaces for 100 vehicles (122,143 (Appendix A, Figure 2). As part of the update to the 2010 Draft SEA, CBP will be including an additional 2.8-acre parking area and an additional 1.2-acre taxiway proposed as part of the new project. CBP recently completed cultural and biological surveys of the additional areas.

CBP is gathering data and input from state and local governmental agencies, departments, and bureaus that may be affected by, or otherwise have an interest in, this undertaking. Since your agency or organization may have particular knowledge and expertise regarding potential environmental impacts from CBP's Proposed Action, your input is sought regarding the likely or anticipated environmental effects of this undertaking. Your response should include any state

Ms. Markstein

Page 2

and local restrictions, permitting, or other requirements with which CBP would have to comply during project siting, construction, and operation.

Per DHS Directive 023-1, Environmental Planning Program, we will provide your agency with a copy of the official Draft SEA for the Joint Permanent Air Operations Facility for review and comment. Please let us know if additional copies are needed.

Your prompt attention to this request is appreciated. If you have any questions, please contact me at (949) 643-6392 or via email at joseph.zidron@cbp.dhs.gov.

Sincerely,

A handwritten signature in blue ink that reads "Joseph Zidron". The signature is fluid and cursive, with the first name being more prominent.

Joseph Zidron
Real Estate and Environmental Branch Chief
Border Patrol & Air and Marine Program Management Office
U.S. Customs and Border Protection

Enclosure

Attachment A
Figures

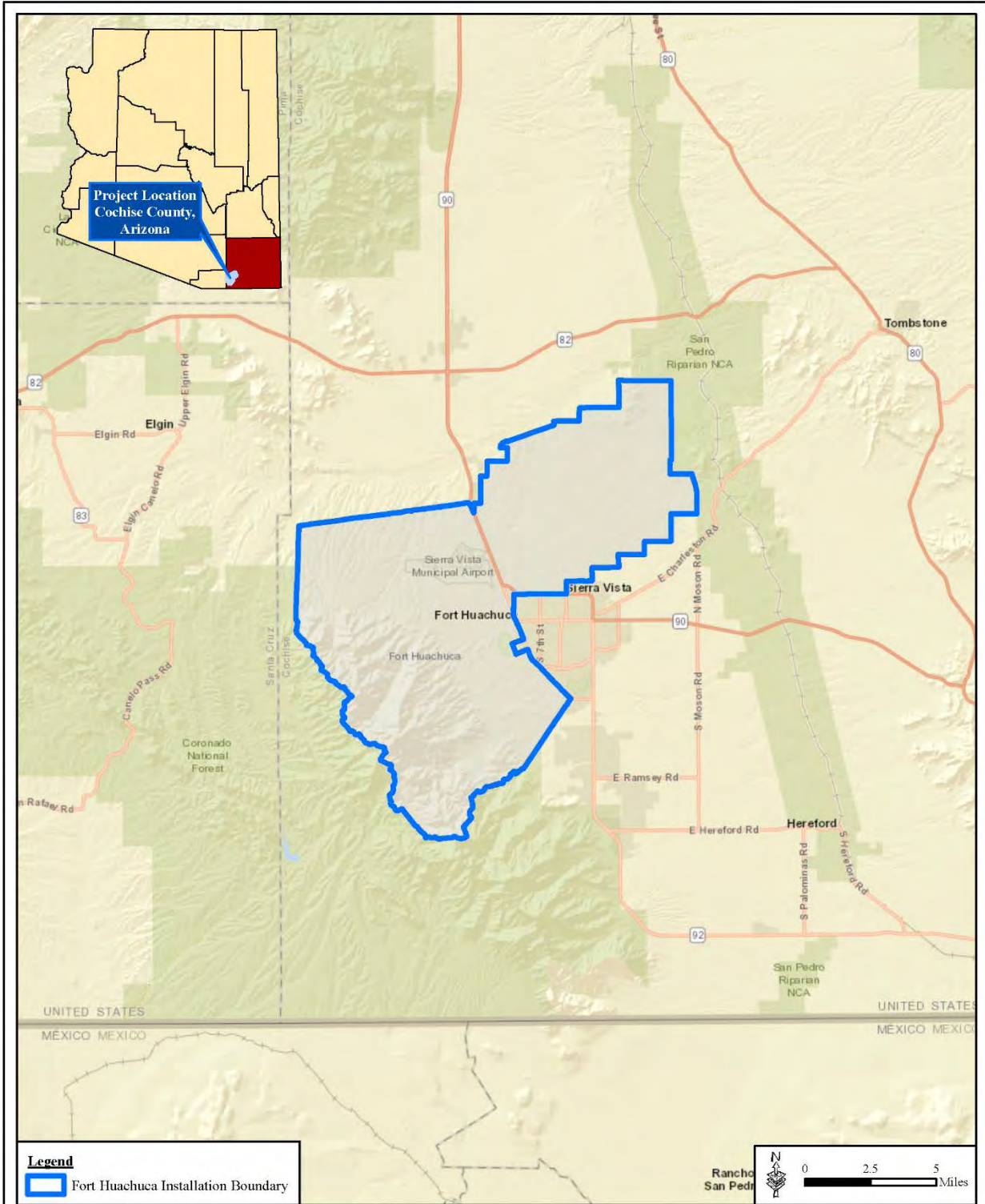


Figure 1-1. Vicinity Map



January 2020

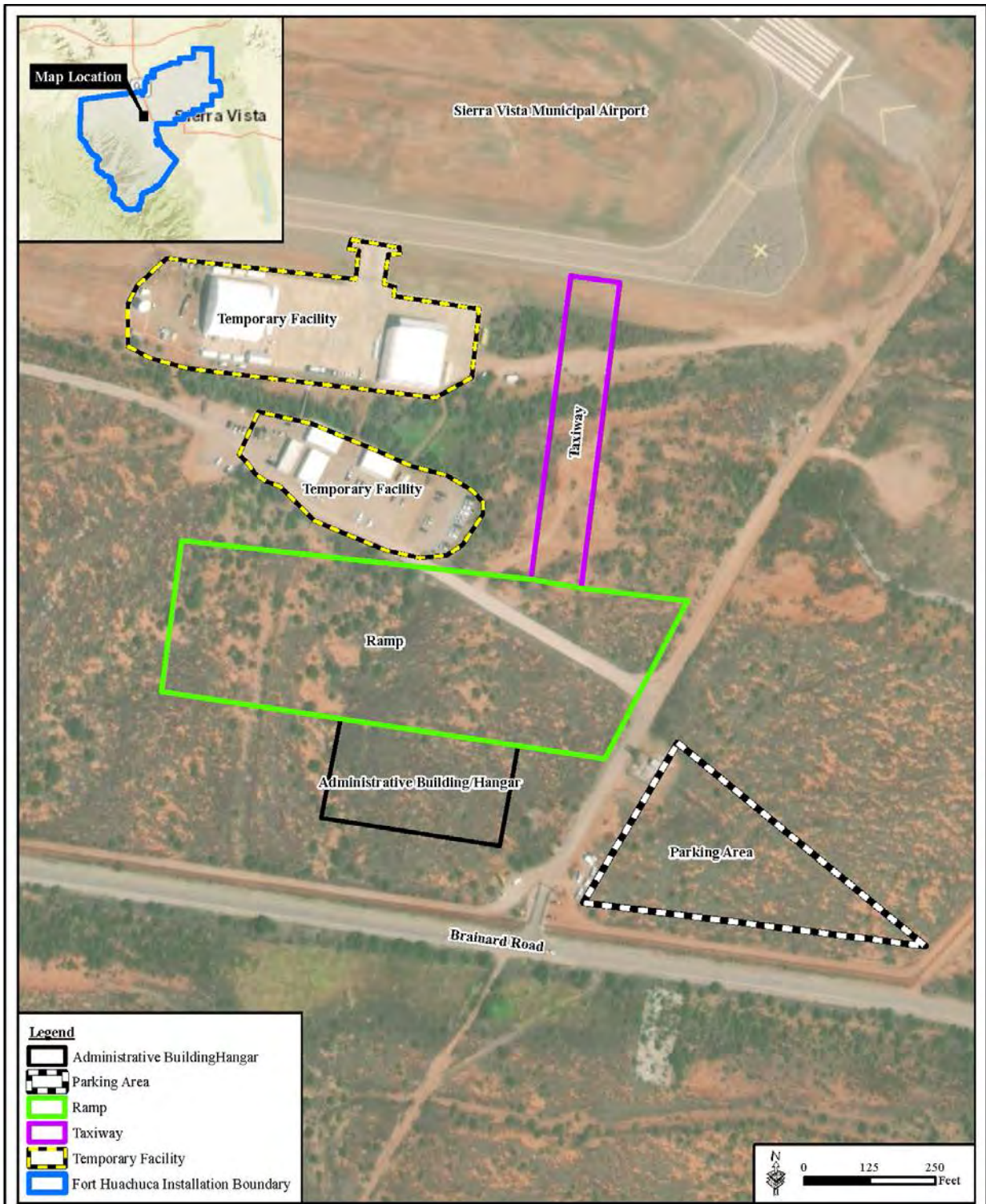


Figure 2-2. Proposed Action Site Configuration Map

Mailing List
Tribal Coordination Letters

Distribution List

Chairman Robert Miguel
Ak Chin Indian Community
42507 West Peters & Nail Road
Maricopa , AZ 85138

Governor Steven Roe Lewis
Gila River Indian Community
P.O. Box 97
Sacaton, AZ 85147

Chairman Edward Manuel
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634

Mr. Jefford Francisco
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634

Mr. Peter Steer
Tribal Historic Preservation Officer
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634

Ms. Holly Barton
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634

Mr. Stewart Koyiyumptewa
Director, Cultural Preservation Office
Hopi Tribe
P.O. Box 123
Kykotsmovi, AZ 86039

Chairman Robert Valencia
Pascua Yaqui Tribe of Arizona
7474 S. Camino De Oeste
Tucson, AZ 85746

President Martin Harvier
Salt River Pima-Maricopa Indian Community
10115 E. Osborn Road
Scottsdale, AZ 85256

Chairman Terry Rambler
San Carlos Apache Tribe
P.O. Box 0
San Carlos, AZ 85550

President Arthur Blazer
Mescalero Apache Tribe
P.O. Box 227
Mescalero, NM 88340

Chairwoman Gwendena Lee-Gatewood
White Mountain Apache Tribe
P.O. Box 700
Whiteriver, AZ 85941

The letter below will be sent to all recipients on the mailing list.



Date: 12/20/2019

Chairman Robert Miguel
Ak Chin Indian Community
42507 West Peters & Nail Road
Maricopa , AZ 85138

Subject: Proposed Construction and Operation of U.S. Customs and Border Protection Facilities at Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona

Dear Chairman Miguel:

In accordance with Section 106 of the National Historic Preservation Act and its implementing Regulations, 36 CFR Part 800, U.S. Customs and Border Protection (CBP) would like to consult with your tribe regarding our proposed action. We welcome your comments on this undertaking and look forward to hearing from you.

CBP proposes to construct, operate, and maintain a joint permanent air operation facility at Libby Army Airfield (LAAF), Fort Huachuca, Cochise County, Arizona (Attachment A, Figure 1). CBP has previously completed a Draft Supplemental Environmental Assessment (SEA) and Final Environmental Assessment (EA) to evaluate various potential parcels near LAAF for construction of a permanent facility. CBP completed a Draft SEA in 2010; however, prior to completion, the Army requested CBP consider a different location. Accordingly, CBP considered a different parcel that was also located on the air field, and in 2016 a Final EA was completed for that location. Most recently, however, the Army and CBP have a desire to construct the facility at the parcel originally considered as the Proposed Action in the 2010 SEA.

Although the 2010 SEA was never circulated for public review (and a Finding of No Significant Impact [FONSI] was not signed), all of the necessary survey work was completed and Section 106 consultation with the Arizona State Historic Preservation Office and relevant tribes for the proposed parcel was completed. CBP plans to update the Draft SEA (2010) for the proposed CBP Office of Air and Marine facility at LAAF, Fort Huachuca, Arizona.

The project includes the construction of a taxiway (50,300 square feet [SF]), an aircraft ramp including a helipad (129,210 SF), an administration facility (10,000 SF) positioned on a 261,088-SF area, and a parking area with spaces for 100 vehicles (122,143 (Appendix A, Figure 2)). As part of the update to the 2010 Draft SEA, CBP will be including an additional 2.8-acre parking area and an additional 1.2-acre taxiway proposed as part of the new project. CBP recently completed cultural and biological surveys of the additional areas.

Chairman Miguel

Page 2

The proposed parking area is triangular in shape and would involve blading and grading of an already disturbed ground surface. The taxiway would connect an existing taxiway to a proposed ramp and hangar administration building that are covered in the current SEA being prepared for the project.

The Area of Potential Effect (APE) is an approximately 2.8-acre triangular-shaped parcel located north of Brainard Road, and an approximately 1.2-acre rectangular taxiway located between a proposed ramp and an existing Taxiway (see Attachment A, Figure 2).

A Class I Overview of the project area was conducted in support of the proposed action. Existing records and previous research from AZSITE, the Archaeological Records Office at the Arizona State Museum, as well as archival records from Gulf South Research Corporation, EnviroSystems, and Bureau of Land Management, General Land Office were consulted. No previous cultural resources were identified in or adjacent to the APE. An intensive pedestrian survey of the APE identified no cultural resources. Enclosed for your review is a copy of the State Historic Preservation Office Survey Report Summary Form for the proposed project.

Based upon the negative findings within the APE, and in accordance with CFR Part 800.4(d)(1), CBP has determined there will be no effect on cultural resources. CBP recommends that no additional cultural resources investigation be required for the proposed action. CBP has received concurrence from the Arizona State Historic Preservation Office (SHPO-2019-2089(150873)). CBP is also preparing a Supplemental Environmental Assessment for the proposed action. Per DHS Directive 023-1, Environmental Planning, we will provide you with a copy of the official Draft SEA for the Joint Permanent Air Operation Facility.

If you require any additional information, please contact me at (949) 643-6385 or via email at joseph.zidron@cbp.dhs.gov.

Sincerely,



Joseph Zidron
Real Estate and Environmental Branch Chief
Border Patrol & Air and Marine Program Management Office
U.S. Customs and Border Protection

Enclosure

Attachment A
Figures

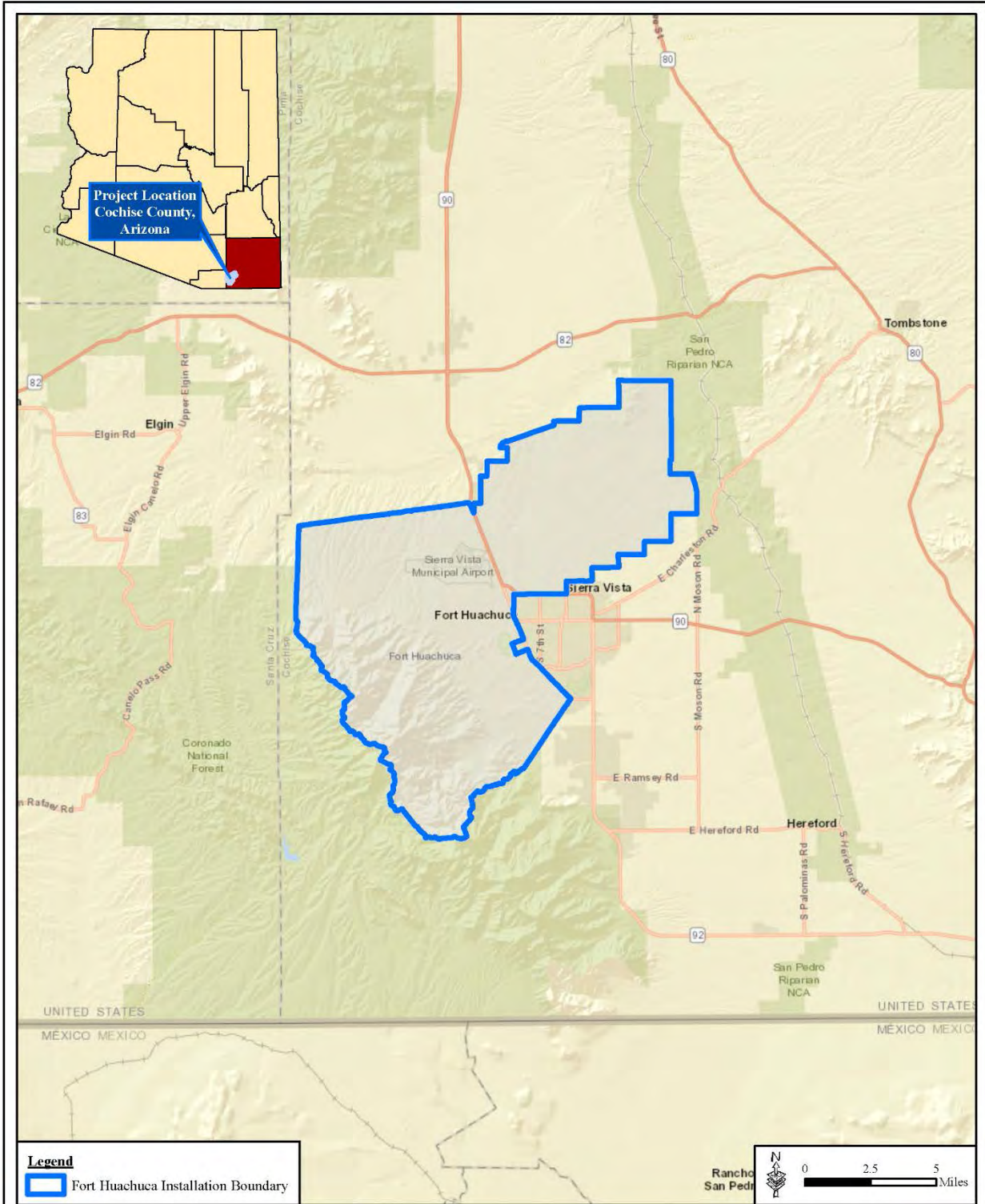


Figure 1-1. Vicinity Map



January 2020

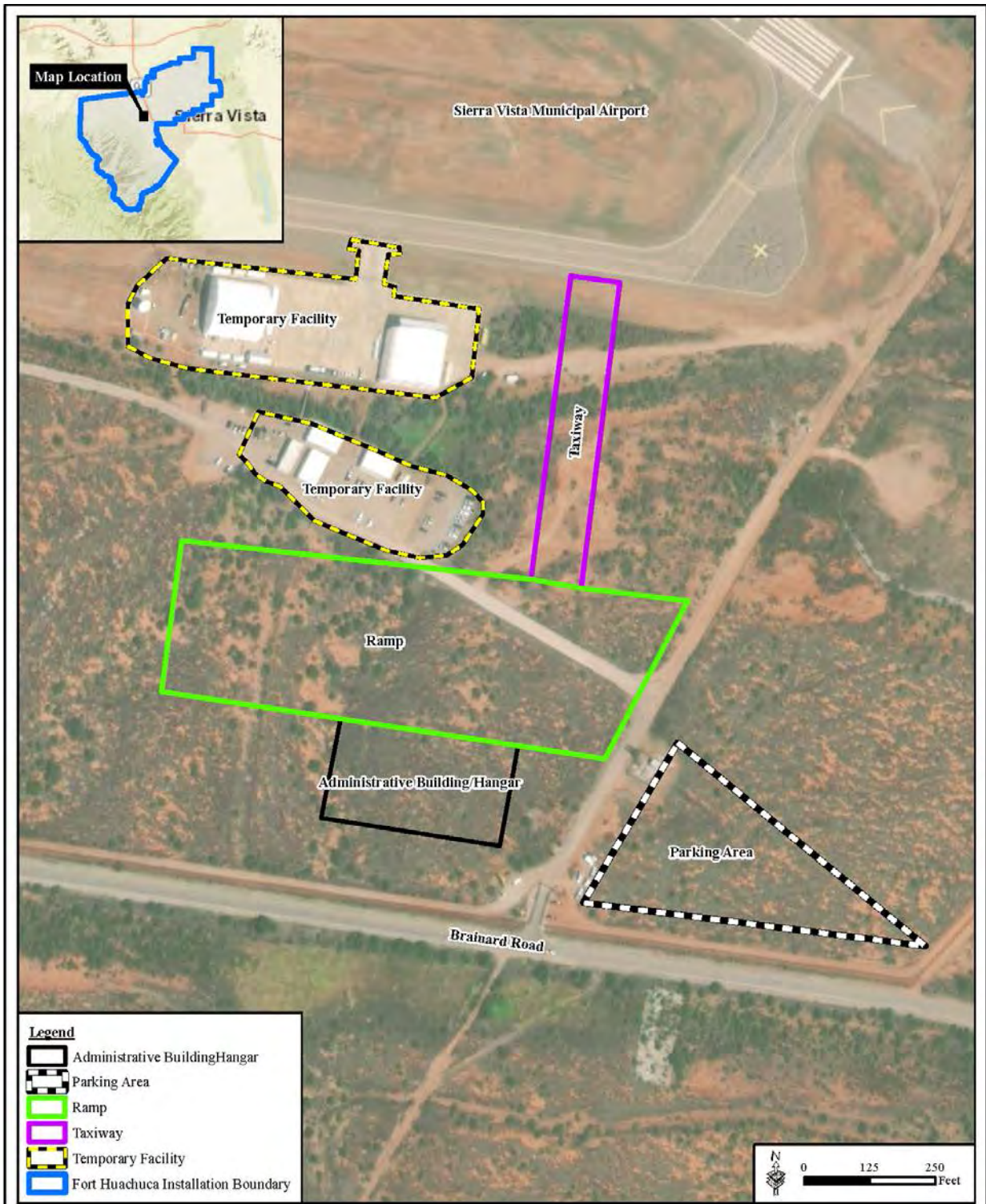


Figure 2-2. Proposed Action Site Configuration Map



October 3, 2019

Ms. Kathryn Leonard, State Historic Preservation Officer
CC: Dr. Jim Cogswell, Compliance Specialist/Archaeologist
Arizona State Parks
1100 W. Washington Street
Phoenix, AZ 85007



RE: *Class III Cultural Resources Inventory of Approximately 4.0 acres for a Proposed Parking Area and Taxiway for U.S. Customs and Border Protection Located within Fort Huachuca, Cochise County, Arizona.*

Dear Ms. Leonard:

U.S. Customs and Border Protection (CBP) proposes to construct, operate, and maintain a joint permanent air operation facility at Libby Army Airfield (LAAF), Fort Huachuca, Cochise County, Arizona (Attachment A, Figure 1). At LAAF, the project includes the construction of a taxiway (approximately 1.2 acre), an aircraft ramp including a helipad (approximately 3.0 acres), an administration facility (approximately 0.23 acre) positioned on an approximately 6.0-acre area, and a parking area with spaces for 100 vehicles (approximately 2.8 acres) (Attachment A, Figure 2). CBP completed a Draft Supplemental Environmental Assessment (SEA) in 2010; however, prior to completion, the Air Force requested CBP consider a different location. Most recently, however, the Air Force and CBP have a desire to construct the facility at the parcel originally considered as the Proposed Action in the 2010 Draft SEA. The previously prepared Draft (SEA) and associate cultural resources survey did not include the 2.8 -acre parking area or 1.2-acre taxiway proposed as part of the new project. The need for the additional parking and a taxiway was identified after the preparation of the Draft SEA. A Class III Cultural Resources Inventory of the proposed parking area and taxiway was conducted in support of Section 106 of the National Historic Preservation Act.

The proposed parking area is triangular in shape and would involve blading and grading of an already disturbed ground surface. The taxiway would connect an existing taxiway to a proposed ramp and hangar administration building that are covered in the current SEA being prepared for the project.

The Area of Potential Effect (APE) is an approximately 2.8-acre triangular-shaped parcel located north of Brainard Road, and an approximately 1.2-acre rectangular taxiway located between a proposed ramp and an existing Taxiway (see Attachment A, Figure 2).

A Class I Overview of the project area was conducted in support of the proposed action. Existing records and previous research from AZSITE, the Archaeological Records Office at the Arizona State Museum, as well as archival records from Gulf South Research Corporation,

Ms. Leonard
Page 2

EnviroSystems, and Bureau of Land Management, General Land Office were consulted. No previous cultural resources were identified in or adjacent to the APE. An intensive pedestrian survey of the APE identified no cultural resources. Therefore, no cultural resources will be adversely affected by the proposed parking area and taxiway construction. CBP recommends that no additional investigation be required for the proposed action.

Sincerely,



Joseph Zidron
Real Estate and Environmental Branch Chief
Border Patrol & Air and Marine Program Management Office
U.S. Customs and Border Protection

Enclosure(s)

CONCUR



Arizona State Historic Preservation Office



January 7, 2020

Mr. Joseph Zidron
Real Estate and Environment Branch Chief
Border Patrol & Air and Marine Program Office
U.S. Customs and Border Protection
Phone: (949) 643-6392
Email: joseph.zidron@cbp.dhs.gov

Dear Mr. Zidron,

- RE: 1. Request for a "copy of the official Draft SEA for the Joint Permanent Air Operations Facility for review and for comment.; and
2. CBP's proposed "joint permanent air operation facility at Libby Army Airfield, Fort Huachuca" cannot be located within the Upper San Pedro Basin without further jeopardizing the San Pedro River and its dependent federally listed endangered species.

The Center for Biological Diversity ("Center") is a non-profit, public interest, conservation organization with more than 1.6 million members and online activists dedicated to the protection of endangered species and wild places and to the fulfillment of the continuing educational goals of our membership and the general public in the process.

The San Pedro River is the last surviving, undammed desert river in the Southwest.¹ In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area ("SPRNCA") within the Sierra Vista Sub-basin "[i]n order to protect the riparian area and the aquatic wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."² The U.S. Congress created

¹ *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1995; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995; "Ribbon of Life: An Agenda for Preserving Transboundary Migratory Bird Habitat on the Upper San Pedro River: Commission For Environmental Cooperation, 1999; *Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981; "In Arizona Desert, a Desert Oasis in Peril," Tom Christensen, New York Times, May 4, 1999; "A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, *National Geographic*, April 2000; "Alternative Futures for Landscapes in the Upper San Pedro River Basin of Arizona and Sonora," Carl Steinitz, Robert Anderson, Hector Arias, Scott Bassett, Michael Flaxman, Thomas George, Thomas Maddock III, David Moutar, Richard Peiser and Allan Shearer, USDA Forest Service Gen. Tech. Rep. PSW-GTR-191, 2005; "We pump too much water out of the ground—and that's killing our rivers," Alejandro Borunda, *National Geographic*, October 2, 2019.

² *Arizona-Idaho Conservation Act*, 16 U.S.C. § 460(c)(6) (November 18, 1988).

SPRNCA in recognition of the fact that the San Pedro River is one of Arizona's, the Nation's, and the World's environmental crown jewels.³

Please see the attached December 3, 2019, Notice of Intent to Sue ("NOI"). The facts documented in our NOI reflecting the current deteriorating condition of the San Pedro River and its source aquifer are directly applicable to your proposal. Please include this NOI in your administrative file for your proposed facility at Fort Huachuca.

Obviously, you are not aware of the facts documented in our NOI or you would not be proposing to construct, operate, and maintain your facility within the Upper San Pedro Basin.

Please forward a copy of your 2010 Draft Supplemental Environmental Assessment ("SEA") and your Final Environmental Assessment ("EA") for your proposed facility at Fort Huachuca to us ASAP. Even better, since you must be aware of the controversial nature of your proposal and the amount of interest that will now occur as this proposal has become public, please forward electronic .pdf copies of the SEA and EA, or please provide a URL for ease of access.

Thank you in advance for your prompt reply. Please email all materials to Dr. Robin Silver, Center for Biological Diversity, email: rsilver@biologicaldiversity.org, or send them to Dr. Robin Silver, PO Box 1178, Flagstaff, AZ 86002. Please call me at (602) 799-3275 if you have any further questions about this request. Again, we prefer to receive the requested document(s) in searchable electronic form, and in batches as the responsive documents are compiled.

Sincerely,



Robin Silver, M.D.
Co-Founder and Board Member

³ "Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem, Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values*, BLM, 1987; "U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xxx(a), U.S. Congress, November 18, 1988; *San Pedro Riparian Area*," Sam Negri, Arizona Highways Magazine, April 1989; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993; "Arizona Riparian Protection Program Legislative Report," ADWR, July 1994; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995; "Rio San Pedro, One of the last great places," Robert C. Dyer, Arizona Highways Magazine, May 1996; "The Ageless Waters of the San Pedro River," Roseann Beggy Hanson, Arizona Highways Magazine, November 1998; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, National Geographic, April 2000; "If National Geographic can see the San Pedro as a jewel, can't those of us living here?" Editorial, Sierra Vista Herald, April 25, 2000; ; "A treasure at risk, Bill threatens San Pedro River," Editorial, Arizona Republic, May 23, 2002; "Siphoning the San Pedro," Editorial, Arizona Daily Star, May 26, 2002; "Last Great Places, San Pedro River, Miracle in the Desert," The Nature Conservancy Website, August 20, 2002; "Riparian rip-off, A silly rider has popped up in Congress, again – and should die again," Editorial, Arizona Republic, May 21, 2003; and "A river to save, the fate of the San Pedro will rest on McCain's shoulders," Editorial, Arizona Republic, September 2, 2003.



January 13, 2020

Mr. Joseph Zidron
Real Estate and Environmental Branch Chief
Border Patrol & Air and Marine Program Management Office
U.S. Customs and Border Protection
U.S. Department of Homeland Security
Washington, DC 20229

Re: Proposed Construction and Operation of U.S. Customs and Border Protection Facilities at Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona

Dear Mr. Zidron:

Thank you for notifying the Arizona Game and Fish Department (Department) of the proposed construction, operation, and maintenance of a joint permanent air operation facility at Libby Army Airfield on Fort Huachuca in Cochise County, Arizona. The Department understands your agency is gathering data and input from a variety of sources to update the Draft Supplemental Environmental Assessment (SEA) prepared in 2010. As described in your letter, the new facilities would include two new taxiways, an aircraft ramp including a helipad, an administrative facility, and parking areas.

The Department has worked with Fort Huachuca on joint wildlife projects and Integrated Natural Resource Management Plans through the Sikes Act to further the Department's mission to conserve Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission (Commission), has jurisdictional authority and public trust responsibilities for the management of state fish and wildlife resources. The Department appreciates the opportunity to provide input on this project and offers the following comments based on our agency's statutory authorities, public trust responsibilities, and special expertise related to wildlife resources and recreation.

The Department has generated an environmental review report for you using the Arizona Online Environmental Review Tool (<https://azhgs2.eart.com/>). This report identifies documented occurrences of special status species occurring within three miles of the project vicinity, as well as Species of Greatest Conservation Need (SGCN) predicted within the project vicinity. Because the project is located adjacent to the existing airfield and in the vicinity of Fort Huachuca and Sierra Vista development, there is a low likelihood of negative impacts to special status species or SGCN.

The Department conducts aerial wildlife surveys originating from the Sierra Vista Municipal Airport immediately adjacent to Libby Army Airfield and do not anticipate the proposed action would conflict with our ability to conduct these surveys or unpair the proposed construction activities. The

azgfd.gov | 520.628.5378

TUCSON OFFICE: 555 N. GREASEWOOD ROAD, TUCSON AZ 85745

GOVERNOR: DOUGLAS A. DUCY | COMMISSIONERS: CHAIRMAN: ERIC S. BRANKS, TUCSON | KURT R. DAVIS, PHOENIX

LAURIE S. ORR, TAVALEGUITO | GAMES E. GOVCHINGVI, PAYSON | JAMES E. ZIEGLER, FT. JOHN | DIRECTOR: TY E. STAY | DEPUTY DIRECTOR: TOM R. FINLEY

Mr. Joseph Zidron
January 13, 2020
Page 2

Department requests advance notification of commencement of construction activities to ensure any necessary schedule adjustments are made. Surveys are conducted in January/February and in July.

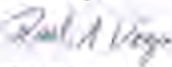
Your letter states that biological surveys were recently completed, however the timing and breadth of those surveys was not indicated. The Department recommends biological surveys for the project area, particularly for breeding birds and desert box turtles. The trees and/or vegetation within the project area may provide nesting opportunities for avian species regulated under the Migratory Bird Treaty Act and under State law (ARS 17-236). A qualified biologist should conduct a survey for nesting birds within the project area prior to removal or trimming of trees/vegetation during the breeding season. Breeding season for birds is generally May through late August, depending on the species and habitat.

The desert box turtle occurs in the southeastern corner of Arizona, mainly inhabiting semidesert grassland. It is the Department's understanding that a chain link fence surrounds the perimeter of the Libby Army Airfield. Chain link fencing that extends to the ground surface should be adequate to exclude adult box turtles, however juvenile turtles can be small enough to fit through the openings in such fences. If biological surveys are conducted during periods of expected box turtle activity (primarily early mornings and late afternoons from onset of summer monsoons into the fall), biologists should be on the lookout for turtles. Any adult turtles discovered at any time within the fence perimeter should be carefully relocated outside the fence, as near to the discovery location as possible.

The Department is the repository for the State's Heritage Data Management System (HDMS). The HDMS is part of a global network of more than 80 Natural Heritage Programs and Conservation Data Centres. HDMS information is available so Arizonans can make prudent decisions weighing future development, economic growth, and environmental integrity. Information included in the HDMS comes from published and unpublished reports, data collected by cooperating agencies, museum and herbarium collections, the scientific and academic communities, and many other sources. The Department requests Customs and Border Protection's assistance in gathering data on Arizona's tracked species whenever feasible. More information regarding Arizona's Natural Heritage Program and HDMS is available at <https://www.azgfd.com/wildlife/heritagefind/>. Data can be submitted by filling out an Element Occurrence Card and mailing to the Department's HDMS program (card and address provided on webpage) or through our iNaturalist application or website at <https://www.inaturalist.org/projects/hdms-point-observation-database>.

The Department anticipates involvement in review of the Draft SEA when available. If you have any questions regarding this letter or request additional information, please contact Kristin Terpening at 520-388-4447 or kterpening@azgfd.com.

Sincerely,



Raul Vega
Regional Supervisor, Tucson

AGFD # M19-12302016



OFFICE OF THE MAYOR

December 31, 2019

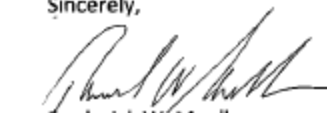
Dear Mr. Zidron,

Thank you for including the City of Sierra Vista in the development process of the Supplemental Environmental Assessment (SEA) for the proposed U.S. Customs and Border Protection (CBP) facility at Libby Army Airfield. We are fully supportive of your Joint Permanent Air Operations Facility, as long as it has been approved by Fort Huachuca. We would have appreciated a more in-depth consideration of the available land at the Sierra Vista Municipal Airport to support your air mission.

The CBP has been a long-term partner with our City, we look forward to reviewing the final draft of the SEA and ultimately the construction of your permanent facility. If we can be of any assistance in reinforcing the importance of CBP's project or prioritization with Congress, please let us know. We have a very active relationship with the Arizona Congressional Delegation and would be happy to bring the Air Operations facility to their attention. The City of Sierra Vista is extremely supportive of CBP's mission and recognizes the positive impact on public safety and our local economy.

If you need any further assistance please feel free to contact my office or City of Sierra Vista's Economic Development Manager, Tony Boone at (520)439-2184 or tony.boone@sierravistaaz.gov.

Sincerely,



Frederick W. Mueller
Mayor

CITY OF SIERRA VISTA
1011 North Coronado Drive
Sierra Vista AZ 85635
520-458-3315
www.SierraVistaAZ.gov





December 3, 2019

Certified Mail #
Dr. Mark Espers
Secretary of Defense
U.S. Department of Defense
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Washington, DC 20301-1000

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Ryan D. McCarthy
Secretary of the Army
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Certified Mail #
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Commanding General
U.S. Army Intelligence Center at Fort Huachuca
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Amy Lueders
Regional Director, Southwest Region
U.S. Fish and Wildlife Service
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RDLueders@fws.gov

Certified Mail #
Supervisor Jeff Humphrey
Arizona Ecological Services Field Office
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
jeff_humphrey@fws.gov

RE: Sixty-Day Notice of Intent to Sue Fort Huachuca and U.S. Fish and Wildlife Service for Endangered Species Act Violations jeopardizing the San Pedro River and the endangered species that represent and depend on the River.

Dear Dr. Espers, Mr. Bernhardt, Mr. McCarthy, Maj. Gen. Potter, Col. Rambo, Ms. Everson, Ms. Lueders, and Mr. Humphrey,

The U.S. Secretary of Defense, Secretary of the Army, Fort Huachuca Commanding General and Garrison Commander, the U.S. Secretary of the Interior, U.S. Fish and Wildlife Service Director, Region 2 Director, and Arizona Ecological Services Director are hereby notified that the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to file suit, pursuant to the citizen suit provision of the Endangered Species Act ("ESA"), 16 U.S.C. § 1540(g), and the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 701-706, to compel the reinitiation of ESA Section 7 consultation¹ to remedy Fort Huachuca activities jeopardizing the San Pedro River and the endangered species that represent and depend on the San Pedro.

EXECUTIVE SUMMARY

The San Pedro River is the last surviving, undammed desert river in the Southwest.² In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area ("SPRNCA") within the Sierra Vista Sub-basin "[i]n order to protect the riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."³ The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River is one of Arizona's, the Nation's, and the World's environmental crown jewels.⁴

¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

² *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; *"Ribbon of Life. An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental Cooperation, 1999.; Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981.; *"In Arizona Desert, a Desert Oasis in Peril."* Jon Christensen, New York Times, May 4, 1999.; *"A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, National Geographic*, April 2000.; *"Alternative Futures for Landscapes in the Upper San Pedro River Basin of Arizona and Sonora*, Carl Steinitz, Robert Anderson, Hector Arias, Scott Bassett, Michael Flaxman, Tomas Goode, Thomas Maddock III, David Moutat, Righard Peiser and Allan Shearer, USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005.; *"We pump too much water out of the ground—and that's killing our rivers,* Alejandra Borundo, National Geographic, October 2, 2019.

³ *Arizona-Idaho Conservation Act*, 16 U.S.C. § 460xx(a), November 18, 1988.

⁴ *"Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem*, Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978.; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values*, BLM, 1987.; *"U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report*, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988.; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988.; *San Pedro Riparian Area*," Sam Negri, Arizona Highways Magazine, April 1989.; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.; *"Arizona Riparian Protection Program Legislative Report*," ADWR, July 1994.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; *"Rio San Pedro, One of the last great places,"* Robert C. Dyer, Arizona Highways Magazine, May 1996.; *"The Ageless Waters of the San Pedro River,"* Roseann Beggy Hanson, Arizona Highways Magazine, November 1998.; *Ribbon of Life. An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental Cooperation, 1999.; "In Arizona Desert, a Desert Oasis in Peril,"* Jon Christensen, New York Times, May 4, 1999.; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, National Geographic, April 2000.; *"If National Geographic can see the San Pedro as a jewel, can't those of us living here?"* Editorial, Sierra Vista Herald, April 25, 2000.; ; *"A treasure at risk, Bill threatens San Pedro River,"* Editorial, Arizona Republic, May 23, 2002.; *"Siphoning the San Pedro,"* Editorial, Arizona Daily Star, May 26, 2002.; *"Last Great Places, San Pedro River, Miracle in the Desert*, The Nature Conservancy Website,

The San Pedro River in summer:



© Robin Silver

August 20, 2002.; *"Riparian rip-off. A silly rider has popped up in Congress, again – and should die again,"* Editorial, Arizona Republic, May 21, 2003.; and *"A river to save, the fate of the San Pedro will rest on McCain's shoulders,"* Editorial, Arizona Republic, September 2, 2003.

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year, will cease within the next century.⁵ San Pedro River base flow is disappearing because the Fort Huachuca/Sierra Vista area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.⁶ Department of Defense/Fort Huachuca-attributable unmitigated, deficit groundwater pumping is a major contributor to this problem.⁷

We are compelled, at this time, to seek judicial assistance in saving the San Pedro River and its representative and dependent endangered species for three major reasons:

1. We have newly secured a report previously covered up by Fort Huachuca, titled "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared by Fort Huachuca contractor, GeoSystems Analysis, Inc., in 2010.⁸ The report finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003,⁹ and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."¹⁰

Fort Huachuca failed to share this report with the U.S. Fish and Wildlife Service ("FWS")¹¹ during the last evaluation in 2014 of Fort Huachuca's effects on the San Pedro River for preparation of the March 31, 2014, Endangered Species Act ("ESA") Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014. ("BiOp").¹²

⁵ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungler, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Enstoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona. Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

⁶ *Ibid.*

⁷ BiOp at 80, 85, 154, and 169.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000, Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019.

⁸ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

⁹ *Ibid.*, pages 3-10, 11, 12 and 13.

¹⁰ *Ibid.*, page 3-11.

¹¹ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

¹² U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

The March 31, 2014, BiOp authorizes Fort Huachuca activities. If the Base had not covered up the GeoSystems (2010) report conclusions, Fort Huachuca activities would not have been cleared to the current levels.

2. The City of Sierra Vista and Cochise County have failed to keep their promise to "balance the area's water deficit by 2011,"¹³ while the State of Arizona and the Arizona Department of Water Resources ("ADWR") have approved 431 new wells since December 31, 2011,¹⁴ when data gathering ended for the BiOp.¹⁵

Because of the failure of Sierra Vista, Cochise County, and ADWR to keep their promise and to help Fort Huachuca mitigate the approximate 40% of the off-post groundwater pumping attributable to the Base,¹⁶ Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area will be increasing by 61.9% since the BiOp from 1,453 acre-feet per year¹⁷ to approximately 2,325.2 acre-feet per year.¹⁸; and,

3. New hydrological modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdown) at year 2100 show that "[d]rawdowns exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."¹⁹ These new findings are from Integrated Hydro Systems from Boulder, Colorado.

Relating to the Army's covered up GeoSystems (2010) report, Integrated Hydro (2019) also concludes that,

"It should be noted that this evaluation [by Integrated Hydro (2019)] does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this [Integrated Hydro (2019)] study, the total Fort-Attributable pumping impacts on the San Pedro

¹³ "USPP's resolution called a 'bold step.' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

¹⁴ Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcsis.com/> on March 17, 2017.

¹⁵ BiOp at 3.

¹⁶ BiOp at 28, 153, 154 and 156.

¹⁷ BiOp at 80, 85, 154, and 169.

¹⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcsis.com/> on March 17, 2017.

¹⁹ Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019, page 13.

River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."²⁰

Integrated Hydro (2019) summarizes their new modeling of simulated Fort-attributable groundwater levels (or drawdown) at year 2100 in the following illustration of the simulated reduction in streamflow from Fort-attributable groundwater pumping:



Figure 16. Change in Winter Streamflow (cfs) at Year 2100 due to Fort-Attributable Groundwater Pumping and Recharge (Southern SPRNCA Area). Positive values indicate streamflow decreases, and Negative values indicate streamflow increases. 24

In addition to the above three major findings that have compelled us to initiate these legal proceedings, we have identified multiple examples of clear violations of law by Fort Huachuca and FWS.

The Endangered Species Act ("ESA") requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize the survival and the recovery of federally protected endangered species and their essential habitat.²¹ The consultation must be based on the best available scientific information.²² If, after a consultation, significant new information becomes available, a new consultation must take place.²³ In addition, the Administrative

²⁰ *Ibid.*, pages 4-5.

²¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

²² 16 U.S.C. § 1536(a)(2).

²³ 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16; 50 C.F.R. § 402.14(g).

Procedure Act requires that federal decisions are not "arbitrary, capricious, or an abuse of discretion."²⁴

All federal activities at Fort Huachuca are currently authorized by the March 31, 2014, FWS Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014 ("BiOp").²⁵ The BiOp is based on information provided to FWS by Fort Huachuca in the November 13, 2013, Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca ("PBA").²⁶ Species representing and dependent on the San Pedro River evaluated in the BiOp include Huachuca Water Umbel, Jaguar, Chiricahua Leopard Frog, Mexican Spotted Owl, Lesser Long-nosed Bat, Ocelot, and Sonora Tiger Salamander.

The BiOp currently authorizing Fort Huachuca activities is no longer valid for three reasons: (1) the BiOp failed to use the best available scientific information and arrives at its conclusions in an arbitrary and capricious manner, (2) the BiOp has not been reexamined as required with subsequent new San Pedro River related listings, and (3) the BiOp has not been reexamined as required as new information has become known.

Based on a failure to use the best available scientific information, the BiOp wrongly concludes that the Fort's operations will not jeopardize the continued existence and recovery of federally protected species representing and dependent upon the San Pedro River. The BiOp arrives at its erroneous non-jeopardy conclusion owing to the facts that:

1. The BiOp inappropriately relies upon speculative water-savings credits for "avoided future use" that fail to retire active water uses.²⁷
2. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel that had already ceased pumping in 2004,²⁸ and had no chance of being restarted because 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years would be captured water that would otherwise supply surface flow to the San Pedro.²⁹
3. The BiOp inappropriately relies upon an arbitrary limitation of the BiOp's analysis time to ten years.;

²⁴ 5 USC §706(2)(A).

²⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

²⁶ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

²⁷ Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow, to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble, RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

²⁸ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, R.G. Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; *Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona - 2012 Report to Congress*, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 - Water-budget, U.S. Geological Survey, 2014, Table 4, page 8.

²⁹ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leske, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47.

4. The BiOp fails to include in its hydrological modeling, the fact that the effects of Fort Huachuca's pre-BiOp on post groundwater pumping were already harming the River significantly by 2003,³⁰ and that even if all groundwater pumping were stopped as of 1988, "the cone of depression ... in the Sierra Vista area would not recover completely in 100 years."³¹ and,
5. The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow, in spite of the fact that FWS' concurrence contradicts its own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,³² Pupfish,³³ Spikedace³⁴ and Loach Minnow.³⁵

These errors, (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [16 U.S.C. § 1536(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Since FWS' March 31, 2014, BiOp release, two more species representative of and dependent upon the San Pedro River, Yellow-billed Cuckoo³⁶ and Northern Mexican Gartersnake,³⁷ have been added to the federal list of endangered species. When new species are added to the federal list and are affected by federal actions such as Fort Huachuca's groundwater pumping, the law requires that Fort Huachuca consults with FWS to ensure that the Base's activities will not jeopardize survival and recovery of these species.³⁸ Fort Huachuca has not consulted with FWS as required in spite of the fact that the Base's activities are jeopardizing the survival and recovery of these species. Fort Huachuca's failure to consult with FWS to prevent

³⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, prepared by GeoSystems Analysis, Inc. November 2010, page 3-11.

³¹ U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix., pages 14 & 15.

³² Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax traillii eximius*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

³³ Desert Pupfish (*Cyprinodon macularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

³⁴ Spikedace (*Medea fulgida*) Recovery Plan, USFWS, September 1991.

³⁵ Loach Minnow (*Taroga cobitis*) Recovery Plan, USFWS, September 1991.

³⁶ Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

³⁷ Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

³⁸ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

jeopardizing Yellow-billed Cuckoo and Northern Mexican Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Since release of the March 31, 2014, BiOp, new information is now available that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated;³⁹ (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release; and (4) that Fort Huachuca covered up and failed to provide FWS the report, GeoSystems (2010) for BiOp preparation.

Specifically, since BiOp release, new information includes,

1. On-post stormwater recharge has provided 60% less recharge for the last four years than anticipated in the BiOp.;⁴⁰
2. On-post effluent recharge has provided 47% less recharge for the last five years than anticipated in the BiOp.;⁴¹
3. Off-post, the Palominas stormwater recharge project has provided 90% less recharge than anticipated in the BiOp.;⁴²
4. Arizona has become both hotter and drier.⁴³ Climate models project that precipitation and soil moisture in the Southwest will continue to decrease.⁴⁴ The recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and "Incidental Recharge" (BiOp at 168) will be diminished even further in the future.;⁴⁵

³⁹ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

⁴⁰ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

⁴¹ *Ibid.*

⁴² Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

⁴³ National Oceanic and Atmospheric Administration National Centers for Environmental Information, City Time Series, published October 2019, retrieved on October 22, 2019 from <http://www.ncdc.noaa.gov/cag/>.

⁴⁴ Easterling, D.R., K.E. Kumkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (p. 217); Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kumkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN (pp. 231, 236).

⁴⁵ Vose, R.S., D.R. Easterling, K.E. Kumkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kumkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose,

5. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area⁴⁶ will be increasing by 61.9 % from 1,453 acre-feet per year⁴⁷ to approximately 2,325.2 acre-feet per year.⁴⁸; and
6. Fort Huachuca covered up and failed to provide to FWS for BiOp production,⁴⁹ GeoSystems (2010)⁵⁰ which finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003;⁵¹ and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."⁵²

This new information reveals effects of Fort Huachuca's actions that are affecting the San Pedro River and its dependent endangered species and Critical Habitat to an extent not previously considered. A new consultation and BiOp addressing this new information are now required by law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

In 60 days from the date of this Notice, in accordance with the ESA citizen suit provision, 16 U.S.C. § 1540(g), if Fort Huachuca and FWS fail to correct the multiple violations of law listed above, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to seek judicial remedy.

FACTUAL BACKGROUND

The San Pedro River

The San Pedro River is the last surviving, undammed desert river in the Southwest.⁵³ In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area

D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230. doi: 10.7930/J0H993CC; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN; Seager, R., T. Mingfang, L. Quilua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: 482-486.

⁴⁶ Sierra Vista Subbasin

⁴⁷ BiOp at 80, 85, 154, and 169.

⁴⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

⁴⁹ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

⁵⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

⁵¹ *Ibid.*, pages 3-10, 11, 12 and 13.

⁵² *Ibid.*, page 3-11.

⁵³ *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; *"Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental*

("SPRNCAs") within the Sierra Vista Sub-basin.⁵⁴ The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River, specifically within the Sierra Vista Sub-basin, is one of Arizona's, the Nation's, and the World's environmental crown jewels.⁵⁵ In 1993, Life Magazine recognized the San Pedro River as one of America's Last Great Places.⁵⁶

In 1999, the North American Free Trade Agreement's Commission for Environmental Cooperation observed,

"Every year, millions of songbirds migrate from their wintering grounds in Mexico and Central America to their summer breeding habitats in Canada and the northern United States. In order to successfully cross the desert landscapes of northern Mexico and the southwestern United States, migrating songbirds congregate and travel along a small number of north-south oriented corridors where they are able to find shelter, food, and water. Especially, they travel along the rivers: the Rio Grande/Rio Bravo, the Colorado, the Santa Cruz, and the San Pedro.

Over the last century, we have lost much of the riparian habitat upon which many migratory bird species depend. . . .

Unlike the other rivers listed above [Rio Grande/Rio Bravo, Colorado, and Santa Cruz], the overall health and quality of the upper San Pedro River and its riparian habitat have not declined significantly over the last century. On both sides of the border, the San Pedro River continues to support riparian habitat of exceptional quality and increasing scarcity elsewhere, offering an alternative route for species whose previous migratory pathways have been lost or degraded to the point where they can no longer sustain large populations. Indeed, there is mounting evidence suggesting that more birds use the upper San Pedro now than ever before. However,

Cooperation, 1999; *Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999; "A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, National Geographic, April 2000; "We pump too much water out of the ground—and that's killing our rivers," Alejandra Borundo, National Geographic, October 2, 2019.

⁵⁴ *Arizona-Idaho Conservation Act*, 16 U.S.C. § 460xx(a), November 18, 1988.

⁵⁵ "Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem, Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values*, BLM, 1987; "U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988; *San Pedro Riparian Area*," Sam Negri, Arizona Highways Magazine, April 1989; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993; "Arizona Riparian Protection Program Legislative Report," ADWR, July 1994; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995; "Rio San Pedro, One of the last great places," Robert C. Dyer, Arizona Highways Magazine, May 1996; "The Ageless Waters of the San Pedro River," Roseann Beggy Hanson, Arizona Highways Magazine, November 1998; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, National Geographic, April 2000; "If National Geographic can see the San Pedro as a jewel, can't those of us living here?" Editorial, Sierra Vista Herald, April 25, 2000; ; "A treasure at risk, Bill threatens San Pedro River," Editorial, Arizona Republic, May 23, 2002; "Siphoning the San Pedro," Editorial, Arizona Daily Star, May 26, 2002; "Last Great Places, San Pedro River, Miracle in the Desert," The Nature Conservancy Website, August 20, 2002; "Riparian rip-off, A silly rider has popped up in Congress, again – and should die again," Editorial, Arizona Republic, May 21, 2003; and "A river to save, the fate of the San Pedro will rest on McCain's shoulders," Editorial, Arizona Republic, September 2, 2003.

⁵⁶ *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.

there has also been growing concern that this valued transboundary ecosystem, and the hydrological system that supports it, may be on an unsustainable course.

As in many regions along the Mexican and US border, the upper San Pedro valley faces one of the most pressing challenges of the next century - water scarcity.⁵⁷

In the Upper San Pedro Basin, groundwater from the deep local aquifer seeps from the banks of the San Pedro River to provide base flow, or surface flow in the River during the driest times of the year.⁵⁸ Wells within the sub-basin intercept this groundwater and aquifer water that would otherwise surface or day-light as San Pedro River surface flow. There is no difference between groundwater and surface water in the Sierra Vista Sub-basin. The water is intimately connected. It is the same water.⁵⁹

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year will cease within the next century. San Pedro River base flow will cease within the next century because the area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.⁶⁰

In June 2011, because of the uncontrolled, excessive, local groundwater pumping, hydrologist Dr. Laurel Lacher's modeling concluded "much" of the aquifer-sourced San Pedro River base flow, or stream flow during the dry times of the year "will cease...over the next century." Dr. Lacher's exact quotation (2011) states:

⁵⁷ Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat on the Upper San Pedro River, North American Free Trade Agreement Commission for Environmental Cooperation, 1999.

⁵⁸ Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area, Arizona, Arizona Water Commission, March 18, 1974; Correspondence, from: Stephen G. Thompson, Director, Fort Huachuca Directorate of Engineering and Housing; to: Dr. Walter S. Patton, Cochise College President, RE: Response to your request for addressing the water issue in the Upper San Pedro River area.; March 30, 1994.; SIERRA VISTA SUBWATERSHED HYDROLOGY PRIMER, produced for the City of Sierra Vista, Bella Vista Water Company, Inc. and Pueblo Del Sol Water Company, ASL Hydrologic & Environmental Services in conjunction with R. Allan Freeze Engineering, Inc., December 1994.; Upper San Pedro River case study, Arizona Riparian Protection Program, Legislative Report, Arizona Department of Water Resources, Pages 147-208, July 1994.; A Groundwater Flow Model of the Sierra Vista Subwatershed of the Upper San Pedro Basin, Southeastern Arizona, Steven W. Correll, Frank Corkhill, Daryl Lovvik, and Frank Putman, Arizona Department of Water Resources Hydrology Division, Modeling Report No. 10, Phoenix, Arizona December 1996.; Hydrogeologic Investigations of the Sierra Vista Subwatershed of the Upper San Pedro Basin, Cochise County, Southeast Arizona, D.R. Pool and Alissa L. Coes, Water-Resources Investigations Report 99-4197, USGS, 1999.; Order, Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al., CIV99-203 TUC ACM, 198 F. Supp. 2d 1139, April 8, 2002.; Ground-water flow model of the Sierra Vista Subwatershed and Sonoran portions of the Upper San Pedro Basin, southeastern Arizona, United States, and northern Sonora, Mexico, D.R. Pool and J.E. Dickinson, U.S. Geological Survey Scientific Investigations Report 2006-5228, 48 p.; Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results, Laurel J. Lacher, PhD, R.G. Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Order, Center for Biological Diversity et al. v. Kenneth L. Salazar, et al., CV 07-484-TUC-AWT, 2011 WL 2160254 (D.Ariz.); May 28, 2011. Correspondence, from: Julie A. Decker, Deputy State Director, Bureau of Land Management Arizona Resources Division; to: Mr. Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources; Subject: Designation of Adequate Water Supply (File No. 40-700705, Pueblo Del Sol Water Company) and Water Report (File No. 53-700704, The Oaks); March 16, 2012.

⁵⁹ Ibid

⁶⁰ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungler, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

“In general, the simulations predict that, in the absence of any major water use changes in the basin, much of the San Pedro and Babocomari rivers will cease to have perennial baseflow over the next century due to the widespread impacts of projected groundwater pumping.”⁶¹

Dr. Lacher has since updated this 2011 study and in February 2018, Lacher’s conclusion is essentially the same:

“The capture analysis in this study demonstrates that simulated natural recharge and existing MAR [Managed Aquifer Recharge] are insufficient to meet the net pumping demand in the model area, even at the reduced pumping rates in this study compared with the 2011 model update by Lacher.”⁶²

In February 2017, the U.S. Geological Survey [“USGS” or “Gungle et al. (2017)"] similarly notes:

“Nonetheless, it should be obvious that a subwatershed perennially in deficit will likely never see an increase in natural groundwater discharge to the river... Even if groundwater pumping were to stop today and the groundwater budget balance was positive for decades to come, the effects of pumping over the past century would eventually capture surface flow from the river (Leake and others, 2005; Barlow and Leake, 2012). According to recent modeling, some capture of surface flow from the San Pedro River is already occurring (Lacher and others, 2014) ...

Base flow has been declining at the Palominas, Charleston, Tombstone, and Lower Babocomari gaging stations over the entire period of record... groundwater flow modeling, which can isolate the effects of groundwater pumping, has shown that water levels in the subwatershed have declined since 1902, reducing the groundwater gradients that influence groundwater flow toward the river by as much as 17 percent (Lacher and others, 2014). Water-level declines also reduce the total volume of water that flows to the river...

The expanding cone of depression (as expressed by the declining horizontal hydraulic gradients and decreasing water levels on Fort Huachuca) should be of interest to water managers and to those with an interest in the SPRNCA. Even if pumping were immediately reduced or stopped, the cone would continue to propagate for decades or more (Leake and others, 2005; Barlow and Leake, 2012). Without significant mitigation measures, it is likely too late already to prevent declining water levels from reaching the San Pedro River riparian area from Charleston to Tombstone.”⁶³

Because of the San Pedro River’s rarity and because of the groundwater pumping threat that it faces, many endangered species who represent the River’s health depend on the San Pedro

⁶¹ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.

⁶² Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

⁶³ Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg. 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona. Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

for survival and for recovery. These endangered species include Southwestern Willow Flycatcher,⁶⁴ the Western Yellow-billed Cuckoo,⁶⁵ the Northern Mexican Gartersnake,⁶⁶ Ocelot, Jaguar, Loach Minnow,⁶⁷ Spikedace⁶⁸ and Huachuca Water Umbel.⁶⁹

FACTUAL BACKGROUND

The History of Fort Huachuca's water problem and the Impact of the Base's Groundwater Pumping

Fort Huachuca's water problem and its vulnerability to "no control...over the drilling of new wells in the privately owned area" off post have been known to the U.S. Army for 50 years.⁷⁰ Today, Fort Huachuca's water problem is reaching the point of no return.⁷¹

A 1966 report by the U.S. Geological Survey and Fort Huachuca, "Water Resources of Fort Huachuca Military Reservation," says,

"A second well field, if developed in the North Gate-Libby Field area, would partly accomplish the same result [decrease the draft on the ground-water reservoir] by decreasing the heavily concentrated draft on the ground-water reservoir of the Fort Huachuca well field, and by utilizing groundwater that now moves unused

⁶⁴ Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii eximius*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

⁶⁵ "San Pedro Riparian National Conservation Area... Perhaps 30 percent of the western U.S. population Yellow-billed Cuckoos breed here" from Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine December 2002, Vol. 104, No. 5.; At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River from, Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.; SPRNCA has the largest population of Cuckoos in the western United States. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*): Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

⁶⁶ Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

⁶⁷ Loach Minnow (*Taroga cobitis*) Recovery Plan, USFWS, September 1991.

⁶⁸ Spikedace (*Medea fulgida*) Recovery Plan, USFWS, September 1991.

⁶⁹ Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, Final Rule, U.S. Fish and Wildlife Service (USFWS), Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

⁷⁰ "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S. Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.; "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970

⁷¹ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungie, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg. 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019.

northeastward to the San Pedro River. ... In the East Gate-Fort Huachuca-Sierra Vista area, the cone of depression caused by pumping is readily apparent."⁷²

The additional problem for Fort Huachuca of "no control over the rate of pumping nor over the drilling of new wells in the privately-owned area" has been recognized by the Army for almost as long. In July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

"The ground water in the area of the post well field is overdrawn, and a large cone of depression has been formed in the water table. Water levels in the area of influence (a radius of 1 to 2 miles) have continued to decline and will continue until and unless pumping is reduced. The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately-owned area. ...

Increasing the pumping capacity in or near the post well field will aggravate the problem of declining water levels. The water requirements for the base should not be increased until new sources of water have been put on line to lower the pumping rate from the existing well field, and to furnish reserve pumping capacity."⁷³

ACOE then commissioned an additional study to confirm the problems that they had identified. On March 18, 1974, the Arizona Water Commission reports on a study requested by ACOE "to prepare a special report evaluating the adequacy of Fort Huachuca's water supply based upon the Commission's regional studies,"

"The model predicts reductions in the aquifer discharge to the rivers ranging from 20 percent to about 50 per cent for the four runs. This would reduce base flows as well as and probably reduce the water supply available to phreatophytic vegetation along portions of the San Pedro and Babocomari Rivers."⁷⁴

Then, following up on the Arizona Water Commission's report, on March 29, 1974, ACOE again warns of Fort Huachuca's water problem in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report,"

"Two significant cones of depression have developed in the area due to pumping in the Fort Huachuca-Sierra Vista area and the Huachuca City area, which includes the former community of Huachuca Vista... The depression cone in the Fort Huachuca-Sierra Vista area is centered about the military post well field and appears to extend for approximately 4 miles... the cone of depression is approximately 1.5 miles wide. ...

⁷² "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S. Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.

⁷³ "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

⁷⁴ *Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area, Arizona*; Arizona Water Commission, March 18, 1974.

Heavy pumping in the Huachuca Vista area has apparently reversed the direction of ground-water flow along the reach of the Babocomari River for several miles downstream from Huachuca City...⁷⁵

Thirty years later, Fort Huachuca's water problem was still making headlines. On February 4, 2006, in "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ...

Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.

While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.

What is unrecognized by many is "we didn't do well in some areas," Hunter said.

One area of concern of water...

With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said.⁷⁶

Fort Huachuca obviously realized that the "water conservation clock" was problematic when it covered up GeoSystems (2010)⁷⁷ where the Base's own consultant found that,

"Figure 23 [Changes in Stream Discharge Due to ON-POST] shows that, out of these three years, the simulated impact of on-post wells on baseflow in the Babocomari and the San Pedro rivers peaked in 2003, with the greatest impact, depletions of 1 to 2 cubic-feet per second (cfs), occurring at the confluence of the two rivers."⁷⁸ ...

⁷⁵ Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report, U.S. Army Engineer District, Los Angeles, Corps of Engineers, March 29, 1974.

⁷⁶ "Garrison commander says water is a threat to fort." Bill Hess, Sierra Vista Herald, February 4, 2006.

⁷⁷ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, prepared by GeoSystems Analysis, Inc. November 2010.

⁷⁸ *Ibid.*, page 3-11.

Figure 24 [‘Changes in Stream Discharge Due to All Fort-Attributable Pumping’] shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23 [‘Changes in Stream Discharge Due to ON-POST’], those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence.”⁷⁹

“...peak impacts to simulated baseflow occur in 2050 [page 3-11] ... Figure 27 [‘Stream Reaches Pumped Dry by FORT-Related Wells ON- and OFF-Post’] shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping.”⁸⁰

And now in 2019, the full extent of Fort Huachuca-attributable groundwater pumping from 2011 to 2100, and the Base-attributable groundwater pumping’ harm to the San Pedro River is becoming more apparent. On November 21, 2019, Integrated Hydro Systems finds that at year 2100, modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdowns)

“... exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs.”⁸¹

Even more concerning is Hydro Systems (2019) further conclusion that,

“It should be noted that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100.”⁸²

Predictably, though, “those who share the Sierra Vista Subwatershed,” Fort Huachuca, Sierra Vista, Huachuca City, Tombstone, Bisbee, and Cochise County have failed the congressional mandate to bring use and recharge into balance by 2011. Consequently, the words of Fort Huachuca Garrison Commander Colonel Hunter, “[t]he biggest threat to this Southern Arizona Army post is water” now ring more true than ever. The “water conservation clock” has run out.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*, page 3-15.

⁸¹ Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019., page 13.

⁸² *Ibid.*, pages 4-5.

ENDANGERED SPECIES ACT LAW

I. ESA requirements

A. Section 7 consultation requirements

The ESA is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.” *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). Its purpose is to conserve endangered and threatened species and the ecosystems upon which they depend. 16 U.S.C. § 1531(b). Section 7(a)(2) of the ESA prohibits federal agencies from undertaking actions that are “likely to jeopardize the continued existence” of any listed species or “result in the destruction or adverse modification of” critical habitat. *Id.* § 1536(a)(2). “Jeopardy” results when it is reasonable to expect, “directly or indirectly,” that the action would appreciably reduce “the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” 50 C.F.R. § 402.02. “Adverse modification” is defined as “a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species.” *Id.*

To enable compliance with section 7’s substantive mandate, the ESA and its implementing regulations impose specific procedural duties on federal agencies, requiring an “action agency”—in this case, the Fort—to consult with FWS before undertaking any “action” that “may affect” a listed species or its designated critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). An “action” includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies,” in which there is “discretionary Federal involvement or control.” 50 C.F.R. §§ 402.02, 402.03. The “may affect” threshold for consultation under section 7(a)(2) is low, and is triggered by “[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character.” *Nat’l Parks Conservation Ass’n v. Jewell*, 62 F. Supp. 3d 7, 13 (D.D.C. 2014) (quoting 51 Fed. Reg. 19,926, 19,949–50 (June 3, 1986)). FWS and the action agency must use the best scientific and commercial data available throughout the consultation process. 16 U.S.C. § 1536(a)(2).

As a first step, the Federal action agency prepares a biological assessment (“BA”). 50 C.F.R. §§ 402.02, 402.12. The BA must evaluate the potential “effects of the action” on listed and proposed species and designated and proposed critical habitat within the “action area” and determine whether any such species or habitat are “likely to be adversely affected by the action.” *Id.* § 402.12(a), (c). “Effects of the action” are defined as “the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.” *Id.* § 402.02. “Indirect effects” are those that are “caused by the proposed action and are later in time, but still are reasonably certain to occur.” *Id.* “Interrelated actions” are those that are “part of a larger action and depend on the larger action for their justification.” *Id.* “Interdependent actions” are those that “have no independent utility apart from the action under consideration.” *Id.* Finally, “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” *Id.*

The type of consultation required is determined by the degree of anticipated effects reported in the BA. Informal consultation is sufficient if the action agency determines, with FWS’s written concurrence, that the proposed action “may affect,” but is “not likely to adversely affect” the species or its critical habitat. *Id.* §§ 402.13(a), 402.14(b)(1). If informal consultation or the BA conclude that the proposed action “may affect” a listed species or its critical habitat,

the action agency must initiate formal consultation with FWS. *Id.* § 402.14(a). During the consultation process, the action agency may not make any irreversible or irretrievable commitments of resources. 16 U.S.C. § 1536(d). Formal consultation is completed when FWS issues a Biological Opinion determining whether the proposed action, taken together with its cumulative effects, is “likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.” 50 C.F.R. § 402.14(g)(4).

B. Biological Opinions

The BiOp must include a “detailed discussion of the effects of the action on listed species or critical habitat.” *Id.* § 402.14(h)(2). The BiOp can either find (1) no jeopardy or no adverse modification; (2) that the action will cause jeopardy or adverse modification but such jeopardy or adverse modification can be avoided by implementing certain reasonable and prudent alternatives to the proposed action as designed; or (3) that jeopardy or adverse modification is unavoidable and thus the action cannot proceed. *Id.* § 402.14(h)(3). The BiOp’s finding must be based on FWS’s independent analysis of the “action area,” the “effects of the action”—including the action’s “indirect effects” and effects of “interrelated or interdependent” activities—and the “cumulative effects” on listed species or critical habitat. *Id.* §§ 402.02, 402.14(g). In other words, the BiOp must consider “all the impacts . . . which can be anticipated” to result from the action “using the best available science.” *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002) (emphasis added). This means “[a]n agency may not ignore future aspects of a federal action” by segmenting or cutting off its analysis. *Id.* at 1155.

FWS’s jeopardy analysis in a BiOp must consider a species’ survival and recovery. 50 C.F.R. § 402.02; *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 932 (9th Cir. 2008) (noting survival and recovery are “intertwined needs that must both be considered in a jeopardy analysis”). “This does not mean that a jeopardy or adverse-modification analysis must include the formulation of a specific recovery plan.” *Ctr. for Biological Diversity v. Salazar*, 804 F. Supp. 2d 987, 998 (D. Ariz. 2011). Recovery must, however, “be considered explicitly and separately from survival.” *Id.* at 999. During this recovery analysis, FWS must identify when a species “will likely pass the tipping point for recovery, and determine whether the proposed action will cause the species to reach that tipping point.” *Id.* (citing *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 527 (9th Cir. 2010)). That way, the BiOp “provides some reasonable assurance that the agency action in question will not appreciably reduce the odds of success for future recovery planning, by tipping a listed species too far into danger.” *Nat’l Wildlife Fed’n*, 524 F.3d at 936.

If FWS issues a BiOp that does not adequately evaluate the effects of the action and cumulative effects on listed species and critical habitat—considering both survival and recovery—then FWS’s “opinion on whether the action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat” is factually and legally flawed. *See* 50 C.F.R. § 402.14(h)(3). In such instances, the BiOp would fail to adequately assess whether the proposed action was likely to jeopardize listed species. *See Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988).

Any ESA violation—including a legally flawed BiOp—is subject to judicial review under the ESA’s citizen suit provision. 16 U.S.C. § 1540(g)(1)(A).

In assessing jeopardy, each agency shall use the best scientific and commercial data available. 16 U.S.C. § 1536(a)(2). Looking at the best scientific and commercial data available is a standard that requires far less than conclusive proof. *Greenpeace v. National Marine Fisheries Service*, 55 F. Supp. 2d 1248, 1262 (W.D. Wash. 1999). This standard recognizes that better scientific evidence will most likely always be available in the future.

ENDANGERED SPECIES ACT VIOLATIONS

A. The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses.

The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses. Such reliance betrays the fact that FWS has stated clearly that "[t]o adequately address the overdraft of groundwater in the Upper San Pedro Basin and insure the health of the San Pedro River and the species that depend on it, some current uses of water must cease."⁸³ "[A]voided future use" contributes nothing to correcting the current deficit groundwater pumping problem.

Even for actual retired groundwater pumping, FWS says that "this water use reduction cannot be used to mitigate future projects and the water use that may occur with those projects."⁸⁴ The BiOp at 294 states that "[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."⁸⁵ Nonetheless, Fort Huachuca and FWS rely upon "avoided future use" to avoid acknowledging that Fort Huachuca-attributable groundwater pumping jeopardizes the San Pedro River and its representative and dependent endangered species.

B. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel.

The BiOp inappropriately relies upon water-savings credits for "retirement" of agricultural groundwater pumping from the Preserve Petrified Forest parcel that had already ended in 2004.⁸⁶

The Preserve Petrified Forest parcel, sometimes also referred to as the Three Canyons/Palominas parcel, is located only 1.25 miles west of the San Pedro River. Restarting of the agricultural pumping would be capturing 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years from water that would otherwise be

⁸³ Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow, to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

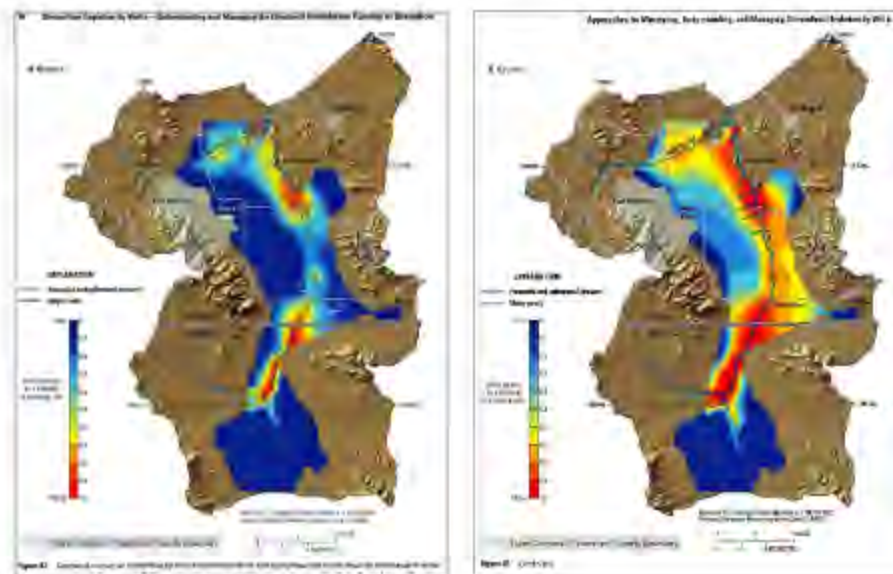
⁸⁴ *Ibid.*

⁸⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

⁸⁶ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, R.G. Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget, U.S. Geological Survey, 2014, Table 4, page 8.

supplying surface water to the San Pedro.⁸⁷ Such an aggressively destructive action would never overcome the legal challenges against the theft of federal water⁸⁸ and against the obvious and blatant "taking" that would result from the pumping's jeopardizing the San Pedro River and its representative and dependent federally listed endangered species.⁸⁹ The following maps are illustrative of just how clearly "taking" of San Pedro River surface water would be demonstrated in any legal challenge to the parcel's reinstatement of agricultural pumping.

The following maps from U.S. Geological Survey's ("USGS") 2012, "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow"⁹⁰ illustrate the property's location and the resulting percentage of pumped groundwater that would not end up as streamflow.⁹⁰ Preserve Petrified Forest parcel is the square northwest of Palominas, and west of the San Pedro on the following maps:



⁸⁷ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leske, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>. See in particular: FIGURE 47.

⁸⁸ *Cappaert v. United States* 426 U.S. 128 [1976]; *Kansas v. Colorado*, 115 S. Ct. 1995; *Nebraska v. Wyoming*, 115 S. Ct. 1033, 1937 (1995).

⁸⁹ Section 9 of the ESA and its implementing regulations prohibit the unauthorized "take" of any endangered or threatened species of fish or wildlife. 16 U.S.C. § 1538(a)(1); 16 U.S.C. § 1533(d); 50 C.F.R. § 17.31. "Take" is defined broadly under the ESA to include harming, harassing, trapping, capturing, wounding or killing a protected species either directly or by degrading its habitat. 16 U.S.C. § 1532(19).

⁹⁰ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leske, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>. See in particular: FIGURE 47.

In addition, before preparation of the BiOp, the fact that the Preserve Petrified Forest property was never going to be used for agriculture again, was established by Preserved Petrified Forest's own marketing efforts to subdivide their property for single homes on four acre lots, and not for future agricultural production. On August 6, 2007, in "Of politics and the river; An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," High Country News reports:

"Preserve Petrified Forest is now offering to sell the 480 acres for \$5.2 million, says Sierra Vista Realtor Beth Wilkerson, the listing agent for the land.

Wilkerson says the land is zoned to build up to 161 homes..."⁹¹

Even stepping back from the "avoided future use" fallacy, preventing the water use of 161 homes using approximately 40 acre-feet/year,⁹² is nothing like sham "retirement" already retired agricultural pumping and receiving credit for "retirement" of 2,558 acre-feet/year. BiOp at 29, 45, and 169. Nonetheless, in spite of the facts that (1) agricultural pumping had already stopped,⁹³ (2) that any attempt at restarting agricultural pumping would result in significant capture of San Pedro River surface flow,⁹⁴ and (3) that at most, the non-corrupt purchase to stop development would result in "avoided future use" of only 161 homes,⁹⁵ the BiOp dishonestly credits Fort Huachuca with "immediate" "onset of a 'positive' Fort Huachuca groundwater budget balance... in 2014 or 2015."⁹⁶ Specifically, to highlight FWS' dishonest giving the Fort credit in this scam, the BiOp says,

"The residual, and temporary, reduction in baseflows (modeled to be 0.01 CFS at the most) that may occur before the onset of a "positive" Fort Huachuca groundwater budget balance in 2014 or 2015 [citing "Preserve Petrified Forest conservation measure (C10) in Table HWU2" in BiOp at 169 for 2,558 acre-feet/year beginning in 2014] (wherein a surplus of conservation measure-driven water savings overtakes the influence of Fort Huachuca's water demands on baseflows) will be within the range of conditions experienced by the species and thus, the proposed action is unlikely to result in a contraction of the species occurrence in the San Pedro River..." BiOp at 165.

Earlier, the BiOp at 161, FWS states, equally as dishonestly, that "[i]t is likely...that the relatively large magnitude of net groundwater surplus anticipated to begin to affect the river in 2014 (or later) will ensure the adverse effects will be of short duration, and more than completely ameliorated."

⁹¹ <http://www.hcn.org/issues/351/17143>

⁹² Using the accepted local standard of approximately 0.25 acre-feet/year per home.

⁹³ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget; U.S. Geological Survey, 2014, Table 4, page 8.

⁹⁴ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Lenke, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47.

⁹⁵ "Of politics and the river; An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," John Dougherty, High Country News, August 6, 2007, <http://www.hcn.org/issues/351/17143>.

⁹⁶ Quoting from the footnote (#6) in BiOp at 165: "Again, we note that the Preserve Petrified Forest conservation measure (C10) in Table HWU2 (and Revised PBA Table 5-1) was implemented in 2013, rather than 2014 as anticipated. The effects of the measure will thus occur earlier than initially anticipated (beginning in 2014 rather than 2015)."

C. The BiOp inappropriately limits the BiOp's analysis time to ten years, thus ignoring the adverse effects that will occur beyond that artificial time window.

The BiOp inappropriately relies upon an arbitrary and capricious limitation of the BiOp's analysis time to ten years without any regulatory authority, without basis on FWS' Consultation Handbook,⁹⁷ without basis on the legally mandated use of the best available science,⁹⁸ and with special treatment inconsistent with all other recent FWS' evaluations of military activities in Arizona.⁹⁹ The BiOp's limitation of its analysis time to ten years ignores the facts that (1) the Fort's activities will certainly last longer than 10 years,¹⁰⁰ that (2) the effects of the action will extend well beyond ten years,¹⁰¹ and (3) most deceitfully, that the Fort failed to disclose the fact

⁹⁷ Endangered Species Consultation Handbook, Procedure for Conducting Consultations and Conference Activities Under Section 7 of the Endangered Species Act, U.S. Fish & Wildlife Service and National Marine Fisheries Service, March 1998; https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

⁹⁸ 16 U.S.C. § 1536(a)(2); *Center for Biological Diversity v. Runsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

⁹⁹ For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat, AESO/SE 02-21-95-F-0114R4; August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army National Guard (AZARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station - Yuma, Yuma and Maricopa Counties, Arizona; AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SLL-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

¹⁰⁰ "Runsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense, September 9, 2004, http://www.defenselink.mil/news/Sep2004/n08092004_2004090909.html; National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110-181—JAN. 28, 2008 [\$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110-417—OCT. 14, 2008 [\$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111-84—OCT. 28, 2009 [\$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114-92—NOV. 25, 2015 [\$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114-328—DEC. 23, 2016 [\$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115-91—DEC. 12, 2017 [\$30,000,000].

¹⁰¹ SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.; Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, U.S. Fish and Wildlife Service, January 6, 1997, page 665.; U.S. Fish and Wildlife Service, Biological Opinion concerning impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, Arizona. #AESO/ES 2-21-02- F-229 August 23, 2002, page 205.; Lenke, S.A., Hoffmann, J.P., and Dickinson, J.E., 2005, Numerical ground-water change model of the C aquifer and effects of ground-water withdrawals on stream depletion in selected reaches of Clear Creek, Chevelon Creek, and the Little Colorado River, northeastern Arizona: U.S. Geological Survey Scientific Investigations Report 2005-5277, 29 p., <https://pubs.usgs.gov/sir/2005/5277/>; "Ground Water Development - The Time to Full Capture Problem," J. Bredelhoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x, 2009.; Groundwater Hydrology of the San Pedro Basin, Robert Mac Nish, Kathryn J. Baird, and Thomas Maddock III, Chapter Fifteen in Ecology and Conservation of the San Pedro River, Edited by Juliet C. Stromberg and Barbara Tellman, University of Arizona Press, Tucson, 2009, page 299.; "Calculation of

that its own contractor, GeoSystems Analysis, found that Fort Huachuca-attributable groundwater pumping "peak impacts to simulated baseflow occur in 2050."¹⁰²

The BiOp's arbitrary and capricious evaluation window limitation is dramatized by FWS' special treatment of Fort Huachuca differently from FWS' treatment of other military bases. From 1996 – 2017, FWS' Arizona Ecological Services Office has consulted on the activities of multiple other military bases in Arizona,¹⁰³ however, only Fort Huachuca has had its consultation evaluation period limited to such an artificially narrowed time period. None of these other military activities evaluations were similarly limited by the BiOp's nonsensical rationale that the evaluation must be limited because of "uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process." BiOp at 20 and 158.

None of these other FWS' Arizona Ecological Service Office Biological Opinions are similarly limited with such an artificial time constraint because such a limitation is not legal. It is illegal to piecemeal the evaluation of an agency's actions.¹⁰⁴

In addition, specific to Fort Huachuca, on April 8, 2002, the Court addressed the illegality of Fort Huachuca's attempt at narrowing its evaluation window to piecemeal FWS' consultation:

"Courts have consistently held that [**39] a biological opinion has to "analyze the effect of the entire agency action," *Comer v. Burford*, 848 F.2d 1441, 1453 (9th Cir. 1988), cert. denied, *Sun Exploration & Production v. Luginm* 489 U.S. 1012, 103

Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Lenke, S.A., U.S. Geological Survey Circular 1376, 2012.

<https://pubs.usgs.gov/circ/1376/>; Gungle, B., J. B. Callagary, N.V. Pareni, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg. 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

¹⁰² Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010; page 3-11.

¹⁰³ For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat; AESO/SE 02-21-95-F-0114R4; August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army National Guard (AZARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station - Yuma, Yuma and Maricopa Counties, Arizona; AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011.; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SSL-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

¹⁰⁴ *Comer v. Burford*, 848 F.2d 1441, 1453 (9th Cir. 1988).; *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al.*, *CII99-203 TUC ACM*, 198 F. Supp. 2d 1139, April 8, 2002.

L. Ed. 2d 184, 109 S. Ct. 1121 (1989) (emphasis added), including all indirect and cumulative effects of the action on threatened and endangered species, 50 C.F.R. § 402.14(g)(3); 50 C.F.R. § 402.02. An agency may not ignore future aspects of a federal action by segmenting that action into phases. In fact, in *Conner*, the Court held that all phases of oil and gas leasing had to be evaluated for potential impacts at the leasing stage, even though the final phase -construction of oil and gas wells - was uncertain to occur. *Conner*, 848 F.2d at 1453-1458; See also *North Slope Borough v. Andrus*, 206 U.S. App. D.C. 184, 642 F.2d 589, 608 (D.C. Cir. 1980 (agency may not deal exclusively with one stage of the project).

In *Conner*, the FWS issued a biological opinion only with regard to the leasing stage because it did not have sufficient data to render a comprehensive [**40] opinion beyond the initial leasing phase. Instead of issuing a comprehensive biological opinion the FWS concluded that the leasing phase did not jeopardize endangered species. The FWS envisioned an "incremental-step consultation approach, with additional biological evaluations prior to subsequent activities. The court rejected this. The fact that insufficient evidence was available did not excuse the FWS from rendering a comprehensive opinion on the entire agency action. The court explained, as follows:

Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available ... We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. *Conner*, 848 F.2d at 1453-1454."

Looking specifically at *Conner*, FWS' disregard for the law and legal precedent in the BiOp becomes even more offensive:

"Appellees argue that the FWS failed to prepare biological opinions based on the best data available. We agree. The FWS took the position that there was insufficient information on post-leasing activities to prepare comprehensive biological opinions. Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available. For example, appellees point out that three-fourths of the area studied in the forests had been designated "essential" or "occupied" habitat for protected species. See Appellees' Exhibit 11. Indeed, the environmental assessments prepared by the Forest Service contained detailed information on the behavior and habitats of the species, and discussed the likely impact of various stages of oil and gas activities. See *Threatened and Endangered Species Biological Evaluation (Flathead EA, Appendix G)* (E.R. at 260-87); *Biological Evaluation (Gallatin EA, Appendix B)* (E.R. at 311-95); see also *Gallatin Biological Opinion at D7* (E.R. at 401). We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. 16 U.S.C. Sec. 1536(a)(2). With the post-leasing and biological information that was available, the FWS could have determined whether post-leasing activities in particular areas were fundamentally incompatible with the continued existence of the species. Indeed, by recommending the exclusion of areas

where leasing would conflict with the conservation of protected species, the FWS implicitly admitted that even minimal exploration and development would be incompatible with the conservation of the species in some areas that can be identified before any agency action is taken.³⁰ Gallatin Biological Opinion at D7 (E.R. at 401). With the information available, the FWS could also have identified potential conflicts between the protected species and postleasing activities due to the cumulative impact of oil and gas activities. For example, species like the grizzly and the gray wolf require large home ranges making it critical that ESA review occur early in the process to avoid piecemeal chipping away of habitat. See *id.*

Furthermore, although the FWS justified the decision to delay completing comprehensive biological opinions on the inexact information about post-leasing activities. Congress, in enacting the ESA, did not create an exception to the statutory requirement of a comprehensive biological opinion on that basis. The First Circuit, for example, has recognized that the Secretary may be required to make projections, based on potential locations and levels oil and gas activity, of the impact of production on protected species. See *Roosevelt Campobello Int'l Park Comm'n v. EPA*, 684 F.2d 1041, 1052-55 (1st Cir.1982) (EPA must prepare "real time simulation" studies of low risk oil spills despite the fact that study will only produce informed estimate of potential environmental effects).

In light of the ESA requirement that the agencies use the best scientific and commercial data available to insure that protected species are not jeopardized, 16 U.S.C. Sec. 1536(a)(2), the FWS cannot ignore available biological information or fail to develop projections of oil and gas activities which may indicate potential conflicts between development and the preservation of protected species. We hold that the FWS violated the ESA by failing to use the best information available to prepare comprehensive biological opinions considering all stages of the agency action, and thus failing to adequately assess whether the agency action was likely to jeopardize the continued existence of any threatened or endangered species, as required by section 7(a)(2). To hold otherwise would eviscerate Congress' intent to "give the benefit of the doubt to the species."³¹ [Footnote 31: H.R. Conf. Rep. No. 96-697, 96th Cong., 1st Sess. 12, reprinted in 1979 U.S. Code Cong. & Admin. News 2572, 2576.]...¹⁰⁵

Further, the idea that DOD is not intending to fund Fort Huachuca indefinitely is absurd. Former Defense Secretary Donald Rumsfeld addressed the long-term nature of military planning in 2004:

"The secretary wouldn't hazard a guess on how long the war on terror might last. The answer, he said, is as long as it takes. He said that if any world leaders at the end of World War II had tried to guess how long the Cold War would last, they likely would have been wrong. ...

Rumsfeld said he didn't know how long it would take to defeat terrorism. He noted it took more than four decades and perseverance on the part of presidential

¹⁰⁵ In its April 8, 2002, Order in *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al.*, CIV99-203 TUC ACM, 198 F. Supp. 2d 1139, April 8, 2002, pages 12-13.

administrations from both political parties to succeed in bringing down the Soviet Union."¹⁰⁶

Consistent with the fact that the Army has no intentions of limiting its activities at Fort Huachuca to ten years, the Army has lobbied for and secured \$208,877,000 in the last ten years alone for "Authorized Army Construction and Land Acquisition Projects" for Fort Huachuca.¹⁰⁷ Obviously, the Army is not investing almost \$209 million in construction and acquisition projects at Fort Huachuca merely for just a ten year stay. The Army is investing almost \$209 million at Fort Huachuca over the last ten years because it is planning on using the Base for a long time.

The BiOp's Programmatic Biological Assessment ("PBA")¹⁰⁸ rationalizes narrowing the consultation's evaluation to ten years because "[a]fter ten years, the uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process becomes considerably more difficult and uncertain." But then to rationalize this statement, the PBA says,

"However, planners in Arizona generally project water supplies and demands out to twenty years to plan for capital investments in water infrastructure to supply future population growth with water. The State of Arizona requires community water systems to develop System Water Plans that project water supplies and demands from 2010 to 2030 (ADWR 2011). In addition, modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River." [Pages G-13-14.]

Fort Huachuca's using of the State of Arizona's water policy for community water systems as rationale for an artificially narrowed evaluation window is sinister and particularly disingenuous. In fact, it is a lie by omission.

¹⁰⁶ "Rumsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense, September 9, 2004, http://www.defenselink.mil/news/Sep2004/h09092004_2004090909.html.

¹⁰⁷ National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110-181—JAN. 28, 2008 [\$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110-417—OCT. 14, 2008 [\$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111-84—OCT. 28, 2009 [\$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114-92—NOV. 25, 2015 [\$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114-328—DEC. 23, 2016 [\$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115-91—DEC. 12, 2017 [\$30,000,000].

¹⁰⁸ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24, Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

Fort Huachuca misrepresents the State of Arizona's water policy prowess knowing that (1) the State of Arizona requires that its developers provide proof that water will be available for 100 years in order to secure a permit to supply groundwater for their developments,¹⁰⁹ and (2) the State of Arizona does not follow the laws of physics and hydrology in evaluating the effects of the permitted wells' groundwater pumping on connected surface water when granting well permits for developers.¹¹⁰ FWS is well aware of these facts as well; yet, in the BiOp, FWS never questions the Base's cherry picking of an irrelevant State of Arizona policy in the PBA as the basis for Fort Huachuca's artificially narrowed evaluation window in the BiOp.

In addition, FWS' allowing Fort Huachuca to limit its analysis window to ten years, also ignores the Court's April 11, 2002, finding of fact on the short-term efficacy of a significant portion of the Base's claimed recharge mitigation credit, the City of Sierra Vista's wastewater treatment plant or the Environmental Operations Plant ("EOP"). BiOp at 168. On April 11, 2002, the Court found as a finding of fact that,

"This recharge project [the City of Sierra Vista's wastewater treatment plant] is not intended to compensate for or mitigate the effects of groundwater pumping. The project is designed to create a "mound" of groundwater between the cone of depression and the river that will, in theory, prevent baseflow from the San Pedro from flowing back into the groundwater during the next twenty years. (Admin. Rec. Ex. 5: Planning Aid Memorandum at 10.) [**38] This will delay and mask the effects of the deficit groundwater pumping, (Admin. Rec. Ex. 2: Final BO at 121), but this is not a mitigating factor in relation to the Army's ten-year plan."¹¹¹

The reason Fort Huachuca arbitrarily limited its analysis window to ten years is obvious when the Fort's hydrological footprint is examined objectively and beyond such an artificial window. The BiOp cites a GeoSystems Analysis (2010) study, "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca."¹¹² The BiOp, at 71 and 102, says,

"Recent groundwater modeling (GeoSystems Analysis 2010) suggests that effects from historical groundwater withdrawals in the regional aquifer (1940 to 2003; PBA Section 3.5.6) would result in reduced flows in the Babocomari River. Since the

¹⁰⁹ A.R.S. 45-108 Evaluation of subdivision water supply, definition ... I. For the purposes of this section, "adequate water supply" means both of the following: 1. Sufficient groundwater, surface water or effluent of adequate quality will be continuously, legally and physically available to satisfy the water needs of the proposed use for at least one hundred years.

¹¹⁰ Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Opinion in the Supreme Court of the State of Arizona, Robin Silver, M.D.; United States of America, U.S. Department of the Interior, Bureau of Land Managements; and Patricia Gerrodette, Plaintiffs/Appellees, v. Pueblo Del Sol Water Company, an Arizona Corporation; Thomas Buschatzke, in his Official Capacity as Director of the Arizona Department of Water Resources; Arizona Department of Water Resources, an Agency of the State of Arizona, Defendants/Appellants.; No. CV=16-0294-PR, filed August 9, 2018.

¹¹¹ Center for Biological Diversity, et al., Plaintiffs, v. Donald H. Rumsfeld, Secretary of Defense, et al., Defendants, Coalition of Arizona/New Mexico Coalition of Counties for Stable Economic Growth, Defendant-Intervenors, CIV 99-203 TUC ACM, UNITED STATES DISTRICT COURT FOR THE DISTRICT OF ARIZONA; 198 F. Supp. 2d 1139; 2002 U.S. Dist. LEXIS 7419; 54 ERC (BNA) 1391; 32 ELR 20640, April 8, 2002, Decided; April 11, 2002, Filed.

¹¹² "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

Babocomari River contributes flow to the San Pedro River upstream of the Tombstone gaging station, there is the potential that declines in Babocomari River baseflow could account for some portion of the declines in winter baseflow observed at the San Pedro River at the Tombstone gage."

GeoSystems Analysis (2010) is similarly cited in the BiOp, (at 293), in the Yellow-billed Cuckoo section, regarding the fact that "groundwater pumping has already negatively affected the Babocomari River flow." In addition, the BiOp, at 102, includes from GeoSystems Analysis (2010) a figure ("EB19") of "[s]imulated changes in stream discharges due to pumping from all wells in the upper San Pedro Basin."

Review of GeoSystems Analysis (2010), which was never given to FWS,¹¹³ however, reveals the primary and deceitful reason that Fort Huachuca and FWS limit the BiOp's evaluation window. GeoSystems Analysis (2010) shows that on-post and Fort-attributable groundwater pumping off-post are already and will into the future have negative effects on the San Pedro.

From GeoSystems Analysis (2010):

"Results reveal that simulated cumulative (1902-2105) on-post pumping comprises only 5% of basin-wide pumping, but it is responsible for 31% of baseflow capture, 3% of ET capture, and 4% of total storage depletion in the basin. All simulated Fort-attributable pumping (on and off post) comprises 19% of basin-wide pumping, and accounts for 65% of total baseflow capture, 7% of ET capture, and 21% of all storage depletion in the basin by 2105.

Simulated stream depletions related to Fort-attributable pumping are concentrated at the confluence of the Babocomari and San Pedro rivers, as well as several miles upstream on each river. Simulated stream depletions from on-post pumping only peak in the mid-21st Century, and including two 250-meter (820-foot) stream reaches that were "pumped dry" on the Babocomari in 2050. Total simulated Fort-related pumping (on- and off-post) dried out of a maximum of five stream reaches (1025 meters, 3363 feet) in 2050, and three reaches by the end of the simulation period in 2105." [Pages i-ii]

While simulated Fort-attributable pumping accounts for only 19% of total basin pumping from 1902-2105, the Fort's simulated impact on baseflow capture is again large relative to its total pumping, as indicated in Figure 17. The capture simulations estimate that 186,237 AF out of a total of 293,383 AF, or 63%, of captured baseflow in the USPB is caused by Fort-attributable pumping during the period 1902-2105. [Page 3-5]

Aquifer storage is by far the most important source of water for all simulated Fort-attributable pumping, both on and off post. Simulated on-post wells derive approximately 63% of all their pumped water from aquifer storage, 32% from stream baseflow capture, and 5% from ET capture (Figure 19). Roughly 79% of all simulated Fort-attributable pumping derives from aquifer storage, while 17% comes from stream baseflow capture, and 4% from ET capture (Figure 20). [Page 3-7]

In order to understand the spatial impacts of simulated Fort-attributable baseflow capture, pumping-induced changes in stream discharge (baseflow) were

¹¹³ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

mapped for three discreet points in time: 2003, 2050, and 2105 (figures Figure 23 through Figure 25). ... [Page 3-10]

Figure 24 shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23, those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence.

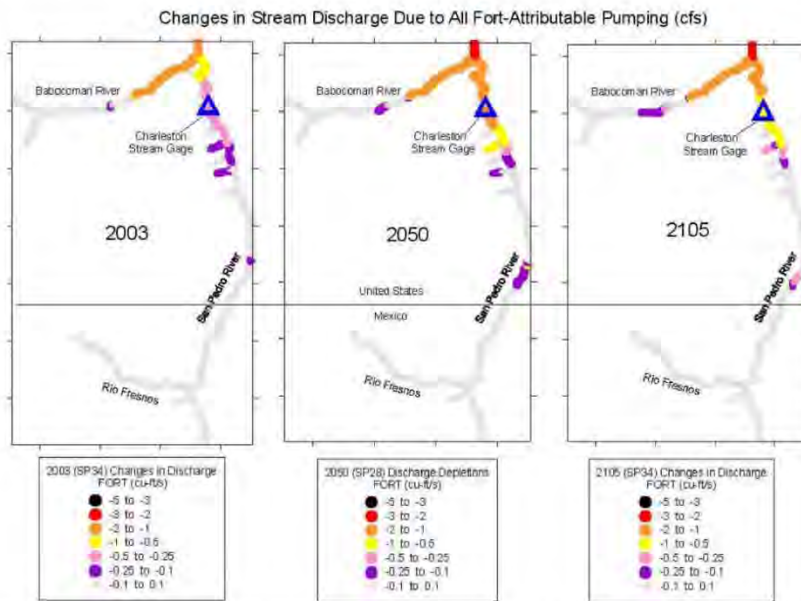


Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

... Figures 26-28 map the stream reaches that were simulated as having gone dry as a result of groundwater extractions from on-post wells, from all Fort-attributable pumping, and from all USBP wells, respectively. Figure 26 shows that in 2050, two reaches in the Babocomari were simulated as being “pumped dry” by on-post wells. ...

Figure 27 shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping. In this case, simulated Fort-attributable pumping produced two dry reaches in 2003, five in 2050, and three in 2105. ..." [Page 3-15]¹¹⁴

Stream Reaches Pumped Dry by FORT-Related Wells ON- and OFF-Post

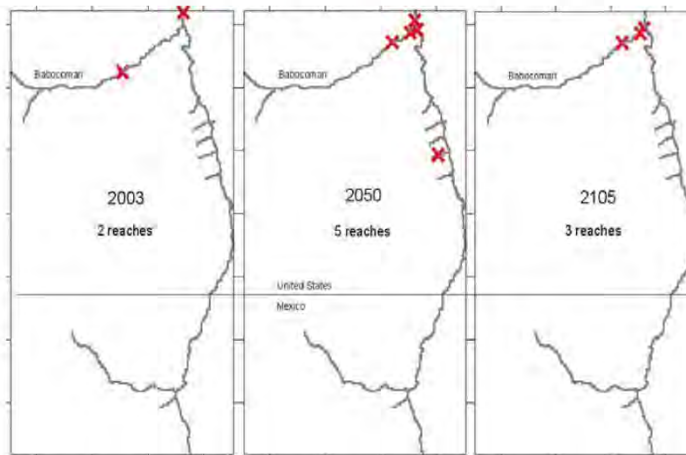


Figure 27. Stream Reaches Simulated as Being Pumped Dry by Fort-attributable Pumping On and Off post.

Opening of the evaluation window only to 2050 here reveals the Fort Huachuca-attributable damage to the San Pedro River and its Babocomari River tributary and the resulting jeopardy for the endangered species representative of and dependent on the San Pedro.

¹¹⁴ Ibid.

The dishonesty of narrowing the BiOp's evaluation window to 2012 – 2024 is further graphically illustrated by Integrated Hydro (2019). The BiOp illustrates its "no effect" finding in Figure 10 of PBA Appendix G:

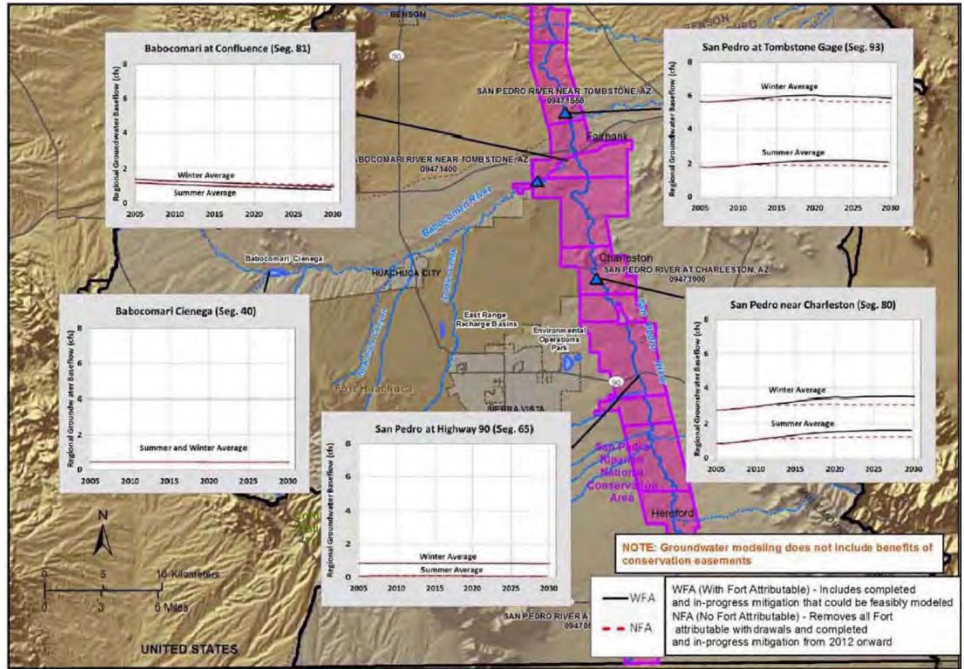


Figure 10. Simulated Regional Groundwater Baseflow for Locations in the Sierra Vista Subwatershed

Note how there is no negative change to 2030 in Figure 10 of the BiOp's PBA Appendix G.

But when Integrated Hydro (2019) opens the evaluation window beyond 2030, exposure of the resulting reduction in streamflow is dramatic at all four gaging stations:

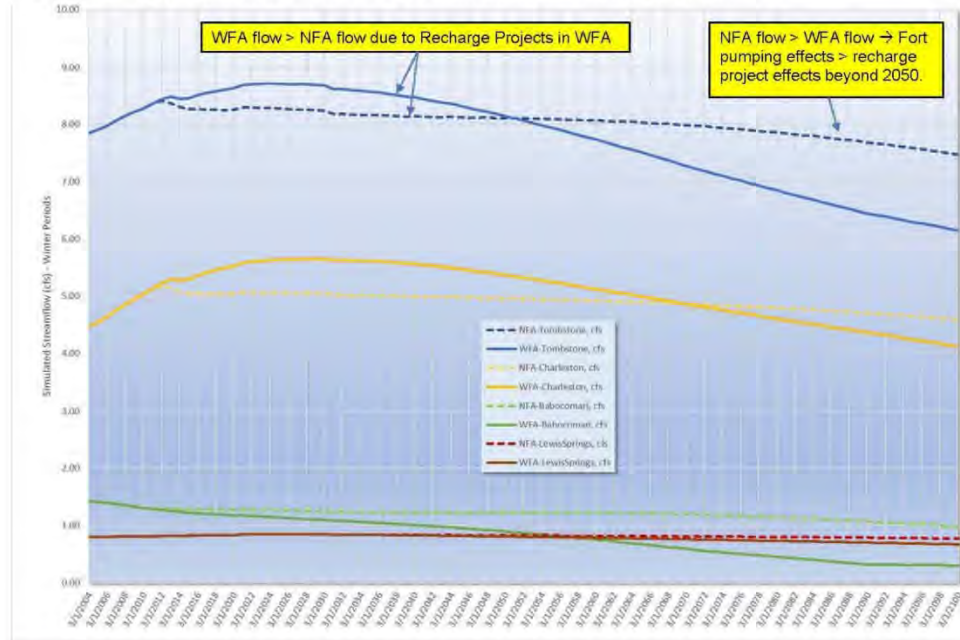


Figure 18. Simulated Streamflow and Change in Streamflow at Key Surface Flow Gages (see Figure 16 for locations).

Note that at the Tombstone gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052; at the Charleston gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2070; at the Babocomari gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2006; and at the Lewis Springs gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052.

Please also note that Integrated Hydro (2019) further qualifies its results noting "that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011. This is an important consideration described further in a study referenced in the 2014 PBA, App-G study (i.e., *GeoSystems Analysis, Inc (GSA). 2010a. Calculation of Pumping-Induced Baseflow and evapotranspiration Capture Attributable to Fort Huachuca. Prepared for Environmental and Natural Resources Division, Fort Huachuca. Collaborated with Vernadero Group Inc. November 2010*). Figure 13 in the GSA, 2010a study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San

Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."¹¹⁵

In terms of diminishing water levels (drawdown) from Fort Huachuca-attributable groundwater pumping, Integrated Hydro (2019) concludes,

"Simulated Fort-Attributable drawdown of groundwater levels (or drawdown) at year 2100 ... [d]rawdowns exceed 18 meters in the central high density pumping well [Fort Huachuca/Sierra Vista] area, 2 meters beneath, and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."¹¹⁶

It is obvious why Fort Huachuca not only covered up GeoSystems (2010), but why the Base and FWS narrowed the BiOp's evaluation window to 2014 – 2024 so as to avoid having to acknowledge Fort-attributable jeopardy to the San Pedro River and its representative and dependent endangered species.

D. The BiOp fails to include the effects of Fort Huachuca's pre-BiOp, attributable groundwater pumping in its hydrological modeling.

The BiOp fails to include the effects on the San Pedro River of Fort Huachuca's pre-BiOp attributable groundwater pumping. The amount of pre-BiOp Fort Huachuca groundwater pumping is graphically illustrated in GeoSystems (2010):

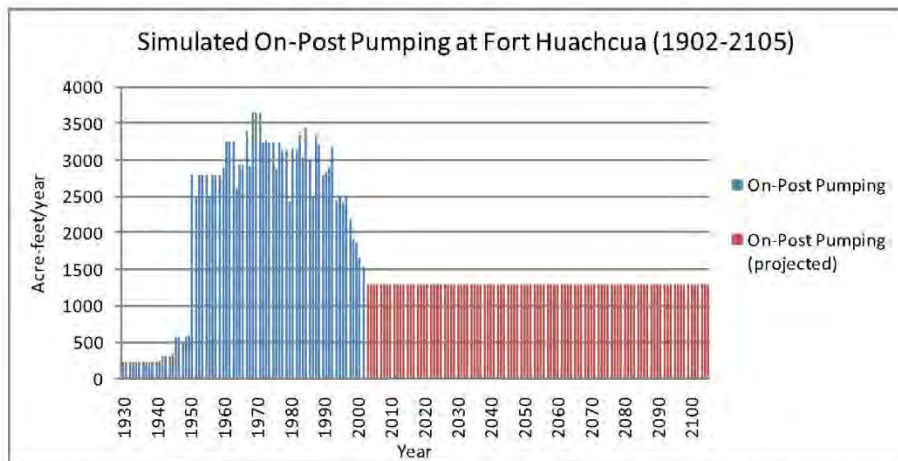


Figure 3. Simulated On-post Pumping at Fort Huachuca 1902-2105 (af/yr).

¹¹⁵ "Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100)" prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, Colorado, www.integratedhydro.com, November 21, 2019.; pages 4-5.

¹¹⁶ Ibid., page 13.

From GeoSystems (2010) Figure 3, the on-post groundwater pumping alone from 1950 – 2002 totals approximately 150,090 acre-feet cumulatively. The pre-BiOp numbers in GeoSystems (2010) come from Pool and Dickinson (2007)¹¹⁷ but Figure 3 does not include the total off-post Fort Huachuca-attributable groundwater pumping.

Total off-post Fort Huachuca-attributable groundwater pumping can be estimated from GeoSystems (2010) Figure 13 where off-post Fort-attributable groundwater pumping was estimated by GeoSystems (2010) from "estimated Fort-attributable population."¹¹⁸

GeoSystems (2010) Figure 13 shows "Simulated Cumulative Fort-attributable Pumping in USPB [Upper San Pedro Basin], 1902-2105.":

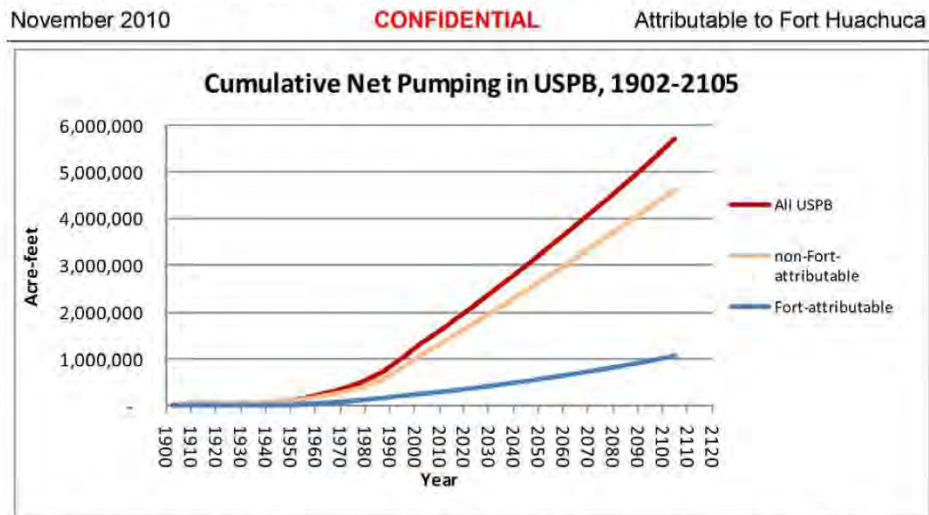


Figure 13. Simulated Cumulative Fort-attributable Pumping in USPB, 1902-2105.

From GeoSystems (2010) Figure 13, the cumulative Fort-attributable groundwater pumping debt in 2002 is approximately 300,000 acre-feet.

The BiOp should have included these cumulative totals in their models to fairly evaluate Fort Huachuca's effects on the San Pedro River and its representative and dependent endangered species as the detrimental effects of groundwater pumping continue long after the pumping stops.

But the BiOp does not include these cumulative totals in its models in spite of FWS' own words,

"Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

¹¹⁷ GeoSystems (2010) on page I, 1-1, and 1-4 cites Pool and Dickinson (2007) for "on post-pumping from 1902-2003: "Ground-Water Flow Model of the Sierra Vista Subwatershed and Sonoran Portions of the Upper San Pedro Basin, Southeastern Arizona, United States, and Northern Sonora, Mexico, in coop. with the Upper San Pedro Partnership and U.S. Bureau of Land Management." Pool, D.R. and J.E. Dickenson, U.S. Dept. of Interior, U.S. Geological Survey Scientific Investigations Report 2006-5228, 2007.

¹¹⁸ GeoSystems (2010), page i.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."¹¹⁹

To make the BiOp's failure to include the pre-BiOp pumping even more nefarious, GeoSystems (2010) also found that Fort Huachuca's deleterious pre-BiOp attributable groundwater pumping's effects were already apparent in 2003.¹²⁰ The BiOp does not reflect this GeoSystems (2010) finding.

GeoSystems (2010) Figure 24 for 2003 illustrates Fort Huachuca's pre-BiOp groundwater pumping effects:

Calculation of Pumping-Induced Baseflow and Evapotranspiration Capture
Attributable to Fort Huachuca **CONFIDENTIAL** November 2010

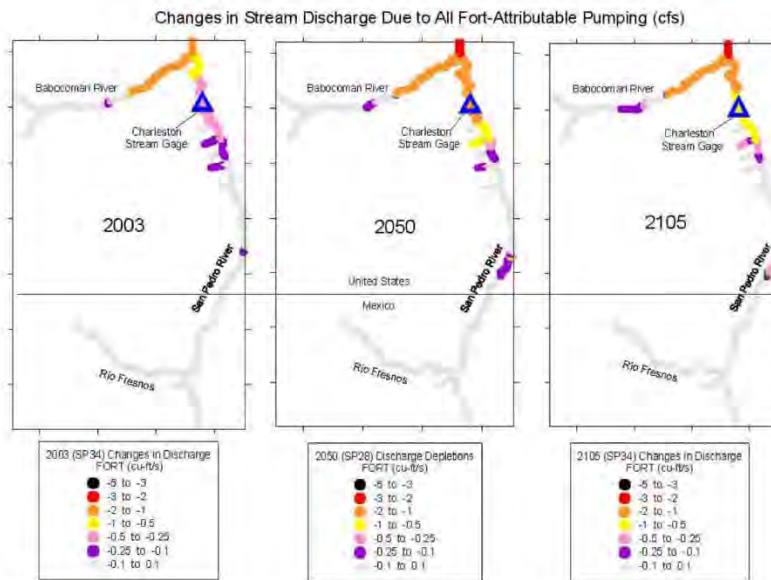


Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

¹¹⁹ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665. Water and Environmental Systems Technology, Inc. 911994) is: SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.

¹²⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, prepared by GeoSystems Analysis, Inc. November 2010; page 3-11 and 3-13.

Further, even if all groundwater pumping were stopped abruptly, the effects of the Fort Huachuca/Sierra Vista groundwater pumping does not stop.¹²¹ Specific to Fort Huachuca-attributable groundwater pumping, pre-BiOp effects will continue to negatively affect San Pedro River baseflow through the year 2088.¹²² The obvious reason that Fort Huachuca and FWS chose not to include the Fort's pre-BiOp attributable groundwater pumping in the BiOp evaluation is to artificially minimize and to obscure the true extent of Fort Huachuca's detrimental impact on the San Pedro River and its representative and dependent endangered species.

In spite of the fact that pre-BiOp Fort Huachuca-attributable groundwater pumping continues to harm the San Pedro River into the future through the year 2088,¹²³ the BiOp's hydrological modeling starts with data from 2003, while the BiOp's analysis of potential effects starts in 2011. The fact that the BiOp's hydrological modeling starts from 2003 is found in the BiOp's Biological Assessment Appendix G at G13 and G14:

"... to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [With Fort-attributable simulation] and the NFA [No Fort-attributable] simulations use the modeling period from 2003-2030."¹²⁴

In an attempt to hide even more of Fort Huachuca's harmful effects, the time window of the BiOp's evaluation of the effects of Fort Huachuca's effects on the San Pedro is narrowed even further in the PBA at 5-11 and in the BiOp at 20, 168 and 169:

"Analysis of the potential effects from Fort-attributable groundwater use was conducted using groundwater demand accounting of the Fort Huachuca activities in 2011. ... this consultation covers 2014 to March 31, 2024."

Ignoring the effects of Fort Huachuca's pre-BiOp pumping is arbitrary and capricious. It is not as if FWS didn't know already that Fort Huachuca's pre-BiOp groundwater pumping continues to capture groundwater that would otherwise end up as San Pedro River surface flow. FWS' January 6, 1997, Final rule of the Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, USFWS states:

"Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

¹²¹ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>.

¹²² U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix.

¹²³ Ibid.

¹²⁴ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona Contract No. W91278-09-D-0099 Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, November 2013 ("PBA"); Appendix G, Groundwater Modeling Report at G-13 and G-14.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."¹²⁵

And FWS' August 23, 2002, Biological Opinion on Fort Huachuca's activities states,

"Interestingly, even if all groundwater pumping in Sierra Vista and Fort Huachuca ceased and agricultural pumping rates were fixed at 1988 levels, modeling showed that average annual flows would still decline at Charleston, Fairbank, and at Benson Narrows (WESTEC 1994). This would occur because over time the cone of depression is expected to flatten out, even if the volume of the cone is decreasing. As it flattens out, it could capture the base flow of the San Pedro River (C. Rovey, WESTEC, pers. comm., 1995). This indicates that balancing water use and water supply may not be enough to prevent capture of river base flow by the cone of depression." [page 95]

Table 9. Summary of groundwater and other modeling efforts in the upper San Pedro River basin, Arizona, that predicted future river flow or extent of riparian vegetation. ... Source ... *WESTEC (1994): This effort used the MODFLOW model with modifications by the authors. Outputs are annual average flows, which lump flood flows with base flows. Flows are modeled from 1988-2088.*; Scenario ... No pumping at the Fort/Sierra Vista after 1988, pumping in rural/agricultural areas at 1988 rates... Effects on upper San Pedro River flows or riparian vegetation ... Annual average flows decline at Charleston (42.7 cfs in 1988 to 41.5 cfs in 2088), at Fairbank (44.8 cfs in 1988, 43.6 cfs in 2088), at Benson Narrows (42.0 cfs in 1988 to 39.6 cfs in 2088) [page 97] ...

Even if enough conservation measures are implemented so water supply equals or exceeds water use, the cone of depression is expected to continue its lateral expansion as it flattens out and could dewater portions of the San Pedro River (see scenario 1 of WESTEC 1994, Table 9) [page 130]¹²⁶

"WESTEC 1994" is "San Pedro Hydrologic System Model, U.S. Bureau of Reclamation Scenarios by Water & Environmental Systems Technology, Inc. Specifically, WESTEC (1994) says,

"Scenario FWO-I assumed there is no future pumping in the Sierra Vista/Fort Huachuca area after 1988. ... This scenario predicts that even if all Sierra Vista area pumping were stopped, the cone of depression that is currently developed in the Sierra Vista area would not recover completely in 100 years.

River flows, however, continue to decline from an annual average of 42.7 cfs at Charleston in 1988 to 41.5 cfs in 2088. At Fairbank the modeled 1988 flow was 44.8 cfs compared with 43.6 cfs in 2088. ..."¹²⁷

¹²⁵ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

¹²⁶ Biological Opinion on impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca (Fort), Arizona.; AESO/SE 2-21-02-F-229, 2-21-98-F-266, U.s. Fish and Wildlife Service, August 23, 2002.

¹²⁷ SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994; pages 13-14.

Graphs from WESTEC 1994 dramatically illustrate the fact that even if all groundwater pumping is stopped, the lowering of the water table continues towards the San Pedro River continuing the capture of groundwater that would otherwise supply surface water to the River:

Figure B-1

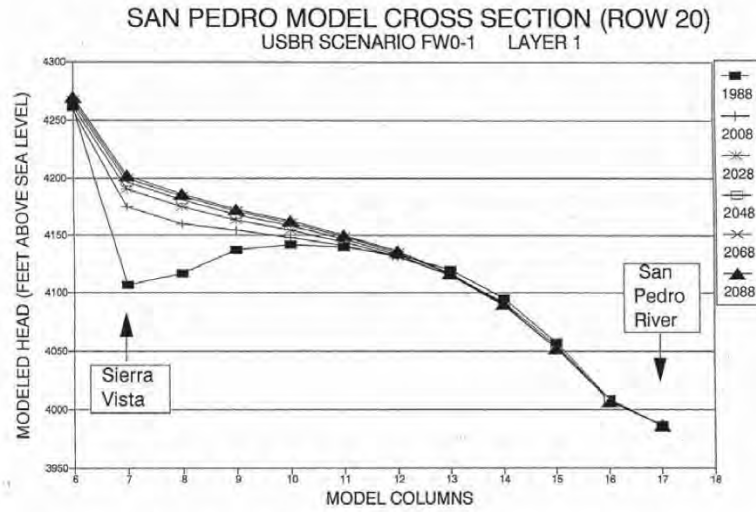
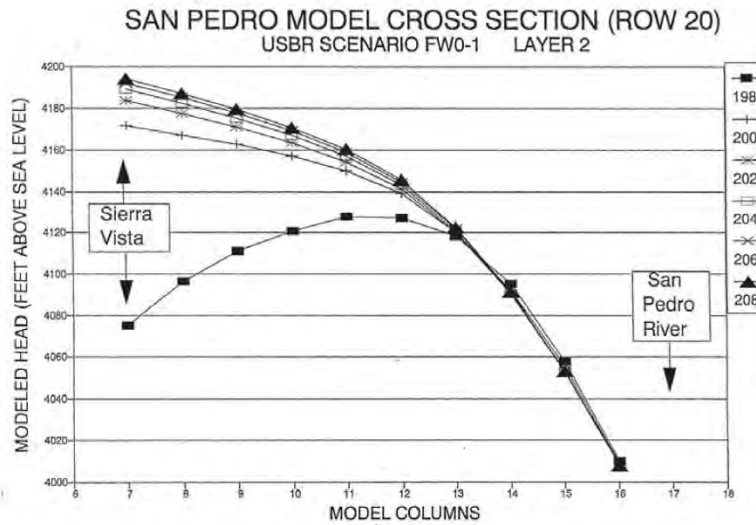


Figure B-2



The BiOp does tangentially mention pre-BiOp pumping effects,

"... groundwater withdrawals from all wells in the Upper San Pedro Basin from 1940 to 2003 are estimated to have caused the regional groundwater part of baseflow to decline 1 to 2 cfs in the Babocomari River. Declines in the regional groundwater component of baseflow in the Babocomari would have downstream effects in the San Pedro River at the Tombstone gage (PBA Section 3.5.3). The modeled San Pedro River baseflow at the Tombstone gage is calculated to have declined by 2 to 3 cfs due to groundwater withdrawals. ..." BiOp at 76.

The BiOp, however, does not assign pre-BiOp numbers and Fort Huachuca-attributable ownership to the withdrawals that caused the regional groundwater part of the baseflow to decline in the Babocomari and San Pedro Rivers.

In 2009, prior to production of the BiOp, Bredehoeft and Durbin (2009) address the phenomenon of the effects of groundwater pumping even after the pumping has been terminated. Bredehoeft and Durbin's "Ground Water Development – The Time to Full Capture Problem," says,

"The maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops. This is especially true if the monitoring is some distance away from the pumping. In addition, ground water systems will be very slow to recover to their predevelopment state once pumping is stopped. ...

If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."¹²⁸

Bredehoeft and Durbin (2009) are mentioned in the BiOp's PBA, but the PBA at G-13-14 attempts to deceptively use Bredehoeft and Durbin (2009)'s acknowledgement of "time-lag" to justify an artificially, and inappropriately abbreviated twenty-year planning and modeling period "for federal government activities":

"... modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River."

We addressed the fallacy of basing anything on a State of Arizona policy earlier; however, here we will address the BiOp's deceptive, intentional, misinterpretation of Bredehoeft

¹²⁸ "Ground Water Development – The Time to Full Capture Problem," j. Bredehoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x; 2009.

and Durbin (2009). Simply said, what Fort Huachuca conveniently fails to disclose is that the "time-lag" from Bredehoeft and Durbin (2009) is VERY long, not 18 years.

To illustrate from Bredehoeft and Durbin (2009) that "[t]he maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops," Bredehoeft and Durbin include Figure 9:

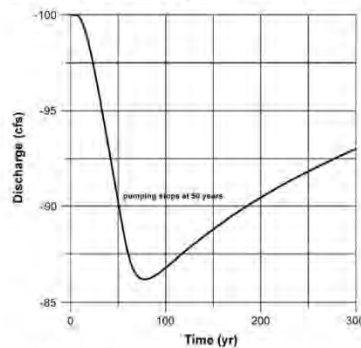


Figure 9. Predicted spring flow from a hypothetical aquifer (Figure 1 with phreatophytes in area 1 replaced by a spring). Pumping ceases after 50 years when the spring flow drops to 90 cfs.

Describing Figure 9, Bredehoeft and Durbin say,

"Figure 9 shows the discharge of our spring vs. time; pumping stopped in area 1 in approximately 50 years when the spring discharge dropped to 90 cfs. The minimum spring flow occurs at approximately 75 years, 25 years after we stopped pumping. The reduction in flow is 13 cfs—larger than what it was when we stopped pumping. The maximum drawdown at the spring, created by the pumping, takes 25 years after pumping stops to work its way through the system. We also see that the system does not recover readily to its predevelopment state even though the spring discharge equaled the recharge and was 100 cfs. Perhaps this is best understood if we look at the water removed from storage by the pumping and the rate at which it is replenished. During the period of pumping, the spring flow drops more or less linearly from 100 to 90 cfs. The amount of water removed from storage during this period averages approximately 95 cfs. The reduction in spring discharge averaged 5 cfs over the 50-year period—the capture of spring discharge averaged 5 cfs over the period. In other words, 95% of the ground water pumped during the 50 years of pumping came from storage. During the remaining 250 years since pumping stopped, the spring discharge averaged approximately 90 cfs. During that period, we are putting back in storage, on average, 10 cfs. This means that during the 250 years since the pumping ceased, we have restored just more than 50% of the water that was removed from the storage during the pumping period. You can easily see that this simple system will take approximately 500 years to return to its original state.

This hypothetical model illustrates the monitoring problem. If the monitoring point is some distance removed from the pumping, there will be (1) a time lag between the maximum impact and the stopping of pumping and (2) the maximum impact will be greater than what is observed when pumping is stopped (unless one has reached a

new equilibrium state during the pumping period). The time for full recovery of the system will be long, even in the case where one has not reached the new equilibrium.

The real world is more complex. Those that advocate monitoring seldom envision totally stopping the pumping; rather, they imagine changes in the development that minimize damages. Stopping the pumping is a management action of last resort and we showed that it has problems. Less stringent management actions have a correspondingly lesser beneficial impact and even more problems."

Bredehoeft and Durbin (2009) use the Southern Nevada Water Authority's ("SNWA's") desire to pump groundwater in eastern Nevada as the subject of their report. In their final discussion, Bredehoeft and Durbin (2009) say,

"We do not think that the SNWA development in Nevada is all that unique nor do we think that this is typically only a western problem. Large aquifer systems exist throughout the country and the world. The response time problem is typical of large systems; there are other developments where the hydrologic boundaries where capture can take place are far from the pumping. Long times will be involved before the system can reach a new equilibrium ..."

Bredehoeft and Durbin (2009) conclude,

"Some ground water systems in which a new equilibrium state that includes pumping can be achieved may take a long time to reach the new equilibrium. This is especially true where the discharge from the system that can potentially be captured by the pumping is a long distance away from the pumping center. Such a system may take more than a millennium, some more than two millennia, to reach the new equilibrium state. ... If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."

A "millennium" is quite a bit longer than the BiOp's PBA excerpting from Bredehoeft and Durbin (2009) "that there is a time-lag for groundwater systems" as justification for an extra 18 years of modeling as the BiOp's "simulations use the modeling period from 2003-2030."

In 2012, USGS authors Barlow and Leake discuss the time lag of the effects of groundwater pumping after stopping the pumping in even more detail. In "Stream flow depletion by wells – Understanding and managing the effects of groundwater pumping on streamflow," Barlow and Leake state:

"Common Misconceptions about Streamflow Depletion

An understanding of the basic concepts of streamflow depletion is needed to properly assess the effects of groundwater withdrawals on connected surface water and areas of evapotranspiration. Important concepts relating to depletion are available throughout this report and also in other literature, beginning with the paper, "The Source of Water Derived from Wells," by Theis (1940). In spite of these sources of information, misconceptions regarding factors controlling depletion are sometimes evident in analyses of depletion. This discussion highlights the following common misconceptions related to streamflow depletion. ...

Misconception 3. Depletion stops when pumping ceases. ...

Depletion after Pumping Stops

When a well begins to pump, water is removed from storage around the well, creating a cone of depression. As discussed previously, the cone of depression expands and can increase recharge to and discharge from the aquifer. If a well pumps groundwater for a period of time and then pumping ceases, groundwater levels will begin to recover and the cone of depression created by the pumping will gradually fill, with water levels eventually reaching positions that existed before pumping started (fig. 32). During the time that the cone of depression is filling, groundwater that otherwise would have flowed to streams instead goes into aquifer storage; thus, streamflow depletion is ongoing, even though pumping has ceased. The factors that control the rate of recovery are the same as those that affect the rate of groundwater-level declines in response to pumping—the geology, dimensions, and hydraulic conditions along the boundaries of the groundwater system, including the streams, and the horizontal and vertical distance of the well from the stream. ...

Some key points relating to depletion from a well or wells that pump and then stop pumping are as follows:

1. Maximum depletion can occur after pumping stops, particularly for aquifers with low diffusivity or for large distances between pumping locations and the stream.
2. Over the time interval from when pumping starts until the water table recovers to original pre-pumping levels, the volume of depletion will equal the volume pumped. ...
6. In many cases, the time from cessation of pumping until full recovery can be longer than the time that the well was pumped. ..."

Conclusions ...

Streamflow depletion after pumping stops: Streamflow depletion continues after pumping stops because it takes time for groundwater levels to recover from the previous pumping stress and for the depleted aquifer defined by the cone of depression to be refilled with water. The time of maximum streamflow depletion often may occur after pumping has stopped. Eventually, the aquifer and stream may return to their pre-pumping conditions, but the time required for full recovery may be quite long and exceed the total time that the well was pumped. Over the time interval from when pumping starts until the system fully recovers to its prepumping levels, the volume of streamflow depletion will equal the volume of water pumped. ..."¹²⁹

Besides inappropriately narrowing the evaluation window by deliberately misrepresenting the "time-lag" from Bredehoeft and Durbin (2009), the BiOp completely ignores that "the volume of depletion will equal the volume pumped," and "the volume of streamflow depletion will equal the volume of water pumped" from Barlow and Leake (2012). The BiOp fails to present and evaluate the total amount of pre-BiOp groundwater pumping attributable to Fort Huachuca that is still negatively impacting the San Pedro.

¹²⁹ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>.

In addition to GeoSystems (2010) pre-BiOp pumping documentation and modeling ignored in the BiOp discussed above, Fort Huachuca had other information documenting the amount of pre-BiOp groundwater pumping. Fort Huachuca's own "Statement of Claimant Form for Other Uses Amendment Superior Court of Maricopa County Federal Reserved Water Rights" says,

"Well pumpage from 1963 to 1984 has averaged 2,762 acre-feet per fiscal year. From 1982 to 1989 well production has averaged 2,830 acre-feet per calendar year"¹³⁰.

TABLE 5-58
FORT HUACHUCA
WELL PRODUCTION
(ACRE-FEET)

FISCAL YEAR		CALENDAR YEAR	
1963	2,887	1982	2,736
1964	2,471	1983	2,876
1965	2,636	1984	3,071
1966	2,703	1985	2,986
1967	3,021	1986	2,898
1968	2,909	1987	2,273 (excludes December)
1969	3,262	1988	3,021
1970	3,319	1989	2,601 (excludes October-December)
1971	3,174		
1972	3,148		
1973	2,781		
1974	3,351		
1975	2,597		
1976	2,766		
1977	2,871		
1978	2,327		
1979	2,624		
1980	2,836		
1981	2,996		
1982	2,597		
1983	2,928		
1984	3,105		

Source: Fort Huachuca letter concerning statements of claimant 39-10774 and 39-10775. October 17, 1989, enclosure 6, revised figures.

As we presented and discussed in the preceding section, Fort Huachuca's contractor, GeoSystems (2010) showed that the cumulative debt amount of pre-BiOp Fort-attributable on-post groundwater pumping 1950-2002 totals approximately 150,090 acre-feet¹³¹ and the on-post and off-post Fort-attributable groundwater pumping debt in 2002 totals approximately 300,000 acre-feet.¹³² This cumulative groundwater debt is not addressed and is not included in the BiOp

¹³⁰ Statement of Claimant Form for Other Uses' Amendment, Claimant Name: U.S. Army Intelligence Center and Fort Huachuca; Federal Reserved Water Rights; January 16, 2002.

¹³¹ GeoSystems (2010), Figure 3.

¹³² GeoSystems (2010), Figure 13.

evaluation. This omission from the BiOp violates the legal mandate to use the best available science.¹³³

E. **The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow.**

Such a concurrence fails to note FWS' own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,¹³⁴ Pupfish,¹³⁵ Spikedace¹³⁶ and Loach Minnow.¹³⁷



Loach Minnow (*Tiaroga cobitis*)

© Robin Silver

FWS' Recovery Plan for Loach Minnow states,

"Loach minnow is endemic to the Gila River basin of Arizona and New Mexico... Distribution in Arizona included the ... San Pedro River ... plus major tributaries...

Among streams from which loach minnow have been extirpated, Eagle Creek and San Pedro River, Arizona, represent those most amenable to reestablishment of the species. ... San Pedro River is the type locality for loach minnow (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for

¹³³ 16 U.S.C. § 1536(a)(2); *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

¹³⁴ Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii extimus*), USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

¹³⁵ Desert Pupfish (*Cyprinodon maularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

¹³⁶ Spikedace (*Meda fulgida*) Recovery Plan, USFWS, September 1991.

¹³⁷ Loach Minnow (*Tiaroga cobitis*) Recovery Plan, U.S. Fish and Wildlife Service, September 1991.

loach minnow; certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) also have potential for reestablishment of the species."¹³⁸



Spikedace (*Meda fulgida*)

© Robin Silver

FWS' Recovery Plan for Spikedace states,

"The species was abundant in the San Pedro River, Arizona ... Among streams from which spikedace have been extirpated, the San Pedro River system, Arizona, probably represents the most amenable, for several reasons, to its reestablishment. San Pedro River is the type locality for spikedace (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Eberhardt 1981, Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for spikedace, but also certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) may have potential for reestablishment of the species. ..."¹³⁹

¹³⁸ Ibid.

¹³⁹ Spikedace, *Meda fulgida*, Recovery Plan, prepared by Paul C. March, Arizona State University, Tempe, Arizona for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 30, 1991.



Desert Pupfish (*Cyprinodon macularius*)

© Robin Silver

FWS' Recovery Plan for Desert Pupfish states,

"Desert pupfish historically occupied the Gila River basin below about 1,500 meters (m) elevation in Arizona and Sonora, including the Gila, Santa Cruz, San Pedro, and Salt Rivers...

Re-established populations in Arizona will be located in the ... San Pedro...

The San Pedro River (BLM Riparian National Conservation Area, Cochise County, Arizona) should be considered a priority re-establishment site (as already recommended by Minckley (1987) for desert pupfish plus other extirpated native fishes), because it has high potential and is the type locality for the species. ..."¹⁴⁰

¹⁴⁰ Desert Pupfish (*Cyprinodon macularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.



Southwestern Willow Flycatcher (*Empidonax traillii extimus*) © Jim Burns

FWS' Recovery Plan for Southwestern Willow Flycatcher states,

" The historical range of the flycatcher in Arizona included portions of all major watersheds (H. Brown 1902 unpubl. data, Willard 1912, Swarth 1914, Phillips 1948, Unitt 1987). ... All of Arizona's major rivers and their tributaries where southwestern willow flycatchers were known to have bred have changed, often dramatically (Tellman et al. 1997). Rivers such as the Colorado, Gila, Santa Cruz, San Pedro, and Verde rivers have suffered extensive dewatering, and loss and fragmentation of riparian habitats. ...

Specific river reaches, within Management Units, where recovery efforts should be focused. Substantial recovery value exists in these areas of currently or potentially suitable habitat ... San Pedro River from international border to St. David (AZ) ..."¹⁴¹

It is not logical to conclude that Fort Huachuca will have no effect on species dependent upon the San Pedro for recovery when Fort Huachuca itself and its Base-attributable deficit groundwater pumping are jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

¹⁴¹ Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup, Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico; August 30, 2002.

F. **Fort Huachuca has failed to reinitiate consultation and FWS has failed to adopt its conference opinions following the listing of the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo.**

Since release of the BiOp, the Northern Mexican Gartersnake has been added to the federal list of endangered species. On July 8, 2014, the Northern Mexican Gartersnake was added to the federal list of endangered species.¹⁴²



Northern Mexican Gartersnake (*Thamnophis eques megalops*) © Andy Holycross

FWS' Listing Notice for Northern Mexican Gartersnake states,

"Records documenting northern Mexican gartersnake exist within the following subbasins in Arizona: ... San Pedro River ...

Despite the loss or modification of aquatic and riparian habitat, large reaches of the ... San Pedro ..., as well as several of their tributaries, remain functionally suitable as physical habitat for either gartersnake species [both the Northern Mexican Gartersnake and the Narrow-headed Gartersnake were listed in the same Notice]. ...

The arid southwestern United States is characterized by limited annual precipitation, which means limited annual recharge of groundwater aquifers; even modest changes in groundwater levels from groundwater pumping can affect above-ground stream flow as evidenced by depleted flows in the ... San Pedro ... as a result of regional groundwater demands (Stromberg *et al.* 1996, pp. 113, 124–128; Rinne *et al.* 1998, p. 9; Voeltz 2002, pp. 45–47, 69–71; Haney *et al.* 2009 p. 1). Groundwater

¹⁴² Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

demands are expected to reduce surface water flow in ... Babocomari River ... [and] San Pedro River ... over the next several decades (Haney *et al.* 2009 p. 3, Table 2) ...

Further south in Arizona, portions of the once-perennial San Pedro River are now ephemeral, and water withdrawals are a concern for the San Pedro River (USGS 2013, p. 3). ...

Along the upper San Pedro River, Stromberg *et al.* (1996, pp. 124–127) found that wetland herbaceous species, important as cover for northern Mexican gartersnakes, are the most sensitive to the effects of a declining groundwater level. Webb and Leake (2005, pp. 302, 318–320) described a correlative trend regarding vegetation along southwestern streams from historically being dominated by marshy grasslands preferable to northern Mexican gartersnakes, to currently being dominated by woody species that are more tolerant of declining water tables due to their deeper rooting depths. The cone of depression associated with regional groundwater pumping is expected to continue expanding its influence on surface flow in the San Pedro River over the next several decades, which is expected to further reduce surface flow in the river and negatively affect riparian vegetation (Stromberg *et al.* 1996, pp. 124–128).

In our evaluation of the effect of groundwater pumping on gartersnake habitat, we found several references that discuss the known hydrological connection between groundwater and surface flow in southwestern streams. This is an established concept in the scientific community and the basis for widespread public concern in several areas of Arizona with respect to surface flows including the Verde and San Pedro Rivers. ...¹⁴³

The law requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize survival and recovery of the Northern Mexican Gartersnake.¹⁴⁴ Fort Huachuca has not done so in spite of the fact that the Base's activities are jeopardizing the survival and recovery of this species. Fort Huachuca's failure to consult with FWS to prevent jeopardizing the Northern Mexican Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Since production of the BiOp, the Yellow-billed Cuckoo has been added to the federal list of endangered species. On October 3, 2014, the Yellow-billed Cuckoo was added to the federal list of endangered species.¹⁴⁵

¹⁴³ Final rule. Endangered and Threatened Wildlife and Plants: Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

¹⁴⁴ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

¹⁴⁵ Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.



Yellow-billed Cuckoo(*Coccyzus americanus*) © Robin Silver

The largest population of Yellow-billed Cuckoo in the western United States.¹⁴⁶
"Perhaps 30 percent of the western U.S. population of Yellow-billed Cuckoos breed" in the San Pedro Riparian National Conservation Area."¹⁴⁷ At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River.¹⁴⁸

FWS' Listing Notice for Yellow-billed Cuckoo states:

"Upper San Pedro River—This site has had the largest yellow-billed cuckoo population in Arizona. ...

The San Pedro Riparian National Conservation Area (NCA) encompasses approximately 40 mi (64 km) of the upper San Pedro River meanders. It was designated by Congress in 1988 with its primary purpose to protect and enhance the desert riparian ecosystem as an example of what was once an extensive network of similar riparian systems throughout the American Southwest. It contains nearly 57,000 ac (23,077 ha) of public land between the international border with Mexico and St. David, Arizona, and supports one of the largest western yellow-billed cuckoo populations in Arizona. However, continually increasing demands for water use within the basin threatens future flow in the upper San Pedro River. The 2011 District of Arizona case, *Center for Biological Diversity, et al. v. Kenneth Salazar, et al.*, CV 07-484- TUC—AWT, ruled that the 2007 plan by the U.S. Army and U.S. Fish and Wildlife Service failed to protect the upper San Pedro River or properly analyze Fort

¹⁴⁶ Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.; Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

¹⁴⁷ National Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine, Vol. 104, No. 5; December 2002.

¹⁴⁸ Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.

Huachuca's ground water pumping effect on the ecosystem's endangered species and critical habitat."¹⁴⁹

The proposal for Critical Habitat for Yellow-billed Cuckoo says:

"This unit [Upper San Pedro River] has one of the largest remaining breeding groups of the western yellow-billed cuckoo and is consistently occupied by a large number of pairs. The site also provides a movement corridor for Western yellow-billed cuckoos moving farther north."¹⁵⁰

The law requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize survival and recovery of the Yellow-billed Cuckoo.¹⁵¹ Fort Huachuca has not done so in spite of the fact that the Base's activities are jeopardizing the survival and recovery of this species. Fort Huachuca's failure to consult with FWS violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Section 7(a)(4) mandates that an action agency "confer" with FWS on any action that is "likely to jeopardize the continued existence" of any "species proposed to be listed" or is "likely to result in the destruction or adverse modification of critical habitat proposed to be designated for such species." 16 U.S.C. § 1536(a)(4); 50 C.F.R. § 402.10. Although not required, agencies can request that the conference "be conducted in accordance with the procedures for formal consultation." 50 C.F.R. § 402.10(d). The final product of such a conference is called a conference opinion. Consultation Handbook at 6-4.

If a proposed species is later listed, or its critical habitat is formally designated, the action agency has two options. First, it can request in writing that FWS adopt the conference opinion as a BiOp. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-6. However, FWS may only adopt the opinion so long as "no significant new information is developed . . . and no significant changes to the Federal action are made." If the opinion is adopted as a BiOp, any incidental take statement that was provided with the conference opinion may take effect—but not before then. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-4. If FWS does not adopt the conference opinion as a BiOp, the action agency *must* pursue its second option and reinitiate consultation pursuant to 50 C.F.R. § 402.16(d) (requiring reinitiation of formal consultation if a "new species is listed or critical habitat designated that may be affected by the identified action"); *see also* BiOp at 369 (noting "reinitiation of formal consultation is required where . . . a new species is listed or critical habitat designated that may be affected by this action"). Either way, formal consultation is not concluded until FWS issues a BiOp. 50 C.F.R. § 402.14(1)(1).

Here, when FWS issued the Fort Huachuca BiOp and Conference Opinion on May 16, 2014, the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo were proposed for listing, and FWS had proposed critical habitat for the Gartersnake. FWS incorporated conference opinions for these species into its BiOp, along with a provisional incidental take statement for the gartersnake. BiOp at 252, 276–80. Less than two months later, FWS published a final rule listing the gartersnake as threatened. Endangered and Threatened Wildlife and

¹⁴⁹ Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule, U.S. Fish and Wildlife Service, Federal Register Vol. 78 Page 61622, October 3, 2013.

¹⁵⁰ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo; Proposed Rule; U.S. Fish and Wildlife Service; Federal Register Vol. 79 Page 48548.

¹⁵¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

Plants; Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, 79 Fed. Reg. 38,678 (July 8, 2014). Shortly thereafter, FWS also listed the western distinct population segment of the Yellow-billed Cuckoo as threatened. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), 79 Fed. Reg. 59,992 (Oct. 3, 2014).

By the end of 2014, the Fort requested that FWS adopt the conference opinions for the Gartersnake and Cuckoo as a BiOp. Phone call with FWS Tucson Field Office (July 16, 2019). But although the Consultation Handbook gives FWS 45 days after an action agency's request to adopt a conference opinion as a BiOp, here FWS has not acted in nearly five years. Consultation Handbook at 6-6. Enough time has passed since the Fort's request for FWS confirmation—roughly 1,800 days—that FWS can no longer be certain that “no significant changes have occurred in the proposed action or the information used in the conference.” *Id.*; see also Alex Devoid, *A rancher and an ecologist hike the desert, hunting for water and common ground on the San Pedro River*, Arizona Republic, Jan. 7, 2019¹⁵² (reporting a long-term drought in the San Pedro region, making 2018 one of the three driest rivers for the Babocomari since mapping began in 2007). Moreover, the Fort never reinitiated consultation pursuant to 50 C.F.R. § 402.16(d), as it should have based on the length of time that has passed since the species were listed. A new interagency consultation for the Gartersnake and Cuckoo is the only way to assess the Fort's impacts to these species' continued existence. See *id.*

In sum, the agencies have failed to complete formal consultation on an action which the Fort already recognized may adversely affect both the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo. PBA at 5-28, 5-39. Moreover, because the 2014 conference opinions were never confirmed, the provisional incidental take statement issued for the gartersnake never took effect. See BiOp at 276–79; 50 C.F.R. § 402.10(d). This means the Fort has been operating for five years in a manner FWS already recognized would likely result in the take of ten Northern Mexican Gartersnakes over the course of the 10-year action period. See BiOp at 276 (issuing provisional incidental take statement for ten Northern Mexican Gartersnakes over the 10-year life of the project due to baseflow reductions in the lower Babocomari). Even assuming the Fort has not already violated section 9's take prohibition, the Fort's failure to consult violates section 7 of the ESA, 50 C.F.R. § 402.10(d), and 50 C.F.R. § 402.16(d).

G. Recharge Basins are not providing as much water as anticipated in the BiOp. New Climate Change science since release of the BiOp means that even less recharge can be anticipated. This new information requires Reinitiation of Consultation.

Fort Huachuca claims credit from a series of on-post recharge basins in the BiOp (at 168) for Stormwater Capture ("C2") and East Range recharge ("C3") (BiOp at 168), and claims credit off-post for the Palominas Pilot Stormwater Recharge Project ("F2") (BiOp at 169); however, the recharge basins are not providing the amount of recharge as planned.¹⁵³ The BiOp

¹⁵² Available at <https://www.azcentral.com/story/news/local/arizona-environment/2019/01/07/looking-common-ground-ailing-san-pedro-river-arizona/2447483002/>.

¹⁵³ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date

at 168 claims 108 acre-feet per year from 2013 – 2022 for on-post Stormwater Capture ("C2"); however, Fort Huachuca's Annual Reports show totals of 61.6, 59, 27, and 27 acre-feet per year respectively for years 2015, 2016, 2017, and 2018.¹⁵⁴ This represents 60% less recharge for the last four years than anticipated in the BiOp for on-post credit for Stormwater Recharge.

The BiOp at 168 claims 368 acre-feet per year for on-post East Range Recharge ("C3") from 2013-2022; however, Fort Huachuca's Annual Reports show totals of 185, 187, 209, 155, and 246 for years 2015, 2016, 2017, and 2018, respectively.¹⁵⁵ This represents 47% less recharge for the last five years than anticipated in the BiOp for on-post East Range Recharge credit.

The BiOp at 30 and 169 counts the off-post Palominas Pilot Stormwater Project ("F2") for 98 acre-feet per year starting in 2015; however, the June 19, 2019, Cochise Conservation and Recharge Network report to the USPP Technical Committee reveals that the Palominas Recharge facility recharged only 9.7 and 10.2 acre-feet per year respectively in years 2017 and 2018.¹⁵⁶ This represents 90% less recharge for the two years for which data is available than anticipated in the BiOp for the Palominas Recharge facility.

According to the best available climate, the recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and mentioned here, and ultimately, also "Incidental Recharge" claimed by the Base (BiOp at 168), will be diminished further in the future.¹⁵⁷ The American Southwest is getting hotter and drier.¹⁵⁸ Climate models project that precipitation and soil moisture in the

unknown; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

¹⁵⁴ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

¹⁵⁵ Ibid.

¹⁵⁶ Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

¹⁵⁷ Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN.; Scager, R., T. Mingfang, L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: 482-486.

¹⁵⁸ Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45 (pp. 186-190); Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (pp.231, 238).

Southwest will continue to decrease.¹⁵⁹ Global warming driven by rising greenhouse-gas concentrations is expected to cause a steady drop in precipitation over the American Southwest by 2040 leading to declines in surface water availability.¹⁶⁰

Arizona generally has already become both hotter and drier.¹⁶¹ Specifically, in nearby Tucson, where substantial data is available, year-round temperatures are increasing and precipitation is diminishing.¹⁶²

H. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area¹⁶³ will be increasing by 61.9 % since the BiOp from -1,453 acre-feet per year¹⁶⁴ to approximately -2,325.2 acre-feet per year.¹⁶⁵ This new information requires reinitiation of consultation.

Fort-attributable, San Pedro River-damaging deficit groundwater pumping has significantly increased since the BiOp. Since production of the BiOp, the San Pedro's vulnerability and risk of harm from the Base's pumping has increased dramatically as Fort Huachuca-attributable, unmitigated, deficit groundwater pumping is now 1,172 acre-feet per year greater, 61.9% greater, than the amount assumed in the BiOp.¹⁶⁶ BiOp at 141, 160, 163, 169, and 304.

¹⁵⁹ Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J011993CC (p. 217); Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0C18BNN (pp. 231, 238).

¹⁶⁰ Seager, R., T. Mingfang, L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: p. 482.

¹⁶¹ National Oceanic and Atmospheric Administration National Centers for Environmental information, City Time Series, published October 2019, retrieved on October 22, 2019 from <http://www.nedc.noaa.gov/cag/>.

¹⁶² Ibid.

¹⁶³ Sierra Vista Subbasin.

¹⁶⁴ BiOp at 80, 85, 154, and 169.

¹⁶⁵ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin". Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁶⁶ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin". Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.; Wells 55 Registry, downloaded from

The BiOp bases its water budget upon a net yearly Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) This deficit of 4,600 acre-feet/year comes from the Upper San Pedro Partnership ("USPP") report from 2013.¹⁶⁷ BiOp at 141 and 160.

USPP is "[a] consortium of agencies and organizations working together to meet the long-term water needs of the Sierra Vista Subwatershed by achieving sustainable yield of the regional aquifer to: 1) preserve the San Pedro Riparian National Conservation Area (SPRNCA), and 2) ensure the long-term viability of Fort Huachuca."¹⁶⁸ Fort Huachuca is a USPP member.

In 2003, USPP promised to "balance the local water budget by 2011"¹⁶⁹ in order to secure a special legislative environmental law exemption for Fort Huachuca¹⁷⁰ to protect the base from downsizing in the 2005 Base Realignment and Closure round. The legislative exemption was necessary at the time because, in Fort Huachuca's lawyer's own words,

"Development over the last decade has overburdened water resources. The region is now facing an escalating groundwater deficit, with underlying aquifer being drained beyond its capacity for recharge. Declining water levels are adversely affecting critical habitat and several endangered species in the San Pedro Riparian Area. ...

In 1998, the USFWS issued a draft BO, which preliminarily concluded that the Army's proposed action (Fort Huachuca's ongoing and programmed activities and accompanying conservation measures), were "likely to jeopardize" the existence of the Huachuca Water Umbel, the Southwestern Willow Flycatcher and "likely to adversely modify" the critical habitat of the Flycatcher [Yellow-billed Cuckoo, and Northern Mexican Gartersnake were not yet listed as endangered]. ...

On 11 April 2002, the U. S. District Court, District of Arizona, issued an order granting CBD's motion for summary judgment/declaration judgment, finding the absence of a factual and rational basis to support the no-jeopardy BO ("The Defendants [Army and USFWS] admit that even if all of the mitigation measures included in the Final BO, are taken together and under the best case scenario, water use in the aquifer will exceed supply and result in continuing growth in the already very large cone of depression under Fort Huachuca and Sierra Vista, until groundwater pumping is balanced in the region." (Court's Opinion at pages 16-17). The court ruled that the USFWS must address the regional water deficit and impose specific mitigation measures (Reasonable and Prudent Alternatives) on Fort Huachuca designed to achieve a no-jeopardy situation. ...

Representative Renzi's amendment to H.R. 1835 proposes to limit the consideration of civilian, off-post water in future ESA consultations conducted by

<https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁶⁷ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.

¹⁶⁸ <http://uppersanpedropartnership.org/mission-goals/>

¹⁶⁹ "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

¹⁷⁰ Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

military installations. It is unclear whether the scope of this amendment is broad enough to preclude the consideration of "cumulative effects," which are future state and private activities, not part of the federal action that are reasonably certain to occur. Having to consider and mitigate for cumulative effects under the ESA continues to be a major problem for Fort Huachuca."¹⁷¹

With Senator John McCain's help,¹⁷² Representative Rick Renzi was able to secure passage of the special legislative environmental law rider exemption for Fort Huachuca so that the Base would not have to consider the surrounding area's environmental baseline in any evaluation of Fort Huachuca's activities.¹⁷³ But as a quid quo pro for passage of the legislative exemption, USPP, including Fort Huachuca, promised to "balance the area's water deficit by 2011."¹⁷⁴

The September 13, 2003, Sierra Vista Herald's "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit" reports:

"In the resolution, the group, which is a consortium of federal, state and local agencies, businesses and environmental groups, says its members will balance the area's water deficit by 2011... The object of the resolution is to ensure the fort has the support it needs to survive the next Base Realignment and Closure round.

"Strain [Sierra Vista mayor pro tem Bob Strain], the chairman of the partnership's Advisory Commission, said that can only be done with a commitment by the off-post communities to be part of the water use solution."

Fort Huachuca's Garrison Commander stressed the importance of balancing the area's water deficit by 2011 in the Sierra Vista Herald on February 4, 2006. In "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

"FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

¹⁷¹ "INFORMATION PAPER; SUBJECT: District Court Decision on Fort Huachuca's Biological Opinion; Purpose: To provide information on the 11 April 2002, U.S. District Court decision regarding the U.S. Fish and Wildlife Service's (USFWS) Final Biological Opinion (BO) on Fort Huachuca's activities and water usage."; Colonel Teller, JALS-EL 12 May 2003.

¹⁷² Op Ed: "Republicans should save environment," John McCain, November 27, 1996:

"Public skepticism that Republican share Americans' environmental values raise an important question. Have Republicans abandoned their roots as the party of Theodore Roosevelt, who maintained that government's most important task, with the exception of national security, is to leave posterity a land in better condition than they received it?

The answer must be no. But if we are to restore the people's trust and retain the privilege of serving as the majority party, we better start improving it. ... Too often the public views Republicans as favoring big business at the expense of the environment ... killing the patient is a lousy way to treat the disease and squanders our credentials as reformers while adding substance to our critics' accusations of extremism. ... our nation's continued prosperity hinges on our ability to solve environmental problems and sustain the natural resources on which we all depend."

Press Release, "Statement of Senator John McCain Bill to Authorize Two Base Realignment Closure Rounds to Occur in 2003 and 2005," Senator John McCain, August 23, 2002 and November 4, 2002:

"I urge my colleagues to join us in support of this critical bill and to work diligently throughout the year to put aside local politics for what is clearly in the best interest of our military forces.";

¹⁷³ Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

¹⁷⁴ "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ...

Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.

While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.

What is unrecognized by many is "we didn't do well in some areas," Hunter said.

One area of concern of water...

With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said.¹⁷⁵

USPP reiterated its promise in its 2005 through 2011 reports:

"...the Secretary of the Interior shall prepare, in consultation with the Secretary of Agriculture and the Secretary of Defense and in cooperation with the other members of the Partnership, a report on water use management and conservation measures that have been implemented and are needed to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011."¹⁷⁶

¹⁷⁵ "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 6, 2004.

¹⁷⁶ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2004 Report to Congress, Upper San Pedro Partnership, March 30, 2005.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2005 Report to Congress, Upper San Pedro Partnership, 2006.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2006 Report to Congress, Upper San Pedro Partnership, 2007.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2007 Report to Congress, Upper San Pedro Partnership, 2008.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2009 Report to Congress, Upper San Pedro Partnership, May 2011.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2010 Report to Congress, Upper San Pedro Partnership, May 2012.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

Predictably, though, the Upper San Pedro Partnership, including Fort Huachuca, failed to keep its promise to “balance the local water budget by 2011.” In their 2012 report (USPP 2014), USPP admits:

“...the Partnership has fallen short of the goal set by Congress to achieve sustainable yield (defined by the Partnership as erasing the water budget deficit) by September 30, 2011.”¹⁷⁷

The BiOp states that “[t]he Fort is no longer contributing to the groundwater deficit.” (BiOp p. 166, 275.) This statement is false.

The Fort-attributable, unmitigated, deficit groundwater pumping in the BiOp is -1,453 acre-feet per year for 2011 (BiOp at 80,85, 154, and 169). And this inappropriately includes 299 acre-feet per year credit for “avoided future pumping” for the Babocomari Area Conservation Easement (BiOp at 28, 168) The new Fort-attributable deficit since the BiOp is now approximately 2,325.2 acre-feet per year.¹⁷⁸ This is now -1,172 acre-feet per year greater than the amount assumed in the BiOp,¹⁷⁹ (BiOp at 141, 160, 163, 169, and 304) which is an increase of at least 61.9% in unmitigated, deficit groundwater pumping since production of the BiOp.

The BiOp assumes a Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) The BiOp subsequently arrives at its Fort-attributable deficit groundwater pumping of -1,453 acre-feet per year (BiOp at 80,85, 154, and 169). The BiOp’s total of -1,453 acre-feet per year, however is not accurate as the BiOp inappropriately assigns the Base credit for 299 acre-feet per year from “avoided future pumping” for the Babocomari Area Easement. BiOp at 169 and Biological Assessment (“BA”) Appendix D Mitigation Measures Plan at 2. The BiOp credits Fort Huachuca with the 299 acre-feet per year for the Babocomari Area as it is from “avoided future pumping” for the Babocomari Area Easement in spite of the fact that the BiOp at 294, itself, states that “[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired.”¹⁸⁰ Consequently, the correct 2011, Fort-attributable, unmitigated groundwater pumping should have been -1,752 acre-feet per year in the BiOp. ($1,453 + 299 = 1,752$). The new Biological Opinion will need to correct this error.

¹⁷⁷ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

¹⁷⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company’s Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply, 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, “Groundwater Subbasin”, downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁷⁹ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company’s Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply, 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, “Groundwater Subbasin”. Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017..

¹⁸⁰ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. (“BiOp”), page 294.

USPP (2014) reports that the area's total aquifer overdraft is -5,100 acre-feet per year.¹⁸¹ This is higher than the BiOp's total aquifer overdraft of -4,600 acre-feet per year from USPP (2013). The BiOp's hydrological data is from "2011, 2012, and preliminary numbers from 2013." (BiOp at 4.) The USPP report (2014) is based on data through 2012.

In addition, since release of USPP (2014), an additional 3,302.35 acre-feet per year of future groundwater extraction for the build out of the proposed 7,000 house, Pueblo del Sol Tribute development in Sierra Vista has been approved by the City of Sierra Vista and the Arizona Department of Water Resources ("ADWR");¹⁸² and an additional 369 new non-monitoring wells have been permitted in the Sierra Vista Subbasin by ADWR from January 1, 2012 through November 11, 2019.¹⁸³

Approximately forty percent of all off-post deficit groundwater pumping in the area is attributable to Fort Huachuca. (BiOp at 28, 153, 154 and 156.) We calculate new Fort Huachuca-attributable San Pedro River-killing deficit groundwater pumping of -2,325.2 acre-feet per year since production of the BiOp by (1) using 40% of the latest deficit figure from USPP (2014) of -5,100 acre-feet per year which equals -2,040 acre-feet/acre; (2) by using 40% of the new -3,302 acre-feet per year approved by the City of Sierra Vista and ADWR for the Pueblo del Sol development which equals -1,321 acre-feet per year; and (3) and by assigning 40% of the 93 acre-feet per year of groundwater pumped by 369 new non-monitoring Sierra Vista subwatershed wells permitted from January 1, 2012 through November 11, 2019 by ADWR. We calculate the 37.2 acre-feet/year of groundwater from the new wells by assuming one home per well and by using the USGS average use per well value of 0.252 acre-feet per year¹⁸⁴ ($369 \times 0.252 = 93$, $93 \times .40 = 37.2$). We note that of these 369 newly permitted wells, 40 are permitted as "non-exempt" wells to pump which may pump more than 35 gallons per minute ("gpm") or more than 56 acre-feet per year. These are obviously not for single home use and will pump much more than the less than 35 gpm each for the permitted exempt wells. An exact new groundwater pumping total will need to be calculated, adjusted, and added to Fort-attributable, deficit groundwater pumping in the new Biological Opinion to account for the newly added non-exempt groundwater pumping wells. We reduce the Fort's attributable deficit by 1,073 acre-feet of actual retired groundwater pumping from the Clinton Drijver farms (BiOp at 169). We do not give the Fort credit for their "avoided future" pumping consistent with FWS' own policy "that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."¹⁸⁵

Specific to the newly permitted, unmitigated deficit groundwater pumping by the Pueblo del Sol Tribute development, the callousness and the arrogance and lack of concern for Fort

¹⁸¹ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

¹⁸² Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.

¹⁸³ Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁸⁴ Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, U.S. Department of the Interior U.S. Geological Survey, Scientific Investigations Report 2016-5114, Version 1.3, April 2019, page 30.

¹⁸⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

Huachuca is epitomized by the November 29, 2012, testimony, under oath, of Richard S. Coffman, Senior Vice President of Castle & Cooke Arizona, owner of Pueblo Del Sol Water Company and the Tribute Development in Sierra Vista. Even though approximately 40% of the inhabitants of the Tribute development are Fort Huachuca-attributable employees, retirees and or contractors, the lack of concern for Fort Huachuca's water problem is gripping:

"Q. Okay. And you testified that there are plans built into the master plan for harvesting and reuse of water. Is it correct that those plans include using most of that water for watering the landscaping with the subdivision?

A. Yes.

Q. And that water is - - and that water therefore would not be available for recharge to the aquifer?

A. That's correct, except insofar as there is some incidental recharge through the landscaping efforts. ...¹⁸⁶

We harken back to ACOE's July 1970 prophetic observation that in July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

"... The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately owned area. ..."¹⁸⁷

And Fort Huachuca Garrison Commander Hunter's observations on February 4, 2006, in the Sierra Vista Herald's "Garrison commander says water is a threat to fort,"

FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ..."¹⁸⁸

Because the City of Sierra Vista, Cochise County, the State of Arizona, ADWR, and local developers like Castle & Cooke have failed to sufficiently help Fort Huachuca in controlling the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, alone and abandoned, must now remove the Fort-attributable the jeopardy facing the San Pedro River and its representative and dependent endangered species by Fort Huachuca.

¹⁸⁶ In the Matter of the Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as having an Adequate Water Supply No. 40-700705.0000.; Docket No. 12A-AWS001-DWR; Pueblo Del Sol Hearing Volume IV 11-29-2012 Transcribed from an Audio Recording pages 694-5.

¹⁸⁷ "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

¹⁸⁸ "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 4, 2006.

CONCLUSION

The BiOp's (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation of its analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [16 U.S.C. § 1536(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Fort Huachuca's failure to consult with FWS to prevent jeopardizing Yellow-billed Cuckoo and Northern Mexico Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Fort Huachuca's and FWS' violate the law because of their failure to reinstate consultation based on new information available since the BiOp that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated, (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; and (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

Because the City of Sierra Vista, Cochise County, the State of Arizona and local developers have failed to help Fort Huachuca with control of the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, must take responsibility for the fact that the Base is jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

In sixty days, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, will seek judicial relief as well as attorney fees and costs, if you have not taken corrective action to stop the multiple violations of law documented in this Notice. 16 U.S.C. § 1540(g)(2)(A)(i).

If you have any questions, please contact, Dr. Robin Silver, via MAIL: Center for Biological Diversity, P.O. Box 1178, Flagstaff, AZ 86002; PHONE: (602) 799-3275; or EMAIL: rsilver@biologicaldiversity.org.

Sincerely,



Robin Silver, M.D.
Co-Founder and Board Member



Date: 12/20/2019

Mr. Stewart Kayiyumptewa
Director, Cultural Preservation Office
Hopi Tribe
P.O. Box 123
Kykotsmovi, AZ 86039

Subject: Proposed Construction and Operation of U.S. Customs and Border Protection Facilities at Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona

Dear Mr. Kayiyumptewa:

In accordance with Section 106 of the National Historic Preservation Act and its implementing Regulations, 36 CFR Part 800, U.S. Customs and Border Protection (CBP) would like to consult with your tribe regarding our proposed action. We welcome your comments on this undertaking and look forward to hearing from you.

CBP proposes to construct, operate, and maintain a joint permanent air operation facility at Libby Army Airfield (LAAF), Fort Huachuca, Cochise County, Arizona (Attachment A, Figure 1). CBP has previously completed a Draft Supplemental Environmental Assessment (SEA) and Final Environmental Assessment (EA) to evaluate various potential parcels near LAAF for construction of a permanent facility. CBP completed a Draft SEA in 2010; however, prior to completion, the Army requested CBP consider a different location. Accordingly, CBP reconsidered a different parcel that was also located on the air field, and in 2016 a Final EA was completed for that location. Most recently, however, the Army and CBP have a desire to construct the facility at the parcel originally considered as the Proposed Action in the 2010 SEA.

Although the 2010 SEA was never circulated for public review (and a Finding of No Significant Impact (FONSI) was not signed), all of the necessary survey work was completed and Section 106 consultation with the Arizona State Historic Preservation Office and relevant tribes for the proposed parcel was completed. CBP plans to update the Draft SEA (2010) for the proposed CBP Office of Air and Marine facility at LAAF, Fort Huachuca, Arizona.

The project includes the construction of a taxiway (50,300 square feet [SF]), an aircraft ramp including a helipad (120,210 SF), an administration facility (10,000 SF) positioned on a 261,088-SF area, and a parking area with spaces for 100 vehicles (122,143 (Appendix A, Figure 2)). As part of the update to the 2010 Draft SEA, CBP will be including an additional 2.8-acre parking

Mr. Kayyumptova
Page 2

area and an additional 1.2-acre taxiway proposed as part of the new project. CBP recently completed cultural and biological surveys of the additional areas.

The proposed parking area is triangular in shape and would involve blading and grading of an already disturbed ground surface. The taxiway would connect an existing taxiway to a proposed ramp and hangar administration building that are covered in the current SEA being prepared for the project.


The Area of Potential Effect (APE) is an approximately 2.8-acre triangular-shaped parcel located north of Beahm Road, and an approximately 1.2-acre rectangular taxiway located between a proposed ramp and an existing Taxiway (see Attachment A, Figure 2).

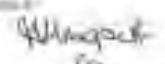
A Class I Overview of the project area was conducted in support of the proposed action. Existing records and previous research from AZSITE, the Archaeological Records Office at the Arizona State Museum, as well as archival records from Gulf South Research Corporation, EnviroSystems, and Bureau of Land Management, General Land Office were consulted. No previous cultural resources were identified in or adjacent to the APE. An intensive pedestrian survey of the APE identified no cultural resources. Enclosed for your review is a copy of the State Historic Preservation Office Survey Report Summary Form for the proposed project.

Based upon the negative findings within the APE, and in accordance with CFR Part 800.4(d)(1), CBP has determined there will be no effect on cultural resources. CBP recommends that no additional cultural resources investigation be required for the proposed action. CBP has received concurrence from the Arizona State Historic Preservation Office (SHPO-2019-2080/150873). CBP is also preparing a Supplemental Environmental Assessment for the proposed action. Per DHS Directive 023-1, Environmental Planning, we will provide you with a copy of the official Draft SEA for the Joint Permanent Air Operation Facility.

If you require any additional information, please contact me at (949) 643-6385 or via email at joseph.zidron@cbp.dhs.gov.

Sincerely,


Joseph Zidron
Real Estate and Environmental Branch Chief
Border Patrol & Air and Marine Program Management Office
U.S. Customs and Border Protection


Kayyumptova
12-21-19

Enclosure

1300 Pennsylvania Avenue NW
Washington, DC 20229



**U.S. Customs and
Border Protection**

July 7, 2021

Sierra Vista Public Library
Attn: Librarian
2600 E. Tacoma Street
Sierra Vista, Arizona 85635

RE: *Draft Supplemental Environmental Assessment for Proposed U.S. Customs and Border Protection Permanent Air and Marine Facility, at Libby Army Airfield, Fort Huachuca, Arizona*

Dear Librarian:

I respectfully request that your library make available to the public the enclosed Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) for a 30-day public review period, beginning the day the Notice of Availability is published in the *Herald Review*. The anticipated date of publication is July 14, 2021. The Draft SEA and Draft FONSI are also available for review and download from the following web address: <https://www.cbp.gov/about/environmental-management-sustainability/documents/docs-review>.

U.S. Customs and Border Protection prepared this Draft SEA and Draft FONSI in compliance with the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code 4321, et seq.), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500–1508), DHS Directive Number 023-01, Rev.01, and DHS Instruction Manual 023-01-001-01, *Implementation of the National Environmental Policy Act*. Recent changes to the CEQ regulations implementing NEPA became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This Draft EA and Draft FONSI substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on December 20, 2019. Therefore, the Draft SEA and Draft FONSI conform to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

Sierra Vista Public Library
Page 2

Members of the public can submit any comments on the Draft EA and Draft FONSI to CBP via email to BPAMNEPA@cbp.dhs.gov or by mail to:

Mr. John Petrilla
U.S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Your prompt attention to this request is greatly appreciated. Thank you.

Sincerely,

**JOHN P
PETRILLA**

Digitally signed by
JOHN P PETRILLA
Date: 2021.07.07
14:37:36 -07'00'

John Petrilla
Acting Environmental Branch Chief
Border Patrol & Air and Marine PMO
U.S. Customs and Border Protection

Enclosures

**SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FOR
PROPOSED U.S. CUSTOMS AND BORDER PROTECTION
PERMANENT AIR AND MARINE FACILITY AT LIBBY ARMY AIRFIELD
FORT HUACHUCA, ARIZONA**

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Arthur Blazer, President
Mescalero Apache Tribe
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Mescalero, NM 88340

Gwendena Lee-Gatewood, Chairwoman
White Mountain Apache Tribe
P.O. Box 700
Whiteriver, AZ 85941

The letter below will be sent to all recipients on the mailing list.

1300 Pennsylvania Avenue NW
Washington, DC 20229



**U.S. Customs and
Border Protection**

July 7, 2021

Amy McGowan, Assistant Planner
Bureau of Land Management
San Pedro National Riparian Conservation Area
4070 S. Averido Saracino
Hereford, AZ 85615

RE: *Draft Supplemental Environmental Assessment for Proposed U.S. Customs and Border Protection Permanent Air and Marine Facility, at Libby Army Airfield, Fort Huachuca, Arizona*

Dear Ms. McGowan:

U.S. Customs and Border Protection (CBP) is pleased to provide the enclosed Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) addressing the construction, operation, and maintenance of a new CBP Air and Marine Operations (AMO) joint permanent facility at Libby Army Airfield (LAAF), Fort Huachuca, Arizona. The Draft SEA and FONSI are also available for download from the following URL address: <https://www.cbp.gov/about/environmental-management-sustainability/documents/docs-review>.

The Draft SEA and Draft FONSI were prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code 4321, et seq.), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500–1508), DHS Directive Number 023-01, Rev.01, and DHS Instruction Manual 023-01-001-01, *Implementation of the National Environmental Policy Act*. Recent changes to the CEQ regulations implementing NEPA became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This Draft EA and Draft FONSI substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on December 20, 2019. Therefore, the Draft SEA and Draft FONSI conform to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

The Proposed Action would replace the current temporary CBP facility located at the southeastern end of LAAF with a new permanent facility. The Proposed Action would also include demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The new permanent facility would provide sufficient land with access to a taxiway to support current and future helicopter and Unmanned Aircraft Systems operations. The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidelines. The facility would have the capacity to accommodate eight

Ms. Amy McGowan
Page 2

aircraft (three - MQ-9 Predator B aircraft, three - AS-350 helicopters, and two - C-206 aircraft) and 100 personnel (47 existing personnel and 53 additional personnel).

CBP invites your participation in the public review process for the enclosed Draft SEA and Draft FONSI. The 30-day public comment period begins on July 14, 2021 and comments must be received by August 13, 2021 to be considered for incorporation into the Final SEA and Final FONSI. Comments on the Draft SEA and Draft FONSI can be submitted by:

- E-mail to: BPAMNEPA@cbp.dhs.gov
- Mail to: Mr. John Petrilla
U. S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Your prompt attention to this request is greatly appreciated. If you require additional information or have any questions, please contact me by telephone at (949) 278-0353 or by e-mail at john.p.petrilla@cbp.dhs.gov.

Sincerely,

**JOHN P
PETRILLA** Digitally signed by
JOHN P PETRILLA
Date: 2021.07.07
09:51:47 -07'00'

John Petrilla
Acting Environmental Branch Chief
Border Patrol & Air and Marine PMO
U.S. Customs and Border Protection

Enclosures

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA)
:SS.
COUNTY OF COCHISE)

PUBLIC NOTICE
PUBLIC NOTICE
NOTICE OF AVAILABILITY
DRAFT SUPPLEMENTAL
ENVIRONMENTAL
ASSESSMENT
FOR PROPOSED U.S.
CUSTOMS AND BORDER
PROTECTION
PERMANENT AIR AND
MARINE FACILITY
AT LIBBY ARMY AIRFIELD
FORT HUACHUCA,
ARIZONA
U.S. CUSTOMS AND BOR-
DER PROTECTION
DEPARTMENT OF
HOMELAND SECURITY

The public is hereby notified of the availability of the Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) prepared by U.S. Customs and Border Protection (CBP) to address the potential effects, beneficial and adverse, resulting from the proposed construction, operation, and maintenance of a new CBP Air and Marine Operations joint permanent facility at Libby Army Airfield (LAAF), Fort Huachuca, Arizona.

The Draft SEA and Draft FONSI were prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code 4321, et seq.), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500-1508), DHS Directive Number 023-01, Rev.01, and DHS Instruction Manual 023-01-001-01, Implementation of the National Environmental Policy Act. Recent changes to the CEQ regulations implementing NEPA became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This Draft EA and Draft FONSI substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on December 20, 2019. Therefore, the Draft SEA and Draft FONSI conform to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

The Proposed Action would replace the current temporary CBP facility located at the southeastern end of LAAF with a new permanent facility. The Proposed Action would also include demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The new permanent facility would provide sufficient land with access to a taxiway to support current and future helicopter and Unmanned Aircraft Systems operations. The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidelines. The facility would have the capacity to accommodate eight aircraft (three - MQ-9 Predator B aircraft, three - AS-350 helicopters, and two - C-206 aircraft) and 100 personnel (47 existing personnel and 53 additional personnel).

The Draft SEA and Draft FONSI are available to the public for download from the following URL address: https://www.cbp.gov/about/environmental-management-sustainability/documents/docs-review. The 30-day public comment period begins with publication of this Notice of Availability. In order for comments to be considered, comments on the Draft SEA and Draft FONSI must be received by August 13, 2021. Comments should be sent to CBP via email to BPAMNEPA@cbp.dhs.gov.

Mr. John Petrilla
U.S. Customs and
Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677
PUBLISH: July 14, 2021

Handwritten signature of Norman Bernard Bernard being first duly sworn, deposes and says: that (he) (she) is the Agent to the Publisher of the HERALD/REVIEW newspaper printed and published five days a week in the City of Sierra Vista, County of Cochise, State of Arizona. That the notice, a copy of which is hereto attached, described as follows:

ENVIRONMENTAL ASSESSMENT
AIR & MARINE FACILITY

was printed and published correctly in the regular and entire issue of said HERALD/REVIEW for 1 issues, that the first was made on the 14th day of July 2021 and the last publication thereof was made on the 14th day of July 2021 that said publication was made on each of the following dates, to wit:

07/14/2021

Request of
GULF SOUTH RESEARCH CORP.

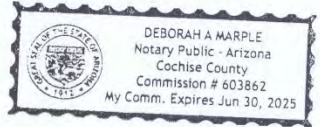
HERALD/REVIEW

By
Subscribed and sworn to before me this 14th day of July 2021

Handwritten signature of Deborah A. Marple

Notary public in and for the County of Cochise, State of Arizona

My Commission Expires:





United States Department of the Interior

Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, Suite C3
Phoenix, Arizona 85051



Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:

AESO/SE
2022-0033593
02EAAZ00-2014-I-0613
22410-2010-I-0421

April 19, 2022

John Petrilla
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Border Patrol & Air and Marine
Program Management Office

Dear Mr. Petrilla:

Thank you for your correspondence of May 4, 2021, received via electronic mail on the same day. This letter documents our review of the U.S. Customs and Border Protection (CBP) Request for Informal Consultation for Proposed Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona (proposed action), in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*). Your letter concluded that the proposed project may affect, but is not likely to adversely affect the ocelot (*Leopardus pardalis*), jaguar (*Panthera onca*), Chiricahua leopard frog (*Lithobates chiricahuensis*; frog), northern Mexican gartersnake (*Thamnophis eques*; gartersnake), Gila topminnow (*Poeciliopsis occidentalis*; topminnow), desert pupfish (*Cyprinodon macularius*; pupfish), Mexican spotted owl (*Strix occidentalis*; owl), western yellow-billed cuckoo (*Coccyzus americanus*; cuckoo), southwestern willow flycatcher (*Empidonax traillii* ssp. *extimus*; flycatcher), northern aplomado falcon (*Falco femoralis septentrionalis*; falcon), and Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*; *Lilaeopsis*). We concur with your determination(s) and provide our rationale(s) below.

Description of the Proposed Action

U.S. Customs and Border Protection (CBP) proposes to construct and operate a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona (proposed action). The proposed action will provide improvements and repairs to the current temporary facility located at the southeastern end of LAAF and will include design and construction of a new permanent facility to replace the existing temporary facility. The new permanent facility will accommodate 8 aircraft and 100 personnel. The facility will provide

sufficient land with access to a taxiway that will allow the facility to support current helicopter and unmanned aircraft systems (UAS) operations. A more detailed description of the proposed action is found in: (1) your August 2019 Biological Resources Survey Report for the Joint Permanent Air Operations Facility at Libby Army Airfield, Fort Huachuca, Arizona U.S. Border Patrol, Tucson Sector, U.S. Customs and Border Protection Department of Homeland Security Washington, D.C. (the equivalent of a Biological Assessment, or BA); (2) your July 2014 *Biological Resources Survey, Proposed Joint Permanent Air Facility, United States Customs and Border Protection, Office of Air and Marine, Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona* (also an equivalent of BA); (3) and your proposed conservation measure, the February 2010 *Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the Upper San Pedro Watershed* (Water Conservation Report). The only substantive difference between the proposed action described in your July 2014 and August 2019 BAs is that the former was based on the then-presence of 47 personnel at LAAF while the latter proposes to employ 100 personnel.

We have already consulted on an earlier variation of the proposed action. We reviewed the July 2014 BA and subsequently transmitted a letter of concurrence on July 14, 2015 (File Numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421). Your agency subsequently acquired a conservation easement on the Flying H Ranch in Cochise County, Arizona, in 2015 to implement the Water Conservation Plans and offset effects to regional groundwater and flows in the Babocomari and San Pedro rivers from staffing at CBP facilities in the upper San Pedro watershed. After accounting for staffing levels at the time, a credit of 82.12 acre-feet per year (AFY) remained to address future water mitigation needs. We reviewed the Water Conservation Report to determine the water-saving credits for your agency's acquisition of a conservation easement on the Flying H Ranch in Cochise County, Arizona to save 210.60 acre-feet per year (AFY) of groundwater. We subsequently transmitted second letter of concurrence on October 30, 2015, (also under File Numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421).

Determination of Effects

The larger airfield is fenced, maintained in an open state, and lacks habitat for the eleven Federally listed species with the potential to occur in the vicinity. No listed species were detected during biological surveys within the current project area per your 2019 BA. The action area also contains no critical habitat for any of the species for which it has been designated. The proposed action's consequences therefore involve no direct effects to any threatened and endangered species.

The most important consequence of the operation of LAAF is the withdrawal of groundwater from the regional aquifer that also supports the baseflow of the upper San Pedro River, lower Babocomari River, and springs where cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish may occur.

Again, current CBP staffing at LAAF consists of 47 people, with a calculated annual groundwater withdrawal of 16.92 AFY. The currently proposed action will increase staffing up to 100 personnel, thereby raising facility water use to approximately 36 AFY and reducing the remaining credit available to address future water mitigation needs from 82.12 AFY to 63.04 AFY.

The fact that unused water mitigation credits exist means that CBP's proposed completion of the LAAF facility and the staffing of that facility with 100 personnel will continue to minimize its indirect effects to the regional aquifer. The proposed action effects are thus insignificant and discountable and not likely to adversely affect cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish. The proposed action is similarly unlikely to adversely affect San Pedro and Babocomari river critical habitat for the cuckoo or the San Pedro River critical habitat for *Lilaeopsis*.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from [FWS Migratory Bird Program web page](#) and [FWS Permits Application Forms](#). For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007, as well as the Conservation Assessment and Strategy for the Bald Eagle in Arizona ([Southwestern Bald Eagle Management Committee website](#)).

In keeping with our trust responsibilities to American Indian Tribes, by copy of this letter we are notifying Tribes that may be affected by this proposed action and encourage you to invite the Bureau of Indian Affairs to participate in the review of your proposed action. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. In all future correspondence on this project, please refer to consultation numbers (ECOSPHERE, 02EAAZ00-2014-I-0613, and 22410-2010-I-0421).

If you require further assistance or if you have any questions, please contact Jason Douglas at 520-670-6150 (extension 226) or Julie McIntyre at 520-670-6159 (extension 223).

Mr. John Petrilla

4

Sincerely,

Julie McIntyre
for

Heather Whitlaw
Field Supervisor

Digitally signed by Julie
McIntyre for
Date: 2022.04.19 14:57:26
-07'00'

cc (electronic):

Assistant Field Supervisor, Fish and Wildlife Service, Phoenix, Tucson or Flagstaff (Attn:
[species leads]) *(as appropriate)*

Manager, Cultural Resources, Ak Chin Indian Community, Maricopa, AZ

Tribal Historic Preservation Officer, Gila River Indian Community, Sacaton, AZ

Director, Cultural Preservation Office, Hopi Tribe, Kykotsmovi, AZ

Chairman, Pascua Yaqui Tribe, Tucson, AZ

Director, Cultural Resources, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ

Manager, Cultural Affairs, Tohono O'odham Nation, Sells, AZ

Director, Cultural Research Program, Yavapai-Prescott Indian Tribe, Prescott, AZ

Branch Chief, Environmental Quality Services, Western Regional Office, Bureau of Indian
Affairs, Phoenix, AZ

Archaeologist, Western Regional Office, Bureau of Indian Affairs, Phoenix

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)

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:

Supplemental Environmental Assessment for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield Fort Huachuca, Arizona July 2021

Project Description:

Supplemental Environmental Assessment for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield Fort Huachuca, Arizona AZGFD# M21-07203346 The Proposed Action would replace the current temporary CBP facility located at the southeastern end of LAAF with a new permanent facility. The Proposed Action would also include demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The new permanent facility would provide sufficient land with access to a taxiway to support current and future helicopter and Unmanned Aircraft Systems operations. The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidelines. The facility would have the capacity to accommodate eight aircraft (three - MQ-9 Predator B aircraft, three - AS-350 helicopters, and two - C-206 aircraft) and 100 personnel (47 existing personnel and 53 additional personnel).

Project Type:

Development Outside Municipalities (Rural Development), Commercial/industrial (mall) and associated infrastructure, New construction

Contact Person:

Tracy C. Bazelman

Organization:

AGFD

On Behalf Of:

DOD

Project ID:

HGIS-14101

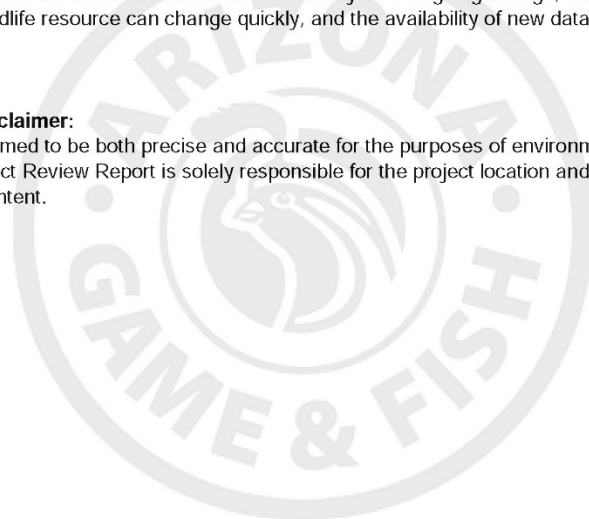
Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

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:

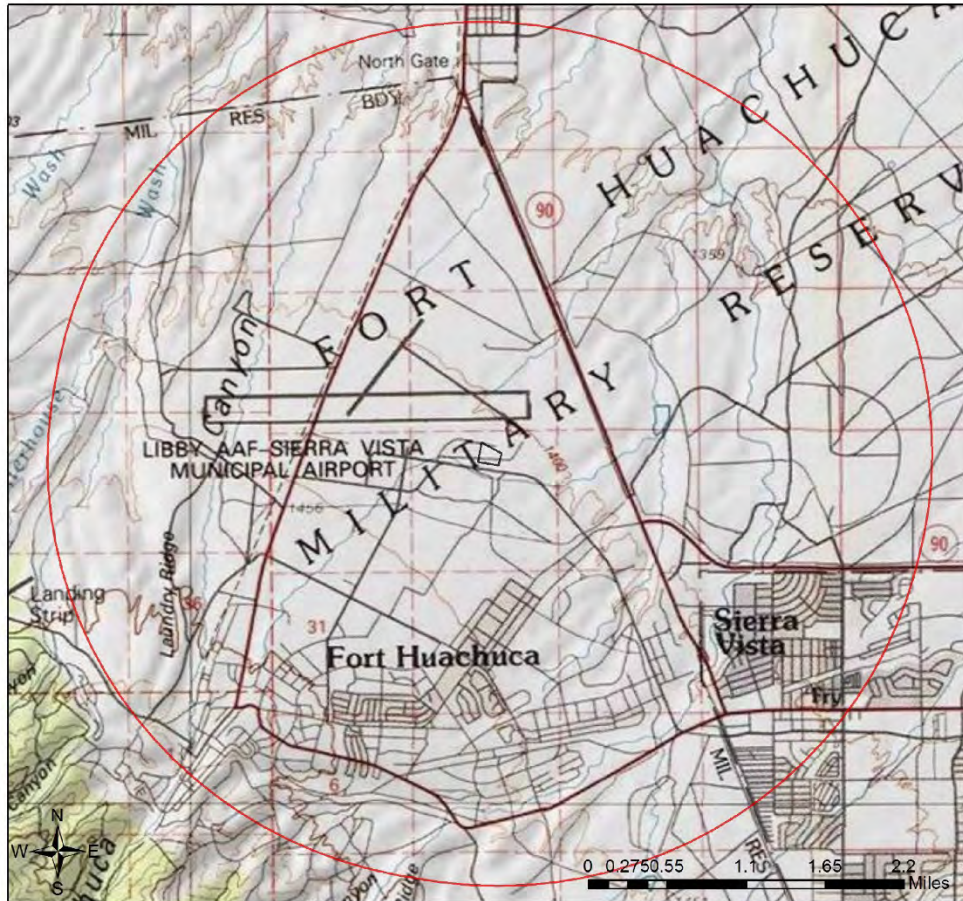
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.



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

Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby A
 USA Topo Basemap With Locator Map



- Project Boundary
- Buffered Project Boundary

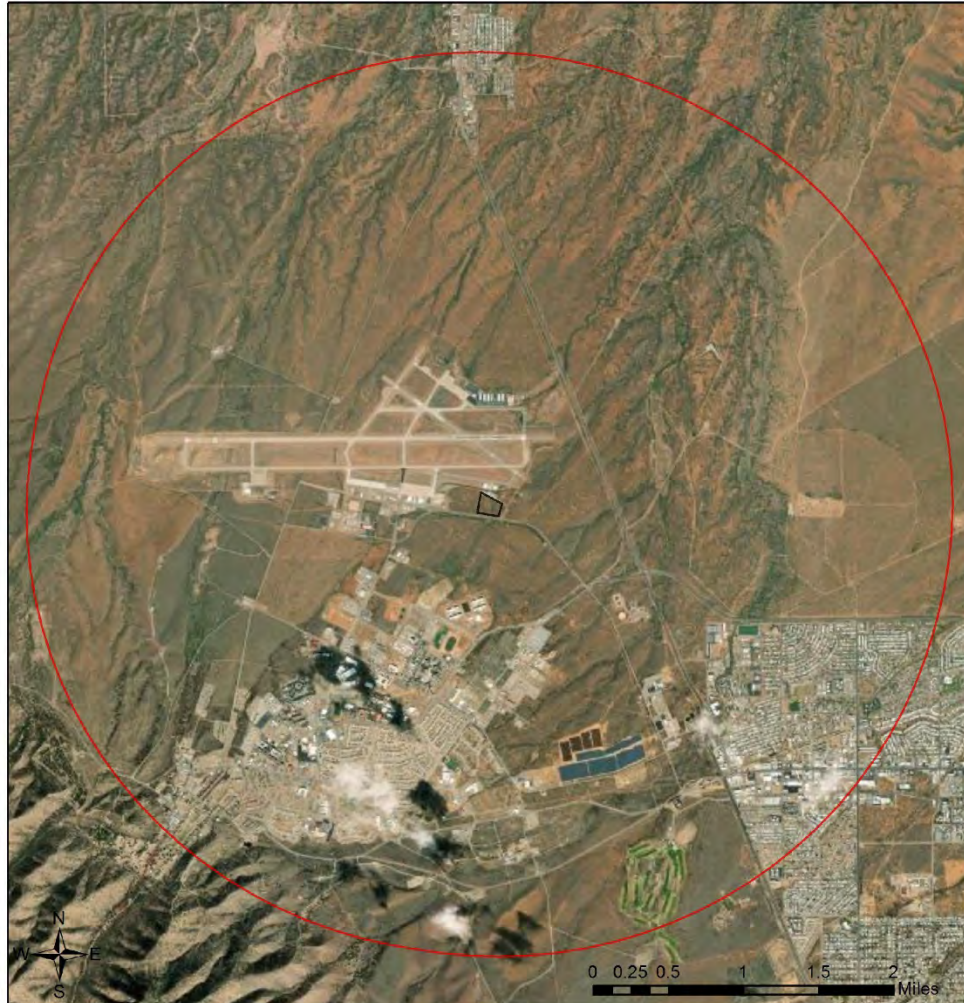
Project Size (acres): 10.86
 Lat/Long (DD): 31.5809 / -110.3327
 County(s): Cochise
 AGFD Region(s): Tucson
 Township/Range(s): T21S, R20E
 USGS Quad(s): FORT HUACHUCA

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap



Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby A

Web Map As Submitted By User



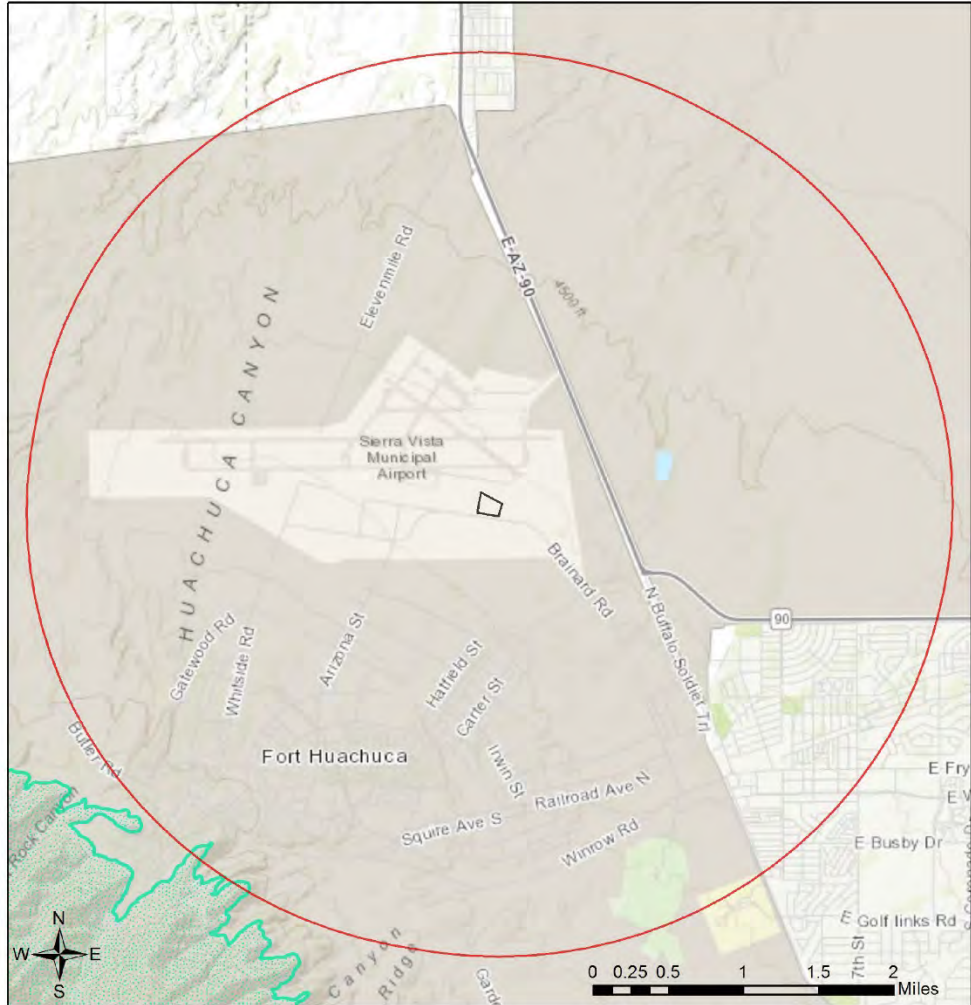
- Project Boundary
- Buffered Project Boundary

Project Size (acres): 10.86
Lat/Long (DD): 31.5809 / -110.3327
County(s): Cochise
AGFD Region(s): Tucson
Township/Range(s): T21S, R20E
USGS Quad(s): FORT HUACHUCA

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby A

Important Areas



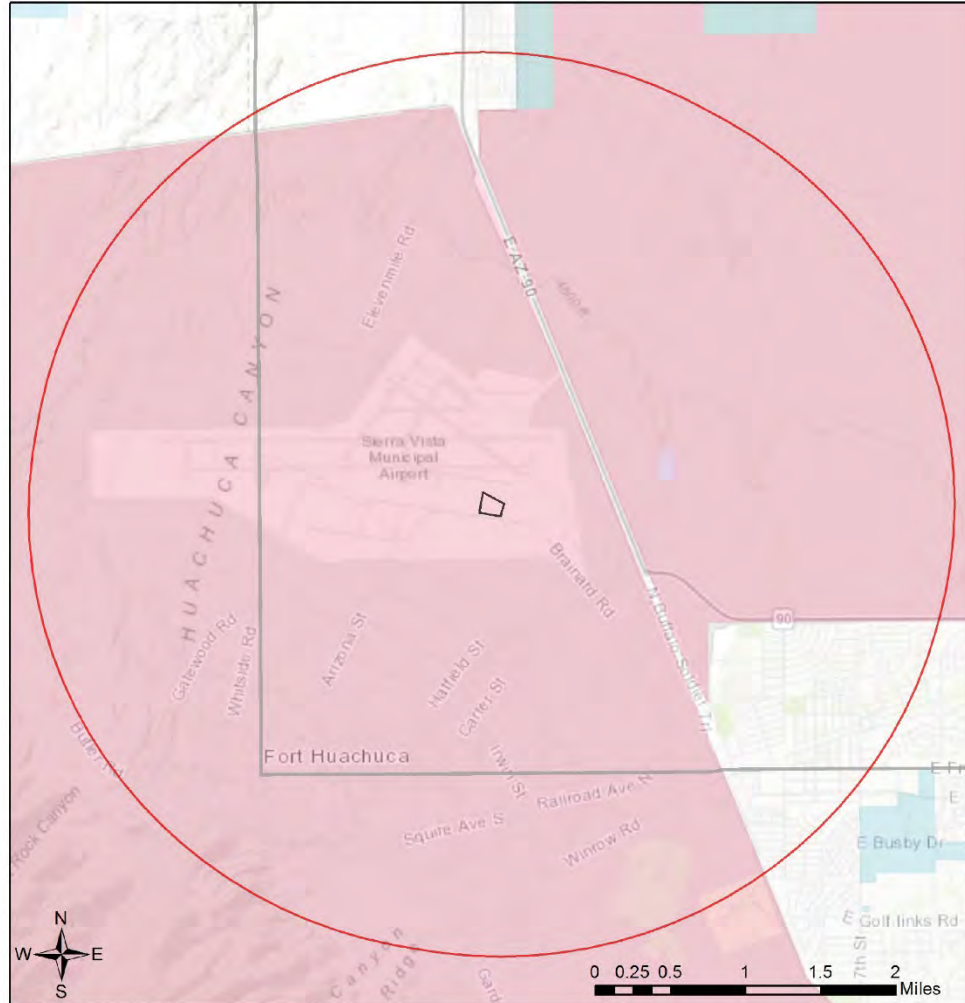
- Project Boundary
- Buffered Project Boundary
- Wildlife Connectivity
- Important Connectivity Zones
- Pinal County Riparian
- Critical Habitat
- Important Bird Areas

Project Size (acres): 10.86
 Lat/Long (DD): 31.5809 / -110.3327
 County(s): Cochise
 AGFD Region(s): Tucson
 Township/Range(s): T21S, R20E
 USGS Quad(s): FORT HUACHUCA

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby A

Township/Ranges and Land Ownership



- | | | |
|---------------------------|------------------------|-------------------------------|
| Project Boundary | Military | Project Size (acres): 10.86 |
| Buffered Project Boundary | Mixed/Other | |
| Township/Ranges | National Park/Mon. | County(s): Cochise |
| Land Ownership | | AGFD Region(s): Tucson |
| AZ Game & Fish Dept. | State & Regional Parks | Township/Range(s): T21S, R20E |
| BLM | State Trust | USGS Quad(s): FORT HUACHUCA |
| BOR | US Forest Service | |
| Indian Res. | Wildlife Area/Refuge | |

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAG, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Special Status Species Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Calothorax lucifer	Lucifer Hummingbird		S			
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S			1B
Terrapene ornata luteola	Desert Box Turtle			S		1A
Thamnophis eques megalops	Northern Mexican Gartersnake	LT	S			1A

Note: Status code definitions can be found at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/>

No Special Areas Detected

No special areas were detected within the project vicinity.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Aix sponsa	Wood Duck					1B
Amazilia violiceps	Violet-crowned Hummingbird		S			1B
Ammodramus savannarum ammolegus	Arizona grasshopper sparrow		S	S		1B
Ammodramus savannarum perpallidus	Western Grasshopper Sparrow					1B
Ammospermophilus harrisi	Harris' Antelope Squirrel					1B
Anthus spragueii	Sprague's Pipit	SC				1A
Athene cucularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Buteo swainsoni	Swainson's Hawk					1C
Callipepla squamata	Scaled Quail					1C
Calypte costae	Costa's Hummingbird					1C
Chordeiles minor	Common Nighthawk					1B
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S			1A
Coluber bilineatus	Sonoran Whipsnake					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus tigris	Tiger Rattlesnake					1B
Cyanthus latirostris	Broad-billed Hummingbird		S			1B
Cynomys ludovicianus	Black-tailed Prairie Dog	CCA		S		1A
Cyrtonyx montezumae	Montezuma Quail					1C
Dipodomys spectabilis	Banner-tailed Kangaroo Rat			S		1B
Empidonax traillii extimus	Southwestern Willow Flycatcher	LE				1A
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Glaucidium gnoma gnoma</i>	Mountain Pygmy-owl					1B
<i>Haliaeetus leucocephalus</i>	Bald Eagle	SC, BGA	S	S		1A
<i>Heloderma suspectum</i>	Gila Monster					1A
<i>Hypsiglena sp. nov.</i>	Hooded Nightsnake					1B
<i>Incilius alvarius</i>	Sonoran Desert Toad					1B
<i>Kinosternon sonoriense sonoriense</i>	Desert Mud Turtle			S		1B
<i>Lasiurus blossevillii</i>	Western Red Bat		S			1B
<i>Lasiurus xanthinus</i>	Western Yellow Bat		S			1B
<i>Leopardus pardalis</i>	Ocelot	LE				1A
<i>Leptonycteris yerbabuenae</i>	Lesser Long-nosed Bat	SC				1A
<i>Lepus alleni</i>	Antelope Jackrabbit					1B
<i>Lithobates chiricahuensis</i>	Chiricahua Leopard Frog	LT				1A
<i>Melanerpes uropygialis</i>	Gila Woodpecker					1B
<i>Meleagris gallopavo mexicana</i>	Gould's Turkey		S			1B
<i>Melospiza lincolni</i>	Lincoln's Sparrow					1B
<i>Melospiza aberti</i>	Abert's Towhee		S			1B
<i>Micrathene whitneyi</i>	Elf Owl					1C
<i>Micruroides euryxanthus</i>	Sonoran Coralsnake					1B
<i>Myiarchus tyrannulus</i>	Brown-crested Flycatcher					1C
<i>Myotis occultus</i>	Arizona Myotis	SC		S		1B
<i>Myotis velifer</i>	Cave Myotis	SC		S		1B
<i>Myotis yumanensis</i>	Yuma Myotis	SC				1B
<i>Notiosorex cockrumi</i>	Cockrum's Desert Shrew					1B
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat					1B
<i>Odocoileus virginianus</i>	White-tailed Deer					1B
<i>Oreoscoptes montanus</i>	Sage Thrasher					1C
<i>Oreothlypis luciae</i>	Lucy's Warbler					1C
<i>Panthera onca</i>	Jaguar	LE				1A
<i>Passerculus sandwichensis</i>	Savannah Sparrow					1B
<i>Peucaea botteri arizonae</i>	Arizona Botteri's Sparrow			S		1B
<i>Phrynosoma solare</i>	Regal Horned Lizard					1B
<i>Picoides arizonae</i>	Arizona Woodpecker		S			1B
<i>Sciurus arizonensis</i>	Arizona Gray Squirrel					1B
<i>Setophaga petechia</i>	Yellow Warbler					1B
<i>Sialia sialis fulva</i>	Azure Bluebird					1B
<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker					1C
<i>Spizella atrogularis</i>	Black-chinned Sparrow					1C
<i>Spizella breweri</i>	Brewer's Sparrow					1C

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Strix occidentalis lucida</i>	Mexican Spotted Owl	LT				1A
<i>Sturnella magna</i>	Eastern Meadowlark					1C
<i>Tadarida brasiliensis</i>	Brazilian Free-tailed Bat					1B
<i>Terrapene ornata</i>	Ornate Box Turtle					1A
<i>Thomomys umbrinus intermedius</i>	Southern Pocket Gopher					1B
<i>Vireo bellii arizonae</i>	Arizona Bell's Vireo					1B
<i>Vulpes macrotis</i>	Kit Fox	No Status				1B

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Callipepla gambelii</i>	Gambel's Quail					
<i>Callipepla squamata</i>	Scaled Quail					1C
<i>Odocoileus virginianus</i>	White-tailed Deer					1B
<i>Patagioenas fasciata</i>	Band-tailed Pigeon					1C
<i>Pecari tajacu</i>	Javelina					
<i>Puma concolor</i>	Mountain Lion					
<i>Zenaida asiatica</i>	White-winged Dove					
<i>Zenaida macroura</i>	Mourning Dove					

Project Type: Development Outside Municipalities (Rural Development), Commercial/Industrial (mall) and associated infrastructure, New construction

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. Guidelines for many of these can be found at: <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

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, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at <https://www.invasivespeciesinfo.gov/unitedstates/az.shtml> and the Arizona Native Plant Society <https://aznps.com/invas> for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at <https://imap.natureserve.org/imap/services/page/map.html>.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select "See What's Here" for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

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>).

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefuna (snakes, lizards, tortoise) from entering ditches.

Communities can actively support the sustainability and mobility of wildlife by incorporating wildlife planning into their regional/comprehensive plans, their regional transportation plans, and their open space/conservation land system programs. An effective approach to wildlife planning begins with the identification of the wildlife resources in need of protection, an assessment of important habitat blocks and connective corridors, and the incorporation of these critical wildlife components into the community plans and programs. Community planners should identify open spaces and habitat blocks that can be maintained in their area, and the necessary connections between those blocks to be preserved or protected. Community planners should also work with State and local transportation planning entities, and planners from other communities, to foster coordination and cooperation in developing compatible development plans to ensure wildlife habitat connectivity. The Department's guidelines for incorporating wildlife considerations into community planning and developments can be found on the Wildlife Friendly Guidelines portion of the Wildlife Planning page at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

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 Arizona Department of Water Resources may be required (<https://new.azwater.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.

Development plans should provide for open natural space for wildlife movement, while also minimizing the potential for wildlife-human interactions through design features. Please contact Project Evaluation Program for more information on living with urban wildlife at PEP@azgfd.gov or at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/> and <https://www.azgfd.com/Wildlife/LivingWith>.

The Department requests further coordination to provide project/species specific recommendations. please contact Project Evaluation Program directly at PEP@azgfd.gov.

Project Location and/or Species Recommendations:

HDMS records indicate that one or more **Listed, Proposed, or Candidate** species or **Critical Habitat** (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at <http://www.fws.gov/southwest/es/arizona/> or:

Phoenix Main Office

9828 North 31st Avenue #C3
Phoenix, AZ 85051-2517
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



PUBLIC COMMENT PERIOD

Comment/Response Matrix
Draft Supplemental Environmental Assessment
Permanent Air and Marine Facility Libby Army Airfield

Number	Responsible	Comment	Response
1	Arizona Astronomy Consortium	The Draft SEA calls for the installation of enhanced lighting, 25-30 foot tall (Section 2.1.2), but without clarification on the types of lighting to be used, how decisions about lighting will be made, or even whether the lighting plan for this DoD facility will adhere to the Department of Defense Unified Facilities Criteria (UFC) Interior and Exterior Lighting Systems and Controls (UFC 3-530-01). While the Draft SEA does acknowledge that enhanced lighting could “disrupt normal ecological processes for native wildlife,” there is no acknowledgment of the potential impact on neighboring observatories or what specific steps will be taken to minimize disruption.	Added to the SEA best management practices for lighting such as shielding to prevent light trespass above the horizon and use of low sodium light bulbs. Lighting will adhere to Department of Defense UFC Interior and Exterior Lighting Systems and Controls (UFC 3-530-01).
2	Amy Oliver	See comment 1	See Response 1
3	Marion Goode	Cochise County understands the importance of responsible outdoor lighting and have instituted outdoor lighting codes in an effort to preserve dark skies. It is my hope that the Federal Government will make every effort to preserve our dark skies.	See Response 1
4	Ann English, Chair Cochise County Board of Supervisors	Thank you for studying this project and finding no significant impact to the environment. This new facility will have a very positive impact on the CBP organization and their mission. Move it forward.	Thank you for your comment and support.

Comment/Response Matrix
Draft Supplemental Environmental Assessment
Permanent Air and Marine Facility Libby Army Airfield

Number	Responsible	Comment	Response
5	Theodore Forte	<p>I am writing to express my concerns regarding the “enhanced lighting” involved in the proposed customs and border protection permanent air and marine facility at Libby Army Airfield Fort Huachuca, Arizona.</p> <p>The SEA makes note of the potential for the lighting to disrupt normal ecological processes for native wildlife, but makes no mention of the adverse impact additional lighting may have on night sky quality.</p>	See Response 1
6	AGFD	<p>During the Department’s review of the document, it was unclear whether any of the temporary buildings slated for demolition were checked for evidence of bat use. In past meetings, Fort Huachuca biologists discussed the long-standing challenge of bat occupation in some of the old buildings on the Fort. These discussions coupled with other documentation of bats in the project vicinity (see attached report) indicate a possibility that all buildings to be demolished could harbor bats. Therefore, the Department recommends that all buildings be checked to determine if they are structurally suitable to provide day and/or night time roosting habitat for bats and whether there is evidence of bat use, such as guano. Please keep in mind that bats may use structures seasonally and those structures should also be evaluated. If bat use has been determined or suspected, bat surveys should be conducted prior to any demolition. The surveys should be scheduled far in advance of proposed work</p>	<p>Added statement to the SEA that existing facilities scheduled for demolition will be evaluated for the presence of bats and appropriate best management practices will be implemented.</p>

Comment/Response Matrix
Draft Supplemental Environmental Assessment
Permanent Air and Marine Facility Libby Army Airfield

Number	Responsible	Comment	Response
		to allow for schedule modification to avoid disruption of maternity roosts during the breeding season. In addition, the Department recommends the hangars also be checked for evidence of use by raptors or other bird species and similar best management practices apply.	
7	AGFD	If trenching occurs, trenching and backfilling crews should be close together to minimize the amount of open trenches at any given time. Avoid leaving trenches open overnight. Where trenches cannot be back-filled immediately, escape ramps should be constructed at least every 90 meters. Escape ramps can be short lateral trenches or wooden planks sloping to the surface. The slope should be less than 45 degrees (1:1). Trenches that have been left open overnight should be inspected and animals removed prior to backfilling	Best management practices have been added to the SEA indicating open holes will be covered at the end of the day. Open trenches will be covered or escape ramps will be constructed in open trenches every 250 feet at the end of the day. Escape ramps would be less than 45 degrees. All open holes will be inspected for wildlife prior to starting daily work activities.
8	AGFD	The Department recommends that Section 5.8 of the SEA include mitigation for any bats occupying existing buildings to ensure safe exclusion measures are employed once bats vacate the structures. It is also recommended that this section include mitigation for any box turtles encountered during construction and/or demolition activities. Please refer to the Department's letter of January 13, 2020 for additional guidance.	Best management practices have been added to the SEA indicating that if construction occurs during the monsoon season, CBP will conduct surveys of the construction area prior to daily work activities and any desert box turtles observed will be relocated outside the project area.
9	Robin Silver, M.D. Center for Biological Diversity	The mitigation for groundwater use that you seek for your proposed U.S. Customs and Border Protection Permanent Air and Marine Facility at Libby Army	CBP respectfully disagrees and believes the agency has fully addressed the potential impacts on

Comment/Response Matrix
Draft Supplemental Environmental Assessment
Permanent Air and Marine Facility Libby Army Airfield

Number	Responsible	Comment	Response
		<p>AirField, Fort Huachuca is contrary to logic. It is not legal.</p> <p>The San Pedro River is in trouble. The severe groundwater pumping deficit that imperils the River can only be mitigated by the retirement of actual, real time groundwater pumping. Your proposed mitigation relies on speculative future water savings credits for avoided future use that fails to retire active water use. Such reliance betrays the fact that USFWS has stated clearly that "[t]o adequately address the overdraft of groundwater in the Upper San Pedro Basin and insure the health of the San Pedro River and the species that depend on it, some current uses of water must cease."* "[A]voided future use" contributes nothing to correcting the current deficit groundwater pumping problem.</p> <p>In addition, you have failed to account for the disintegrating environmental baseline, all other federal activities and the cumulative impacts of all of these San Pedro killing activities. Fort Huachuca, alone, independent of the McCain-Renzi Rider which exempts the Base from the environmental baseline being included in its effects analysis, is jeopardizing at least two species, Huachuca Water Umbel and Yellow-billed Cuckoo as well as the River.</p>	<p>groundwater and mitigated for CBP activities in the Sierra Vista Subwatershed, including the Proposed Action as discussed in Sections 3.4.2.2 and 5.4.4 of the SEA. Alternatives outside the Sierra Vista Subwatershed were not considered for further evaluation because of the unique airspace requirements of UAS operations (see Section 2.3 of the SEA). Documentation supporting CBP's decision is provided in Appendices B and C of the SEA.</p>

Comment/Response Matrix
Draft Supplemental Environmental Assessment
Permanent Air and Marine Facility Libby Army Airfield

Number	Responsible	Comment	Response
		<p>U.S. Customs and Border Protection is not exempt from the McCain-Renzi Rider.</p> <p>You should station your aircraft and personnel in Tucson where you will not be contributing to extinction and the death of the San Pedro River. Please keep us apprised of your decision so that we can object and litigate when you fail to heed our concerns.</p>	

Ticia Bullion

From: BPAM NEPA <bpamnepa@cbp.dhs.gov>
Sent: Monday, August 16, 2021 11:04 AM
To: Howard Nass; Beau Rapier; ELLZEY, KREG (CTR)
Cc: PETRILLA, JOHN
Subject: FW: AGFD comments re: Draft SEA for CBP facility at Libby Army Airfield
Attachments: M21-07203346 AZGFD comm Draft SEA CBP Libby Army Airfield Signed_08122021.pdf

FYI

From: Kristin Terpening <kterpening@azgfd.gov>
Sent: Thursday, August 12, 2021 3:43 PM
To: BPAM NEPA <bpamnepa@cbp.dhs.gov>
Cc: Project Evaluation Program - Game and Fish <PEP@azgfd.gov>; Tracy Bazelman <tbazelman@azgfd.gov>; Raul Vega <RVega@azgfd.gov>; Ginger Ritter <GRitter@azgfd.gov>; Kirby Bristow <kbristow@azgfd.gov>
Subject: AGFD comments re: Draft SEA for CBP facility at Libby Army Airfield

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Mr. Petrilla,
the Arizona Game and Fish Department's comments regarding the Draft SEA are attached for your consideration.
Thank you,
Kristin

—
KRISTIN TERPENING | HABITAT EVALUATION AND LANDS SPECIALIST
ARIZONA GAME AND FISH DEPARTMENT

OFFICE: 520.388.4447
MOBILE: 520.591.2151
EMAIL: kterpening@azgfd.gov

azgfd.gov | 555 N Greasewood Rd, Tucson, AZ 85745

Join our new [Conservation Membership](#) program and ensure a wildlife legacy for the future.

From: [BPAM NEPA](#)
To: [Howard Nass](#); [Beau Rapier](#); [ELLZEY, KREG \(CTR\)](#)
Cc: [PETRILLA, JOHN](#)
Subject: FW: Attn: Fort Huachuca Project
Date: Monday, August 16, 2021 11:03:38 AM
Attachments: [CBP-SEA Libby AZAC Response.pdf](#)

FYI

From: Oliver, Amy <amy.oliver@cfa.harvard.edu>
Sent: Thursday, August 12, 2021 3:58 PM
To: BPAM NEPA <bpamnepa@cbp.dhs.gov>
Subject: Attn: Fort Huachuca Project

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Hello,

I am writing to you today on behalf of the Arizona Astronomy Consortium (AZAC), which represents the professional observatories in the State of Arizona. We have prepared a response of concern to the Fort Huachuca Project for the "Draft SEA for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona."

This formal letter is attached, and the text has been copied below.

Thank you,

Amy

Text of the letter:

August 12, 2021

John Petrilla
Attn: Fort Huachuca Project
U.S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Re: Draft SEA for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona
via electronic mail to: bpamnepa@cbp.dhs.gov

Dear Fort Huachuca Project Planning Committee,

As representatives of the professional observatories in the State of Arizona, we are concerned about some elements proposed in the Draft SEA for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona that is currently under consideration by the CBP.

As a reminder, Arizona hosts the world's largest optical telescope and 10% of all the world's largest telescopes. The Department of Energy, National Science Foundation, Smithsonian Institution, US Navy, and NASA, along with US universities and foreign institutions, invest tens of millions of dollars annually in the operation and upgrade of the Arizona observatories. A basis for their long-term scientific investment strategy is their perception of the commitment of both local and national government to protecting that national and international investment. Libby Field and Fort Huachuca have long been good friends and neighbors to the astronomical community in Arizona, including the University of Arizona's Patterson Observatory in Sierra Vista and the Smithsonian Institution's Fred Lawrence Whipple Observatory on Mt. Hopkins, aligning with efforts to protect dark skies.

So important are observatories to the research, economic, and social welfare of the state of Arizona that the city of Tucson and Pima County have designated Lighting Areas where the preservation of a naturally dark environment, both in the sky and in the visible landscape, is considered of paramount concern. These circular zones of protection around major professional observatories extend well into Santa Cruz County and Cochise County. Sierra Vista and Cochise County, and multiple cities within both, also have established outdoor lighting codes and light pollution codes which contribute to this protection.

The Draft SEA calls for the installation of enhanced lighting, 25-30 foot tall (Section 2.1.2), but without clarification on the types of lighting to be used, how decisions about lighting will be made, or even whether the lighting plan for this DoD facility will adhere to the Department of Defense Unified Facilities Criteria (UFC) Interior and Exterior Lighting Systems and Controls (UFC 3-530-01). While the Draft SEA does acknowledge that enhanced lighting could "disrupt normal ecological processes for native wildlife," there is no acknowledgment of the potential impact on neighboring observatories or what specific steps will be taken to minimize disruption.

The DoD UFC aims to minimize energy consumption, reduce maintenance costs, and improve lighting quality. These criteria specifically address direct glare (4-1.3.1) and light pollution/trespass (4-1.3.2) and call for the use of as low a wattage as possible and the use of fully shielded or IES U0 luminaires to eliminate direct light above the horizontal plane. There are additional recommendations in these criteria concerning the maximum CCT and the use of monochromatic amber LEDs in sensitive environments, including meeting dark sky requirements for observatories like those located in Southern Arizona (4-4.2.1). The UFC further provides criteria for adopting the lowest possible lighting usage zone for a given area in consideration of the nighttime use of all surrounding areas (4-2).

We propose to work with you on a strategic approach to prevent the growth of artificial skyglow as a result of the new projects proposed for Libby Airfield by helping to ensure that DoD UFC criteria are applied, and that appropriate lighting such as fully shielded PC amber are selected for the project. We also propose, following UFC guidance, that the project include local professional lighting engineers and those with astronomical protection experience, and that it be modified to include a provision for the replacement and modernization of existing wasteful and non-conforming unshielded 24CRI HPS flood lights at Libby Airfield to new

fully shielded PC amber area lights at 55CRI.

Protection of the natural desert sky would benefit astronomy and help to further protect sensitive training operations carried out at Libby Airfield, Fort Huachuca, and in the surrounding desert.

Letter Signatories:

Dr. Richard F. Green

Assistant Director for Government Relations
Steward Observatory
University of Arizona

Dr. G. Grant Williams

Director
MMT Observatory

Ms. Amy C. Oliver, FRAS

Public & Government Affairs Officer
Fred Lawrence Whipple Observatory
Smithsonian Astrophysical Observatory

Dr. Lori Allen

Director, Mid-Scale Observatories
Kitt Peak National Observatory
NSF's NOIRLab

Dr. Donald R. Davis

Director Emeritus
Planetary Sciences Institute

Fr. Paul Gabor, S.J., Ph.D.

Vice-Director
Vatican Observatory

Dr. Christian Veillet

Director
Large Binocular Telescope Observatory

Dr. Jeffrey C. Hall

Director
Lowell Observatory

Dr. Constance E. Walker

Scientist
Communications, Education & Engagement
NSF's NOIRLab

Mr. Stephen Larson

Senior Staff Scientist

Lunar and Planetary Laboratory
University of Arizona

Amy C. Oliver, FRAS, CPM
Public Affairs Officer Visitor & Science Center Manager
Fred Lawrence Whipple Observatory
Center for Astrophysics | Harvard & Smithsonian

Office: +1 (520) 879-4406 | Cell: +1 (801) 783-9067
670 Mt. Hopkins Rd. Amado, AZ 85645



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August 12, 2021

John Petrilla
Attn: Fort Huachuca Project
U.S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677



Re: Draft SEA for Proposed Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona
via electronic mail to: bpannepa@cbp.dhs.gov

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<i>Lowell Observatory</i>	<i>University of Arizona Steward Observatory</i>	<i>University of Arizona Planetary Sciences Department</i>
<i>Kitt Peak National Observatory</i>	<i>Fred Lawrence Whipple Observatory</i>	<i>Vatican Observatory</i>

The DoD UFC aims to minimize energy consumption, reduce maintenance costs, and improve lighting quality. These criteria specifically address direct glare (4-1.3.1) and light pollution/trespass (4-1.3.2) and call for the use of as low a wattage as possible and the use of fully shielded or IES U0 luminaires to eliminate direct light above the horizontal plane. There are additional recommendations in these criteria concerning the maximum CCT and the use of monochromatic amber LEDs in sensitive environments, including meeting dark sky requirements for observatories like those located in Southern Arizona (4-4.2.1). The UFC further provides criteria for adopting the lowest possible lighting usage zone for a given area in consideration of the nighttime use of all surrounding areas (4-2).

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Protection of the natural desert sky would benefit astronomy and help to further protect sensitive training operations carried out at Libby Airfield, Fort Huachuca, and in the surrounding desert.

Dr. Richard F. Green
Assistant Director for Government Relations
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Large Binocular Telescope Observatory

Mr. Stephen Larson
Senior Staff Scientist
Lunar and Planetary Laboratory
University of Arizona

Lowell Observatory

*University of Arizona
Steward Observatory*

*University of Arizona
Planetary Sciences Department*

Kitt Peak National Observatory

Fred Lawrence Whipple Observatory

Vatican Observatory

From: [BPAM NEPA](#)
To: [Howard Nass](#); [Beau Rapier](#); [ELLZEY, KREG \(CTR\)](#)
Cc: [PETRILLA, JOHN](#)
Subject: FW: CBP Air Facility - Dark Sky Protection
Date: Monday, July 26, 2021 4:07:06 PM

FYI

From: Marion Goode <goode.marion@yahoo.com>
Sent: Sunday, July 18, 2021 2:16 PM
To: BPAM NEPA <bpamnepa@cbp.dhs.gov>
Subject: CBP Air Facility - Dark Sky Protection

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My decision to move to Hereford was for the rural and quiet lifestyle, the dark skies, and to enjoy birding and other wildlife. I hope Customs and Border Protection will take into consideration the quality of life that Sierra and Vista and Hereford are known for, and that every consideration will be taken when designing the lighting for the Air Facility at Fort Huachuca. It is well documented that poorly designed lighting can affect the foraging, mating, and migratory behaviors of a wide range of nocturnal wildlife. Additionally, loss of dark skies matter. Light pollution denies every one of us, not just astronomers, the opportunity to experience an important part of our natural and cultural heritage. A lost view of the stars extinguishes a connection with the natural world and blinds us to one of the most splendid wonders in the universe. Children who grow up without the experience of a starry night miss invaluable opportunities to speculate about larger questions and learn about the environment and larger world.

It is also documented that the current lighting at Libby Army Air Field is in need of improvement as light from Libby beams horizontally 20 miles to Kartchner Caverns. The bats in the caverns can be disoriented by artificial lighting, and they tend to concentrate around light fixtures and can be easily predated, or become too exhausted to feed or reproduce. In addition to affecting wildlife, Kartchner Caverns State Park could be in jeopardy of losing its Dark Sky Park designation. This is one of the few places nearby that the citizens of Sierra Vista have fairly close by, to enjoy amateur astronomy activities.

Cochise County understands the importance of responsible outdoor lighting, and have instituted outdoor lighting codes in an effort to preserve dark skies. It is my hope that the Federal Government will make every effort to preserve our dark skies.

Sincerely,

Marion Goode
9000 S MULE PL
HEREFORD, AZ. 85615
(520) [732-0170](tel:732-0170)

From: [BPAM NEPA](#)
To: [Howard Nass](#); [Beau Rapier](#); [ELLZEY, KREG \(CTR\)](#)
Cc: [PETRILLA, JOHN](#)
Subject: FW: DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT COMMENTS
Date: Monday, July 26, 2021 4:12:04 PM
Attachments: [BO 4 lawsuit 2 20191203 NOI 20191203 FINAL.pdf](#)

FYI

From: Robin Silver <rsilver@biologicaldiversity.org>
Sent: Thursday, July 22, 2021 11:43 PM
To: BPAM NEPA <bpamnepa@cbp.dhs.gov>
Subject: DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT COMMENTS

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From: Robin Silver <rsilver@biologicaldiversity.org>
Sent: Thursday, July 22, 2021 11:26 PM
To:
Cc: Jeff Humphrey (jeff_humphrey@fws.gov) <jeff_humphrey@fws.gov>; Julie McIntyre (julie_mcintyre@fws.gov) <julie_mcintyre@fws.gov>; 'Duncan, Doug' <doug_duncan@fws.gov>
Subject: DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT COMMENTS

Dear Acting Environmental Branch Chief Petrilla,

The mitigation for groundwater use that you seek for your proposed U.S. Customs and Border Protection Permanent Air and Marine Facility at Libby Army Air Field, Fort Huachuca is contrary to logic. It is not legal.

Please see the attached for a more detailed discussion regarding your claiming of the retirement of future water use as acute mitigation.

The San Pedro River is in trouble. The severe groundwater pumping deficit that imperils the River can only be mitigated by the retirement of actual, real time groundwater pumping. Your proposed mitigation relies on speculative future water savings credits for avoided future use that fails to retire active water use. Such reliance betrays the fact that USFWS has stated clearly that "[t]o adequately address the overdraft of groundwater in the Upper San Pedro Basin and insure the health of the San Pedro River and the species that depend on it, some current uses of water must cease."* "[A]voided future use" contributes nothing to correcting the current deficit groundwater pumping problem.

In addition, you have failed to account for the disintegrating environmental baseline, all other federal activities and the cumulative impacts of all of these San Pedro killing activities. Fort Huachuca, alone, independent of the McCain-Renzi Rider which exempts the Base from the environmental baseline being included in its effects analysis, is jeopardizing at least two species, Huachuca Water Umbel and Yellow-billed Cuckoo as well as the River.

U.S. Customs and Border Protection is not exempt from the McCain-Renzi Rider.

You should station your aircraft and personnel in Tucson where you will not be contributing to extinction and the death of the San Pedro River. Please keep us apprised of your decision so that we can object and litigate when you fail to heed our concerns.

Sincerely, Robin Silver

*Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow; to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

Robin Silver, M.D.
Co-founder and Board Member
Center for Biological Diversity
PO Box 1178
Flagstaff, AZ 86002
Email: rsilver@biologicaldiversity.org
Phone: 602-799-3275
FAX: 928-222-0077
WEB: www.biologicaldiversity.org



December 3, 2019

Certified Mail #

Dr. Mark Espers
Secretary of Defense
U.S. Department of Defense
1000 Defense Pentagon
Washington, DC 20301-1000

Certified Mail #

Ryan D. McCarthy
Secretary of the Army
101 Army Pentagon
Washington, DC 20310-0101
jessica.d.campbell17.civ@mail.mil

Certified Mail #

Maj. Gen. Laura A. Potter
Commanding General
U.S. Army Intelligence Center at Fort Huachuca
2837 Boyd Avenue
Fort Huachuca, AZ 85613
christopher.p.froelich.mil@mail.mil

Certified Mail #

Col. Chad Rambo
Fort Huachuca Garrison Commander
2520 Healy Avenue
Fort Huachuca, AZ 85613-7002
daniel.d.haws.civ@mail.mil

Certified Mail #

David Bernhardt
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240
exsec@ios.doi.gov

Certified Mail #

Margaret Everson, Principal Deputy
Director Exercising Authority of the
Director
1849 C Street, NW
Washington, DC 20240
Margaret_Everson@fws.gov

Certified Mail #

Amy Lueders
Regional Director, Southwest Region
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103
RDLueders@fws.gov

Certified Mail #

Supervisor Jeff Humphrey
Arizona Ecological Services Field Office
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
jeff_humphrey@fws.gov

RE: Sixty-Day Notice of Intent to Sue Fort Huachuca and U.S. Fish and Wildlife Service for Endangered Species Act Violations jeopardizing the San Pedro River and the endangered species that represent and depend on the River.

Dear Dr. Espers, Mr. Bernhardt, Mr. McCarthy, Maj. Gen. Potter, Col. Rambo, Ms. Everson, Ms. Lueders, and Mr. Humphrey,

The U.S. Secretary of Defense, Secretary of the Army, Fort Huachuca Commanding General and Garrison Commander, the U.S. Secretary of the Interior, U.S. Fish and Wildlife Service Director, Region 2 Director, and Arizona Ecological Services Director are hereby notified that the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to file suit, pursuant to the citizen suit provision of the Endangered Species Act ("ESA"), 16 U.S.C. § 1540(g), and the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 701-706, to compel the reinitiation of ESA Section 7 consultation¹ to remedy Fort Huachuca activities jeopardizing the San Pedro River and the endangered species that represent and depend on the San Pedro.

EXECUTIVE SUMMARY

The San Pedro River is the last surviving, undammed desert river in the Southwest.² In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area ("SPRNCA") within the Sierra Vista Sub-basin "[i]n order to protect the riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."³ The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River is one of Arizona's, the Nation's, and the World's environmental crown jewels.⁴

¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

² *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental Cooperation, 1999.; *Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981.; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999.; "A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, *National Geographic*, April 2000.; "Alternative Futures for Landscapes in the Upper San Pedro River Basin of Arizona and Sonora, Carl Steinitz, Robert Anderson, Hector Arias, Scott Bassett, Michael Flaxman, Tomas Goode, Thomas Maddock III, David Mouat, Righard Peiser and Allan Shearer, USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005.; "We pump too much water out of the ground—and that's killing our rivers, Alejandra Borundo, *National Geographic*, October 2, 2019.

³ *Arizona-Idaho Conservation Act, 16 U.S.C. § 460xx(a)*, November 18, 1988.

⁴ "Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem, Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978.; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values, BLM*, 1987.; "U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988.; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988.; *San Pedro Riparian Area*," Sam Negri, *Arizona Highways Magazine*, April 1989.; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.; "Arizona Riparian Protection Program Legislative Report," ADWR, July 1994.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "Rio San Pedro, One of the last great places," Robert C. Dyer, *Arizona Highways Magazine*, May 1996.; "The Ageless Waters of the San Pedro River," Roseann Beggy Hanson, *Arizona Highways Magazine*, November 1998.; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999.; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999.; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, *National Geographic*, April 2000.; "If National Geographic can see the San Pedro as a jewel, can't those of us living here?" Editorial, *Sierra Vista Herald*, April 25, 2000.; ; "A treasure at risk, Bill threatens San Pedro River," Editorial, *Arizona Republic*, May 23, 2002.; "Siphoning the San Pedro," Editorial, *Arizona Daily Star*, May 26, 2002.; "Last Great Places, San Pedro River, Miracle in the Desert," The Nature Conservancy Website,

The San Pedro River in summer:



© Robin Silver

August 20, 2002.; *"Riparian rip-off, A silly rider has popped up in Congress, again – and should die again,"* Editorial, Arizona Republic, May 21, 2003.; and *"A river to save, the fate of the San Pedro will rest on McCain's shoulders,"* Editorial, Arizona Republic, September 2, 2003.

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year, will cease within the next century.⁵ San Pedro River base flow is disappearing because the Fort Huachuca/Sierra Vista area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.⁶ Department of Defense/Fort Huachuca-attributable unmitigated, deficit groundwater pumping is a major contributor to this problem.⁷

We are compelled, at this time, to seek judicial assistance in saving the San Pedro River and its representative and dependent endangered species for three major reasons:

1. We have newly secured a report previously covered up by Fort Huachuca, titled "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared by Fort Huachuca contractor, GeoSystems Analysis, Inc., in 2010.⁸ The report finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003,⁹ and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."¹⁰

Fort Huachuca failed to share this report with the U.S. Fish and Wildlife Service ("FWS")¹¹ during the last evaluation in 2014 of Fort Huachuca's effects on the San Pedro River for preparation of the March 31, 2014, Endangered Species Act ("ESA") Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014. ("BiOp").¹²

⁵ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

⁶ Ibid.

⁷ BiOp at 80, 85, 154, and 169.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, L.L.C., Boulder, CO, www.integratedhydro.com, November 21, 2019.

⁸ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

⁹ Ibid., pages 3-10, 11, 12 and 13.

¹⁰ Ibid., page 3-11.

¹¹ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

¹² U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

The March 31, 2014, BiOp authorizes Fort Huachuca activities. If the Base had not covered up the GeoSystems (2010) report conclusions, Fort Huachuca activities would not have been cleared to the current levels.

2. The City of Sierra Vista and Cochise County have failed to keep their promise to "balance the area's water deficit by 2011,"¹³ while the State of Arizona and the Arizona Department of Water Resources ("ADWR") have approved 431 new wells since December 31, 2011,¹⁴ when data gathering ended for the BiOp.¹⁵

Because of the failure of Sierra Vista, Cochise County, and ADWR to keep their promise and to help Fort Huachuca mitigate the approximate 40% of the off-post groundwater pumping attributable to the Base,¹⁶ Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area will be increasing by 61.9% since the BiOp from 1,453 acre-feet per year¹⁷ to approximately 2,325.2 acre-feet per year.¹⁸; and,

3. New hydrological modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdown) at year 2100 show that "[d]rawdowns exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."¹⁹ These new findings are from Integrated Hydro Systems from Boulder, Colorado.

Relating to the Army's covered up GeoSystems (2010) report, Integrated Hydro (2019) also concludes that,

"It should be noted that this evaluation [by Integrated Hydro (2019)] does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this [Integrated Hydro (2019)] study, the total Fort-Attributable pumping impacts on the San Pedro

¹³ "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

¹⁴ Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁵ BiOp at 3.

¹⁶ BiOp at 28, 153, 154 and 156.

¹⁷ BiOp at 80, 85, 154, and 169.

¹⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁹ Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019., page 13.

River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."²⁰

Integrated Hydro (2019) summarizes their new modeling of simulated Fort-attributable groundwater levels (or drawdown) at year 2100 in the following illustration of the simulated reduction in streamflow from Fort-attributable groundwater pumping:



Figure 16. Change in Winter Streamflow (cfs) at Year 2100 due to Fort-Attributable Groundwater Pumping and Recharge (Southern SPRNCA Area). Positive values indicate streamflow decreases, and Negative values indicate streamflow increases. 24

In addition to the above three major findings that have compelled us to initiate these legal proceedings, we have identified multiple examples of clear violations of law by Fort Huachuca and FWS.

The Endangered Species Act ("ESA") requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize the survival and the recovery of federally protected endangered species and their essential habitat.²¹ The consultation must be based on the best available scientific information.²² If, after a consultation, significant new information becomes available, a new consultation must take place.²³ In addition, the Administrative

²⁰ Ibid., pages 4-5.

²¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

²² 16 U.S.C. § 1536(a)(2).

²³ 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16; 50 C.F.R. § 402.14(g).

Procedure Act requires that federal decisions are not "arbitrary, capricious, or an abuse of discretion."²⁴

All federal activities at Fort Huachuca are currently authorized by the March 31, 2014, FWS Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014 ("BiOp").²⁵ The BiOp is based on information provided to FWS by Fort Huachuca in the November 13, 2013, Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca ("PBA").²⁶ Species representing and dependent on the San Pedro River evaluated in the BiOp include Huachuca Water Umbel, Jaguar, Chiricahua Leopard Frog, Mexican Spotted Owl, Lesser Long-nosed Bat, Ocelot, and Sonora Tiger Salamander.

The BiOp currently authorizing Fort Huachuca activities is no longer valid for three reasons: (1) the BiOp failed to use the best available scientific information and arrives at its conclusions in an arbitrary and capricious manner, (2) the BiOp has not been reexamined as required with subsequent new San Pedro River related listings, and (3) the BiOp has not been reexamined as required as new information has become known.

Based on a failure to use the best available scientific information, the BiOp wrongly concludes that the Fort's operations will not jeopardize the continued existence and recovery of federally protected species representing and dependent upon the San Pedro River. The BiOp arrives at its erroneous non-jeopardy conclusion owing to the facts that:

1. The BiOp inappropriately relies upon speculative water-savings credits for "avoided future use" that fail to retire active water uses.²⁷
2. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel that had already ceased pumping in 2004,²⁸ and had no chance of being restarted because 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years would be captured water that would otherwise supply surface flow to the San Pedro.²⁹
3. The BiOp inappropriately relies upon an arbitrary limitation of the BiOp's analysis time to ten years.;

²⁴ 5 USC §706(2)(A).

²⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

²⁶ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

²⁷ Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow; to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

²⁸ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, R.G., Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; *Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress*, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget; U.S. Geological Survey, 2014, Table 4, page 8.

²⁹ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012. <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47.

4. The BiOp fails to include in its hydrological modeling, the fact that the effects of Fort Huachuca's pre-BiOp on post groundwater pumping were already harming the River significantly by 2003,³⁰ and that even if all groundwater pumping were stopped as of 1988, "the cone of depression ... in the Sierra Vista area would not recover completely in 100 years.",³¹ and,
5. The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow, in spite of the fact that FWS' concurrence contradicts its own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,³² Pupfish,³³ Spikedace³⁴ and Loach Minnow.³⁵

These errors, (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [16 U.S.C. § 1536(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Since FWS' March 31, 2014, BiOp release, two more species representative of and dependent upon the San Pedro River, Yellow-billed Cuckoo³⁶ and Northern Mexican Gartersnake,³⁷ have been added to the federal list of endangered species. When new species are added to the federal list and are affected by federal actions such as Fort Huachuca's groundwater pumping, the law requires that Fort Huachuca consults with FWS to ensure that the Base's activities will not jeopardize survival and recovery of these species.³⁸ Fort Huachuca has not consulted with FWS as required in spite of the fact that the Base's activities are jeopardizing the survival and recovery of these species. Fort Huachuca's failure to consult with FWS to prevent

³⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010, page 3-11.

³¹ U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca; August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix., pages 14 & 15.

³² Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax traillii extimus*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

³³ Desert Pupfish (*Cyprinodon maularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

³⁴ Spikedace (*Meda fulgida*) Recovery Plan, USFWS, September 1991.

³⁵ Loach Minnow (*Tiaroga cobitis*) Recovery Plan, USFWS, September 1991.

³⁶ Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coereba americana*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

³⁷ Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

³⁸ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

jeopardizing Yellow-billed Cuckoo and Northern Mexican Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Since release of the March 31, 2014, BiOp, new information is now available that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated;³⁹ (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release; and (4) that Fort Huachuca covered up and failed to provide FWS the report, GeoSystems (2010) for BiOp preparation.

Specifically, since BiOp release, new information includes,

1. On-post stormwater recharge has provided 60% less recharge for the last four years than anticipated in the BiOp.⁴⁰
2. On-post effluent recharge has provided 47% less recharge for the last five years than anticipated in the BiOp.⁴¹
3. Off-post, the Palominas stormwater recharge project has provided 90% less recharge than anticipated in the BiOp.⁴²
4. Arizona has become both hotter and drier.⁴³ Climate models project that precipitation and soil moisture in the Southwest will continue to decrease.⁴⁴ The recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and "Incidental Recharge" (BiOp at 168) will be diminished even further in the future.⁴⁵

³⁹ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

⁴⁰ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

⁴¹ Ibid.

⁴² Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

⁴³ National Oceanic and Atmospheric Administration National Centers for Environmental Information, City Time Series, published October 2019, retrieved on October 22, 2019 from <http://www.ncdc.noaa.gov/cag/>.

⁴⁴ Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (p. 217); Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN (pp. 231, 238).

⁴⁵ Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose,

5. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area⁴⁶ will be increasing by 61.9 % from 1,453 acre-feet per year⁴⁷ to approximately 2,325.2 acre-feet per year.⁴⁸; and
6. Fort Huachuca covered up and failed to provide to FWS for BiOp production,⁴⁹ GeoSystems (2010)⁵⁰ which finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003;⁵¹ and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."⁵²

This new information reveals effects of Fort Huachuca's actions that are affecting the San Pedro River and its dependent endangered species and Critical Habitat to an extent not previously considered. A new consultation and BiOp addressing this new information are now required by law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

In 60 days from the date of this Notice, in accordance with the ESA citizen suit provision, 16 U.S.C. § 1540(g), if Fort Huachuca and FWS fail to correct the multiple violations of law listed above, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to seek judicial remedy.

FACTUAL BACKGROUND

The San Pedro River

The San Pedro River is the last surviving, undammed desert river in the Southwest.⁵³ In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area

D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN; Seager, R., T. Mingfang, L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: 482-486.

⁴⁶ Sierra Vista Subbasin

⁴⁷ BiOp at 80, 85, 154, and 169.

⁴⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

⁴⁹ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

⁵⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

⁵¹ *Ibid.*, pages 3-10, 11, 12 and 13.

⁵² *Ibid.*, page 3-11.

⁵³ *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental

("SPRNCA") within the Sierra Vista Sub-basin.⁵⁴ The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River, specifically within the Sierra Vista Sub-basin, is one of Arizona's, the Nation's, and the World's environmental crown jewels.⁵⁵ In 1993, Life Magazine recognized the San Pedro River as one of America's Last Great Places.⁵⁶

In 1999, the North American Free Trade Agreement's Commission for Environmental Cooperation observed,

"Every year, millions of songbirds migrate from their wintering grounds in Mexico and Central America to their summer breeding habitats in Canada and the northern United States. In order to successfully cross the desert landscapes of northern Mexico and the southwestern United States, migrating songbirds congregate and travel along a small number of north-south oriented corridors where they are able to find shelter, food, and water. Especially, they travel along the rivers: the Rio Grande/Rio Bravo, the Colorado, the Santa Cruz, and the San Pedro.

Over the last century, we have lost much of the riparian habitat upon which many migratory bird species depend. ...

Unlike the other rivers listed above [Rio Grande/Rio Bravo, Colorado, and Santa Cruz], the overall health and quality of the upper San Pedro River and its riparian habitat have not declined significantly over the last century. On both sides of the border, the San Pedro River continues to support riparian habitat of exceptional quality and increasing scarcity elsewhere, offering an alternative route for species whose previous migratory pathways have been lost or degraded to the point where they can no longer sustain large populations. Indeed, there is mounting evidence suggesting that more birds use the upper San Pedro now than ever before. However,

Cooperation, 1999; Desertification of the United States, David Sheridan, Council on Environmental Quality 1981.; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999.; "A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, *National Geographic*, April 2000.; "We pump too much water out of the ground—and that's killing our rivers," Alejandra Borundo, *National Geographic*, October 2, 2019.

⁵⁴ *Arizona-Idaho Conservation Act*, 16 U.S.C. § 460xx(a), November 18, 1988.

⁵⁵ "Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem, Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978.; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values, BLM*, 1987.; "U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988.; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988.; *San Pedro Riparian Area*," Sam Negri, *Arizona Highways Magazine*, April 1989.; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.; "Arizona Riparian Protection Program Legislative Report," ADWR, July 1994.; *American Birding Association, Inc.*, "Winging It", Volume 7, Number 10, October 1995.; "Rio San Pedro, One of the last great places," Robert C. Dyer, *Arizona Highways Magazine*, May 1996.; "The Ageless Waters of the San Pedro River," Roseann Beggy Hanson, *Arizona Highways Magazine*, November 1998.; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999.; "In Arizona Desert, a Desert Oasis in Peril," Jon Christensen, New York Times, May 4, 1999.; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, *National Geographic*, April 2000.; "If National Geographic can see the San Pedro as a jewel, can't those of us living here?" Editorial, *Sierra Vista Herald*, April 25, 2000.; ; "A treasure at risk, Bill threatens San Pedro River," Editorial, *Arizona Republic*, May 23, 2002.; "Siphoning the San Pedro," Editorial, *Arizona Daily Star*, May 26, 2002.; "Last Great Places, San Pedro River, Miracle in the Desert," The Nature Conservancy Website, August 20, 2002.; "Riparian rip-off, A silly rider has popped up in Congress, again – and should die again," Editorial, *Arizona Republic*, May 21, 2003.; and "A river to save, the fate of the San Pedro will rest on McCain's shoulders," Editorial, *Arizona Republic*, September 2, 2003.

⁵⁶ *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.

there has also been growing concern that this valued transboundary ecosystem, and the hydrological system that supports it, may be on an unsustainable course.

As in many regions along the Mexican and US border, the upper San Pedro valley faces one of the most pressing challenges of the next century - water scarcity."⁵⁷

In the Upper San Pedro Basin, groundwater from the deep local aquifer seeps from the banks of the San Pedro River to provide base flow, or surface flow in the River during the driest times of the year.⁵⁸ Wells within the sub-basin intercept this groundwater and aquifer water that would otherwise surface or day-light as San Pedro River surface flow. There is no difference between groundwater and surface water in the Sierra Vista Sub-basin. The water is intimately connected. It is the same water.⁵⁹

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year will cease within the next century. San Pedro River base flow will cease within the next century because the area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.⁶⁰

In June 2011, because of the uncontrolled, excessive, local groundwater pumping, hydrologist Dr. Laurel Lacher's modeling concluded "much" of the aquifer-sourced San Pedro River base flow, or stream flow during the dry times of the year "will cease... over the next century." Dr. Lacher's exact quotation (2011) states:

⁵⁷ Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat on the Upper San Pedro River, North American Free Trade Agreement Commission for Environmental Cooperation, 1999.

⁵⁸ *Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area*, Arizona; Arizona Water Commission, March 18, 1974; *Correspondence*; from: Stephen G. Thompson, Director, Fort Huachuca Directorate of Engineering and Housing; to: Dr. Walter S. Patton, Cochise College President, RE: Response to your request for addressing the water issue in the Upper San Pedro River area.; March 30, 1994.; *SIERRA VISTA SUBWATERSHED HYDROLOGY PRIMER*, produced for the City of Sierra Vista, Bella Vista Water Company, Inc. and Pueblo Del Sol Water Company, ASL Hydrologic & Environmental Services in conjunction with R. Allan Freeze Engineering, Inc., December 1994.; *Upper San Pedro River case study*, Arizona Riparian Protection Program, Legislative Report, Arizona Department of Water Resources, Pages 147-208, July 1994.; *A Groundwater Flow Model of the Sierra Vista Subwatershed of the Upper San Pedro Basin*, Southeastern Arizona, Steven W. Correll, Frank Corkhill, Daryl Lovvik, and Frank Putman, Arizona Department of Water Resources Hydrology Division, Modeling Report No. 10, Phoenix, Arizona December 1996.; *Hydrogeologic Investigations of the Sierra Vista Subwatershed of the Upper San Pedro Basin*, Cochise County, Southeast Arizona, D.R. Pool and Alissa L. Coes, *Water-Resources Investigations Report 99-4197*, USGS, 1999.; *Order*, Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al., *CIV99-203 TUC ACM*, 198 F. Supp. 2d 1139, April 8, 2002.; *Ground-water flow model of the Sierra Vista Subwatershed and Sonoran portions of the Upper San Pedro Basin*, southeastern Arizona, United States, and northern Sonora, Mexico, D.R. Pool and J.E. Dickinson, U.S. Geological Survey Scientific Investigations Report 2006-5228, 48 p.; *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, R.G. Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; *Order*, Center for Biological Diversity et al. v. Kenneth L. Salazar, et al., *CV 07-484-TUC-AWT*; 2011 WL 2160254 (D.Ariz.); May 28, 2011. *Correspondence*, from: Julie A. Decker, Deputy State Director, Bureau of Land Management Arizona Resources Division; to: Mr. Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources; Subject: Designation of Adequate Water Supply (File No. 40-700705, Pueblo Del Sol Water Company) and Water Report (File No. 53-700704, The Oaks); March 16, 2012.

⁵⁹ *Ibid.*

⁶⁰ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callegary, N.V. Paretto, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

“In general, the simulations predict that, in the absence of any major water use changes in the basin, much of the San Pedro and Babocomari rivers will cease to have perennial baseflow over the next century due to the widespread impacts of projected groundwater pumping.”⁶¹

Dr. Lacher has since updated this 2011 study and in February 2018, Lacher’s conclusion is essentially the same:

“The capture analysis in this study demonstrates that simulated natural recharge and existing MAR [Managed Aquifer Recharge] are insufficient to meet the net pumping demand in the model area, even at the reduced pumping rates in this study compared with the 2011 model update by Lacher.”⁶²

In February 2017, the U.S. Geological Survey [“USGS” or “Gungle et al. (2017)"] similarly notes:

“Nonetheless, it should be obvious that a subwatershed perennially in deficit will likely never see an increase in natural groundwater discharge to the river... Even if groundwater pumping were to stop today and the groundwater budget balance was positive for decades to come, the effects of pumping over the past century would eventually capture surface flow from the river (Leake and others, 2005; Barlow and Leake, 2012). According to recent modeling, some capture of surface flow from the San Pedro River is already occurring (Lacher and others, 2014) ...

Base flow has been declining at the Palominas, Charleston, Tombstone, and Lower Babocomari gaging stations over the entire period of record... groundwater flow modeling, which can isolate the effects of groundwater pumping, has shown that water levels in the subwatershed have declined since 1902, reducing the groundwater gradients that influence groundwater flow toward the river by as much as 17 percent (Lacher and others, 2014). Water-level declines also reduce the total volume of water that flows to the river...

The expanding cone of depression (as expressed by the declining horizontal hydraulic gradients and decreasing water levels on Fort Huachuca) should be of interest to water managers and to those with an interest in the SPRNCA. Even if pumping were immediately reduced or stopped, the cone would continue to propagate for decades or more (Leake and others, 2005; Barlow and Leake, 2012). Without significant mitigation measures, it is likely too late already to prevent declining water levels from reaching the San Pedro River riparian area from Charleston to Tombstone.”⁶³

Because of the San Pedro River's rarity and because of the groundwater pumping threat that it faces, many endangered species who represent the River's health depend on the San Pedro

⁶¹ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.

⁶² Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

⁶³ Gungle, B., J. B. Callegary, N.V. Paretto, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg. 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

for survival and for recovery. These endangered species include Southwestern Willow Flycatcher,⁶⁴ the Western Yellow-billed Cuckoo,⁶⁵ the Northern Mexican Gartersnake,⁶⁶ Ocelot, Jaguar, Loach Minnow,⁶⁷ Spikedace⁶⁸ and Huachuca Water Umbel.⁶⁹

FACTUAL BACKGROUND

The History of Fort Huachuca's water problem and the Impact of the Base's Groundwater Pumping

Fort Huachuca's water problem and its vulnerability to "no control... over the drilling of new wells in the privately owned area" off post have been known to the U.S. Army for 50 years.⁷⁰ Today, Fort Huachuca's water problem is reaching the point of no return.⁷¹

A 1966 report by the U.S. Geological Survey and Fort Huachuca, "Water Resources of Fort Huachuca Military Reservation," says,

"A second well field, if developed in the North Gate-Libby Field area, would partly accomplish the same result [decrease the draft on the ground-water reservoir] by decreasing the heavily concentrated draft on the ground-water reservoir of the Fort Huachuca well field, and by utilizing groundwater that now moves unused

⁶⁴ Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax traillii extimus*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

⁶⁵ "San Pedro Riparian National Conservation Area...Perhaps 30 percent of the western U.S. population Yellow-billed Cuckoos breed here" from Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine December 2002, Vol. 104, No. 5.; At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River from, Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.; SPRNCA has the largest population of Cuckoos in the western United States. Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

⁶⁶ Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

⁶⁷ Loach Minnow (*Tiaroga cobitis*) Recovery Plan, USFWS, September 1991.

⁶⁸ Spikedace (*Medea fulgida*) Recovery Plan, USFWS, September 1991.

⁶⁹ Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, Final Rule, U.S. Fish and Wildlife Service (USFWS), Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

⁷⁰ "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S. Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.; "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970

⁷¹ Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callgary, N. V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019.

northeastward to the San Pedro River. ... In the East Gate-Fort Huachuca-Sierra Vista area, the cone of depression caused by pumping is readily apparent."⁷²

The additional problem for Fort Huachuca of "no control over the rate of pumping nor over the drilling of new wells in the privately-owned area" has been recognized by the Army for almost as long. In July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

"The ground water in the area of the post well field is overdrawn, and a large cone of depression has been formed in the water table. Water levels in the area of influence (a radius of 1 to 2 miles) have continued to decline and will continue until and unless pumping is reduced. The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately-owned area. ...

Increasing the pumping capacity in or near the post well field will aggravate the problem of declining water levels. The water requirements for the base should not be increased until new sources of water have been put on line to lower the pumping rate from the existing well field, and to furnish reserve pumping capacity."⁷³

ACOE then commissioned an additional study to confirm the problems that they had identified. On March 18, 1974, the Arizona Water Commission reports on a study requested by ACOE "to prepare a special report evaluating the adequacy of Fort Huachuca's water supply based upon the Commission's regional studies,"

"The model predicts reductions in the aquifer discharge to the rivers ranging from 20 percent to about 50 per cent for the four runs. This would reduce base flows as well as and probably reduce the water supply available to phreatophytic vegetation along portions of the San Pedro and Babocomari Rivers."⁷⁴

Then, following up on the Arizona Water Commission's report, on March 29, 1974, ACOE again warns of Fort Huachuca's water problem in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report,"

"Two significant cones of depression have developed in the area due to pumping in the Fort Huachuca-Sierra Vista area and the Huachuca City area, which includes the former community of Huachuca Vista... The depression cone in the Fort Huachuca-Sierra Vista area is centered about the military post well field and appears to extend for approximately 4 miles... the cone of depression is approximately 1.5 miles wide. ...

⁷² "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S. Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.

⁷³ "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

⁷⁴ *Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area, Arizona*, Arizona Water Commission, March 18, 1974.

Heavy pumping in the Huachuca Vista area has apparently reversed the direction of ground-water flow along the reach of the Babocomari River for several miles downstream from Huachuca City...⁷⁵

Thirty years later, Fort Huachuca's water problem was still making headlines. On February 4, 2006, in "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ...

Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.

While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.

What is unrecognized by many is "we didn't do well in some areas," Hunter said.

One area of concern of water...

With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said.⁷⁶

Fort Huachuca obviously realized that the "water conservation clock" was problematic when it covered up GeoSystems (2010)⁷⁷ where the Base's own consultant found that,

"Figure 23 ['Changes in Stream Discharge Due to ON-POST'] shows that, out of these three years, the simulated impact of on-post wells on baseflow in the Babocomari and the San Pedro rivers peaked in 2003, with the greatest impact, depletions of 1 to 2 cubic-feet per second (cfs), occurring at the confluence of the two rivers."⁷⁸ ...

⁷⁵ Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report, U.S. Army Engineer District, Los Angeles, Corps of Engineers, March 29, 1974.

⁷⁶ "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 4, 2006.

⁷⁷ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, prepared by GeoSystems Analysis, Inc. November 2010.

⁷⁸ Ibid., page 3-11.

Figure 24 ['Changes in Stream Discharge Due to All Fort-Attributable Pumping'] shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23 ['Changes in Stream Discharge Due to ON-POST'], those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence."⁷⁹

"... peak impacts to simulated baseflow occur in 2050 [page 3-11] ... Figure 27 ['Stream Reaches Pumped Dry by FORT-Related Wells ON- and OFF-Post'] shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping."⁸⁰

And now in 2019, the full extent of Fort Huachuca-attributable groundwater pumping from 2011 to 2100, and the Base-attributable groundwater pumping' harm to the San Pedro River is becoming more apparent. On November 21, 2019, Integrated Hydro Systems finds that at year 2100, modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdowns)

"... exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."⁸¹

Even more concerning is Hydro Systems (2019) further conclusion that,

"It should be noted that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."⁸²

Predictably, though, "those who share the Sierra Vista Subwatershed," Fort Huachuca, Sierra Vista, Huachuca City, Tombstone, Bisbee, and Cochise County have failed the congressional mandate to bring use and recharge into balance by 2011. Consequently, the words of Fort Huachuca Garrison Commander Colonel Hunter, "[t]he biggest threat to this Southern Arizona Army post is water" now ring more true than ever. The "water conservation clock" has run out.

⁷⁹ Ibid.

⁸⁰ Ibid., page 3-15.

⁸¹ Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019., page 13.

⁸² Ibid., pages 4-5.

ENDANGERED SPECIES ACT LAW

I. ESA requirements

A. Section 7 consultation requirements

The ESA is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.” *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). Its purpose is to conserve endangered and threatened species and the ecosystems upon which they depend. 16 U.S.C. § 1531(b). Section 7(a)(2) of the ESA prohibits federal agencies from undertaking actions that are “likely to jeopardize the continued existence” of any listed species or “result in the destruction or adverse modification of” critical habitat. *Id.* § 1536(a)(2). “Jeopardy” results when it is reasonable to expect, “directly or indirectly,” that the action would appreciably reduce “the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” 50 C.F.R. § 402.02. “Adverse modification” is defined as “a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species.” *Id.*

To enable compliance with section 7’s substantive mandate, the ESA and its implementing regulations impose specific procedural duties on federal agencies, requiring an “action agency”—in this case, the Fort—to consult with FWS before undertaking any “action” that “may affect” a listed species or its designated critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). An “action” includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies,” in which there is “discretionary Federal involvement or control.” 50 C.F.R. §§ 402.02, 402.03. The “may affect” threshold for consultation under section 7(a)(2) is low, and is triggered by “[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character.” *Nat’l Parks Conservation Ass’n v. Jewell*, 62 F. Supp. 3d 7, 13 (D.D.C. 2014) (quoting 51 Fed. Reg. 19,926, 19,949–50 (June 3, 1986)). FWS and the action agency must use the best scientific and commercial data available throughout the consultation process. 16 U.S.C. § 1536(a)(2).

As a first step, the Federal action agency prepares a biological assessment (“BA”). 50 C.F.R. §§ 402.02, 402.12. The BA must evaluate the potential “effects of the action” on listed and proposed species and designated and proposed critical habitat within the “action area” and determine whether any such species or habitat are “likely to be adversely affected by the action.” *Id.* § 402.12(a), (c). “Effects of the action” are defined as “the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.” *Id.* § 402.02. “Indirect effects” are those that are “caused by the proposed action and are later in time, but still are reasonably certain to occur.” *Id.* “Interrelated actions” are those that are “part of a larger action and depend on the larger action for their justification.” *Id.* “Interdependent actions” are those that “have no independent utility apart from the action under consideration.” *Id.* Finally, “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” *Id.*

The type of consultation required is determined by the degree of anticipated effects reported in the BA. Informal consultation is sufficient if the action agency determines, with FWS’s written concurrence, that the proposed action “may affect,” but is “not likely to adversely affect” the species or its critical habitat. *Id.* §§ 402.13(a), 402.14(b)(1). If informal consultation or the BA conclude that the proposed action “may affect” a listed species or its critical habitat,

the action agency must initiate formal consultation with FWS. *Id.* § 402.14(a). During the consultation process, the action agency may not make any irreversible or irretrievable commitments of resources. 16 U.S.C. § 1536(d). Formal consultation is completed when FWS issues a Biological Opinion determining whether the proposed action, taken together with its cumulative effects, is “likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.” 50 C.F.R. § 402.14(g)(4).

B. Biological Opinions

The BiOp must include a “detailed discussion of the effects of the action on listed species or critical habitat.” *Id.* § 402.14(h)(2). The BiOp can either find (1) no jeopardy or no adverse modification; (2) that the action will cause jeopardy or adverse modification but such jeopardy or adverse modification can be avoided by implementing certain reasonable and prudent alternatives to the proposed action as designed; or (3) that jeopardy or adverse modification is unavoidable and thus the action cannot proceed. *Id.* § 402.14(h)(3). The BiOp’s finding must be based on FWS’s independent analysis of the “action area,” the “effects of the action”—including the action’s “indirect effects” and effects of “interrelated or interdependent” activities—and the “cumulative effects” on listed species or critical habitat. *Id.* §§ 402.02, 402.14(g). In other words, the BiOp must consider “*all the impacts . . . which can be anticipated*” to result from the action “using the best available science.” *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002) (emphasis added). This means “[a]n agency may not ignore future aspects of a federal action” by segmenting or cutting off its analysis. *Id.* at 1155.

FWS’s jeopardy analysis in a BiOp must consider a species’ survival *and* recovery. 50 C.F.R. § 402.02; *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 932 (9th Cir. 2008) (noting survival and recovery are “intertwined needs that must both be considered in a jeopardy analysis”). “This does not mean that a jeopardy or adverse-modification analysis must include the formulation of a specific recovery plan.” *Ctr. for Biological Diversity v. Salazar*, 804 F. Supp. 2d 987, 998 (D. Ariz. 2011). Recovery must, however, “be considered explicitly and separately from survival.” *Id.* at 999. During this recovery analysis, FWS must identify when a species “will likely pass the tipping point for recovery, and determine whether the proposed action will cause the species to reach that tipping point.” *Id.* (citing *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 527 (9th Cir. 2010)). That way, the BiOp “provides some reasonable assurance that the agency action in question will not appreciably reduce the odds of success for future recovery planning, by tipping a listed species too far into danger.” *Nat’l Wildlife Fed’n*, 524 F.3d at 936.

If FWS issues a BiOp that does not adequately evaluate the effects of the action and cumulative effects on listed species and critical habitat—considering both survival and recovery—then FWS’s “opinion on whether the action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat” is factually and legally flawed. See 50 C.F.R. § 402.14(h)(3). In such instances, the BiOp would fail to adequately assess whether the proposed action was likely to jeopardize listed species. See *Commer v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988).

Any ESA violation—including a legally flawed BiOp—is subject to judicial review under the ESA’s citizen suit provision. 16 U.S.C. § 1540(g)(1)(A).

In assessing jeopardy, each agency shall use the best scientific and commercial data available. *16 U.S.C. § 1536(a)(2)*. Looking at the best scientific and commercial data available is a standard that requires far less than conclusive proof. *Greenpeace v. National Marine Fisheries Service*, 55 F. Supp. 2d 1248, 1262 (W.D. Wash. 1999). This standard recognizes that better scientific evidence will most likely always be available in the future.

ENDANGERED SPECIES ACT VIOLATIONS

A. The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses.

The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses. Such reliance betrays the fact that FWS has stated clearly that "[t]o adequately address the overdraft of groundwater in the Upper San Pedro Basin and insure the health of the San Pedro River and the species that depend on it, some current uses of water must cease."⁸³ "[A]voided future use" contributes nothing to correcting the current deficit groundwater pumping problem.

Even for actual retired groundwater pumping, FWS says that "this water use reduction cannot be used to mitigate future projects and the water use that may occur with those projects."⁸⁴ The BiOp at 294 states that "[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."⁸⁵ Nonetheless, Fort Huachuca and FWS rely upon "avoided future use" to avoid acknowledging that Fort Huachuca-attributable groundwater pumping jeopardizes the San Pedro River and its representative and dependent endangered species.

B. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel.

The BiOp inappropriately relies upon water-savings credits for "retirement" of agricultural groundwater pumping from the Preserve Petrified Forest parcel that had already ended in 2004.⁸⁶

The Preserve Petrified Forest parcel, sometimes also referred to as the Three Canyons/Palomina parcel, is located only 1.25 miles west of the San Pedro River. Restarting of the agricultural pumping would be capturing 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years from water that would otherwise be

⁸³ Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow; to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement., January 25, 2002.

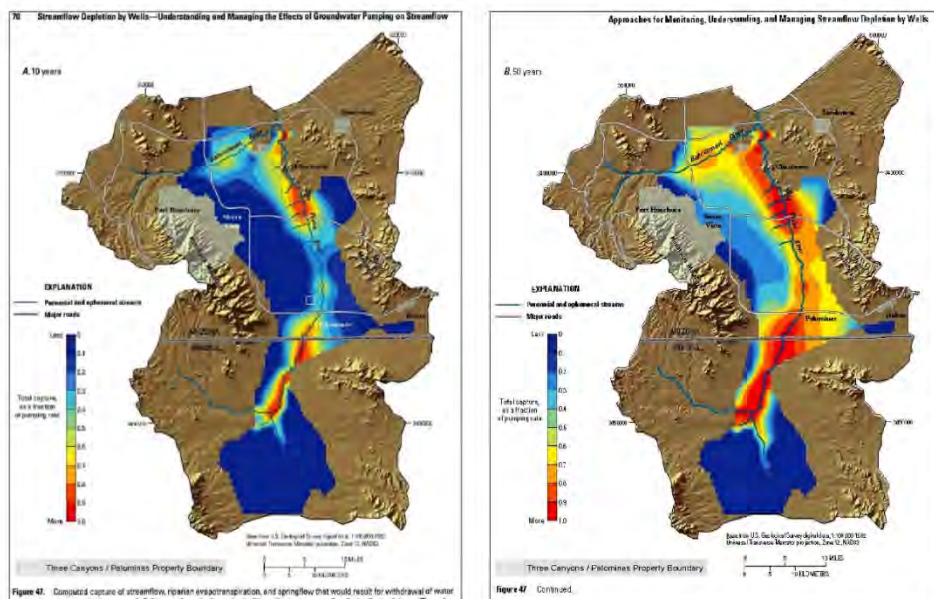
⁸⁴ *Ibid.*

⁸⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

⁸⁶ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, R.G., Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget, U.S. Geological Survey, 2014, Table 4, page 8.

supplying surface water to the San Pedro.⁸⁷ Such an aggressively destructive action would never overcome the legal challenges against the theft of federal water⁸⁸ and against the obvious and blatant "taking" that would result from the pumping's jeopardizing the San Pedro River and its representative and dependent federally listed endangered species.⁸⁹ The following maps are illustrative of just how clearly "taking" of San Pedro River surface water would be demonstrated in any legal challenge to the parcel's reinstatement of agricultural pumping.

The following maps from U.S. Geological Survey's ("USGS") 2012, "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow" illustrate the property's location and the resulting percentage of pumped groundwater that would not end up as streamflow.⁹⁰ Preserve Petrified Forest parcel is the square northwest of Palominas, and west of the San Pedro on the following maps:



⁸⁷ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47.

⁸⁸ *Cappaert v. United States* 426 U.S. 128 [1976]; *Kansas v. Colorado*, 115 S. Ct. 1995; *Nebraska v. Wyoming*, 115 S. Ct. 1033, 1937 (1995).

⁸⁹ Section 9 of the ESA and its implementing regulations prohibit the unauthorized "take" of any endangered or threatened species of fish or wildlife. 16 U.S.C. § 1538(a)(1); 16 U.S.C. § 1533(d); 50 C.F.R. § 17.31. "Take" is defined broadly under the ESA to include harming, harassing, trapping, capturing, wounding or killing a protected species either directly or by degrading its habitat. 16 U.S.C. § 1532(19).

⁹⁰ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47.

In addition, before preparation of the BiOp, the fact that the Preserve Petrified Forest property was never going to be used for agriculture again, was established by Preserved Petrified Forest's own marketing efforts to subdivide their property for single homes on four acre lots, and not for future agricultural production. On August 6, 2007, in "Of politics and the river; An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," High Country News reports:

"Preserve Petrified Forest is now offering to sell the 480 acres for \$5.2 million, says Sierra Vista Realtor Beth Wilkerson, the listing agent for the land.

Wilkerson says the land is zoned to build up to 161 homes..."⁹¹

Even stepping back from the "avoided future use" fallacy, preventing the water use of 161 homes using approximately 40 acre-feet/year,⁹² is nothing like sham "retirement" already retired agricultural pumping and receiving credit for "retirement" of 2,558 acre-feet/year. BiOp at 29, 45, and 169. Nonetheless, in spite of the facts that (1) agricultural pumping had already stopped,⁹³ (2) that any attempt at restarting agricultural pumping would result in significant capture of San Pedro River surface flow,⁹⁴ and (3) that at most, the non-corrupt purchase to stop development would result in "avoided future use" of only 161 homes,⁹⁵ the BiOp dishonestly credits Fort Huachuca with "immediate" "onset of a 'positive' Fort Huachuca groundwater budget balance...in 2014 or 2015."⁹⁶ Specifically, to highlight FWS' dishonest giving the Fort credit in this scam, the BiOp says,

"The residual, and temporary, reduction in baseflows (modeled to be 0.01 CFS at the most) that may occur before the onset of a "positive" Fort Huachuca groundwater budget balance in 2014 or 2015 [citing "Preserve Petrified Forest conservation measure (C10) in Table HWU2" in BiOp at 169 for 2,558 acre-feet/year beginning in 2014] (wherein a surplus of conservation measure-driven water savings overtakes the influence of Fort Huachuca's water demands on baseflows) will be within the range of conditions experienced by the species and thus, the proposed action is unlikely to result in a contraction of the species occurrence in the San Pedro River..." BiOp at 165.

Earlier, the BiOp at 161, FWS states, equally as dishonestly, that "[i]t is likely... that the relatively large magnitude of net groundwater surplus anticipated to begin to affect the river in 2014 (or later) will ensure the adverse effects will be of short duration, and more than completely ameliorated."

⁹¹ <http://www.hcn.org/issues/351/17143>

⁹² Using the accepted local standard of approximately 0.25 acre-feet/year per home.

⁹³ Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. See *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget, U.S. Geological Survey, 2014, Table 4, page 8.

⁹⁴ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; See in particular: FIGURE 47

⁹⁵ "Of politics and the river, An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," John Dougherty, High Country News, August 6, 2007, <http://www.hcn.org/issues/351/17143>.

⁹⁶ Quoting from the footnote (#6) in BiOp at 165: "Again, we note that the Preserve Petrified Forest conservation measure (C10) in Table HWU2 (and Revised PBA Table 5-1) was implemented in 2013, rather than 2014 as anticipated. The effects of the measure will thus occur earlier than initially anticipated (beginning in 2014 rather than 2015)."

C. **The BiOp inappropriately limits the BiOp's analysis time to ten years, thus ignoring the adverse effects that will occur beyond that artificial time window.**

The BiOp inappropriately relies upon an arbitrary and capricious limitation of the BiOp's analysis time to ten years without any regulatory authority, without basis on FWS' Consultation Handbook,⁹⁷ without basis on the legally mandated use of the best available science,⁹⁸ and with special treatment inconsistent with all other recent FWS' evaluations of military activities in Arizona.⁹⁹ The BiOp's limitation of its analysis time to ten years ignores the facts that (1) the Fort's activities will certainly last longer than 10 years,¹⁰⁰ that (2) the effects of the action will extend well beyond ten years,¹⁰¹ and (3) most deceitfully, that the Fort failed to disclose the fact

⁹⁷ Endangered Species Consultation Handbook, Procedure for Conducting Consultations and Conference Activities Under Section 7 of the Endangered Species Act, U.S. Fish & Wildlife Service and National Marine Fisheries Service, March 1998; https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

⁹⁸ 16 U.S.C. § 1536(a)(2); *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

⁹⁹ For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat, AESO/SE 02-21-95-F-0114R4; August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army National Guard (AZ/ARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station - Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SSLI-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

¹⁰⁰ "Rumsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense; September 9, 2004, http://www.defenselink.mil/news/Sep2004/n09092004_2004090909.html; National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110-181—JAN. 28, 2008 [\$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110-417—OCT. 14, 2008 [\$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111-84—OCT. 28, 2009 [\$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114-92—NOV. 25, 2015 [\$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114-328—DEC. 23, 2016 [\$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115-91—DEC. 12, 2017 [\$30,000,000].

¹⁰¹ SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.; Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, U.S. Fish and Wildlife Service; January 6, 1997, page 665.; U.S. Fish and Wildlife Service, Biological Opinion concerning impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, Arizona. #AESO/ES 2-21-02- F-229 August 23, 2002, page 205.; Leake, S.A., Hoffmann, J.P., and Dickinson, J.E., 2005, Numerical ground-water change model of the C aquifer and effects of ground-water withdrawals on stream depletion in selected reaches of Clear Creek, Chevelon Creek, and the Little Colorado River, northeastern Arizona: U.S. Geological Survey Scientific Investigations Report 2005-5277, 29 p., <https://pubs.usgs.gov/sir/2005/5277/>.; "Ground Water Development - The Time to Full Capture Problem," J. Bredehoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x; 2009.; Groundwater Hydrology of the San Pedro Basin, Robert Mac Nish, Kathryn J. Baird, and Thomas Maddock III, Chapter Fifteen in Ecology and Conservation of the San Pedro River. Edited by Juliet C. Stromberg and Barbara Tellman, University of Arizona Press, Tucson, 2009, page 299.; "Calculation of

that its own contractor, GeoSystems Analysis, found that Fort Huachuca-attributable groundwater pumping "peak impacts to simulated baseflow occur in 2050."¹⁰²

The BiOp's arbitrary and capricious evaluation window limitation is dramatized by FWS' special treatment of Fort Huachuca differently from FWS' treatment of other military bases. From 1996 – 2017, FWS' Arizona Ecological Services Office has consulted on the activities of multiple other military bases in Arizona;¹⁰³ however, only Fort Huachuca has had its consultation evaluation period limited to such an artificially narrowed time period. None of these other military activities evaluations were similarly limited by the BiOp's nonsensical rationale that the evaluation must be limited because of "uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process." BiOp at 20 and 158.

None of these other FWS' Arizona Ecological Service Office Biological Opinions are similarly limited with such an artificial time constraint because such a limitation is not legal. It is illegal to piecemeal the evaluation of an agency's actions.¹⁰⁴

In addition, specific to Fort Huachuca, on April 8, 2002, the Court addressed the illegality of Fort Huachuca's attempt at narrowing its evaluation window to piecemeal FWS' consultation:

"Courts have consistently held that [*39] a biological opinion has to "analyze the effect of the entire agency action," *Conner v. Burford*, 848 F.2d 1441, 1453 (9th Cir. 1988), cert. denied, *Sun Exploration & Production v. Laganm* 489 U.S. 1012, 103

Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>; Gungle, B., J. B. Callegary, N.V. Paretto, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, I.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

¹⁰² Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010; page 3-11.

¹⁰³ For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat, AESO/SE 02-21-95-F-0114R4, August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army National Guard (AZARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station - Yuma, Yuma and Maricopa Counties, Arizona; AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SSLI-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

¹⁰⁴ *Conner v. Burford*, 848 F.2d 1441, 1453 (9th Cir. 1988).; *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al.*, CIV99-203 TUC ACM, 198 F. Supp. 2d 1139, April 8, 2002.

L. Ed. 2d 184, 109 S. Ct. 1121 (1989) (emphasis added), including all indirect and cumulative effects of the action on threatened and endangered species, 50 C.F.R. § 402.14(g)(3); 50 C.F.R. § 402.02. An agency may not ignore future aspects of a federal action by segmenting that action into phases. In fact, in *Conner*, the Court held that all phases of oil and gas leasing had to be evaluated for potential impacts at the leasing stage, even though the final phase -construction of oil and gas wells - was uncertain to occur. *Conner*, 848 F.2d at 1453-1458; See also *North Slope Borough v. Andrus*, 206 U.S. App. D.C. 184, 642 F.2d 589, 608 (D.C. Cir. 1980 (agency may not deal exclusively with one stage of the project).

In *Conner*, the FWS issued a biological opinion only with regard to the leasing stage because it did not have sufficient data to render a comprehensive [**40] opinion beyond the initial leasing phase. Instead of issuing a comprehensive biological opinion the FWS concluded that the leasing phase did not jeopardize endangered species. The FWS envisioned an "incremental-step consultation approach, with additional biological evaluations prior to subsequent activities. The court rejected this. The fact that insufficient evidence was available did not excuse the FWS from rendering a comprehensive opinion on the entire agency action. The court explained, as follows:

Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available ... We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. *Conner*, 848 F.2d at 1453-1454."

Looking specifically at *Conner*, FWS' disregard for the law and legal precedent in the BiOp becomes even more offensive:

"Appellees argue that the FWS failed to prepare biological opinions based on the best data available. We agree. The FWS took the position that there was insufficient information on post-leasing activities to prepare comprehensive biological opinions. Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available. For example, appellees point out that three-fourths of the area studied in the forests had been designated "essential" or "occupied" habitat for protected species. See Appellees' Exhibit 11. Indeed, the environmental assessments prepared by the Forest Service contained detailed information on the behavior and habitats of the species, and discussed the likely impact of various stages of oil and gas activities. See *Threatened and Endangered Species Biological Evaluation (Flathead EA, Appendix G)* (E.R. at 260-87); *Biological Evaluation (Gallatin EA, Appendix B)* (E.R. at 311-95); see also *Gallatin Biological Opinion at D7* (E.R. at 401). We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. 16 U.S.C. Sec. 1536(a)(2). With the post-leasing and biological information that was available, the FWS could have determined whether post-leasing activities in particular areas were fundamentally incompatible with the continued existence of the species. Indeed, by recommending the exclusion of areas

where leasing would conflict with the conservation of protected species, the FWS implicitly admitted that even minimal exploration and development would be incompatible with the conservation of the species in some areas that can be identified before any agency action is taken.³⁰ Gallatin Biological Opinion at D7 (E.R. at 401). With the information available, the FWS could also have identified potential conflicts between the protected species and postleasing activities due to the cumulative impact of oil and gas activities. For example, species like the grizzly and the gray wolf require large home ranges making it critical that ESA review occur early in the process to avoid piecemeal chipping away of habitat. See *id.*

Furthermore, although the FWS justified the decision to delay completing comprehensive biological opinions on the inexact information about post-leasing activities. Congress, in enacting the ESA, did not create an exception to the statutory requirement of a comprehensive biological opinion on that basis. The First Circuit, for example, has recognized that the Secretary may be required to make projections, based on potential locations and levels oil and gas activity, of the impact of production on protected species. See *Roosevelt Campobello Int'l Park Comm'n v. EPA*, 684 F.2d 1041, 1052-55 (1st Cir.1982) (EPA must prepare "real time simulation" studies of low risk oil spills despite the fact that study will only produce informed estimate of potential environmental effects).

In light of the ESA requirement that the agencies use the best scientific and commercial data available to insure that protected species are not jeopardized, 16 U.S.C. Sec. 1536(a)(2), the FWS cannot ignore available biological information or fail to develop projections of oil and gas activities which may indicate potential conflicts between development and the preservation of protected species. We hold that the FWS violated the ESA by failing to use the best information available to prepare comprehensive biological opinions considering all stages of the agency action, and thus failing to adequately assess whether the agency action was likely to jeopardize the continued existence of any threatened or endangered species, as required by section 7(a)(2). To hold otherwise would eviscerate Congress' intent to "give the benefit of the doubt to the species."³¹ [Footnote 31: H.R.Conf.Rep. No. 96-697, 96th Cong., 1st Sess. 12, reprinted in 1979 U.S.Code Cong. & Admin.News 2572, 2576.]...¹⁰⁵

Further, the idea that DOD is not intending to fund Fort Huachuca indefinitely is absurd. Former Defense Secretary Donald Rumsfeld addressed the long-term nature of military planning in 2004:

"The secretary wouldn't hazard a guess on how long the war on terror might last. The answer, he said, is as long as it takes. He said that if any world leaders at the end of World War II had tried to guess how long the Cold War would last, they likely would have been wrong. ...

Rumsfeld said he didn't know how long it would take to defeat terrorism. He noted it took more than four decades and perseverance on the part of presidential

¹⁰⁵ In its April 8, 2002, Order in *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al.*, CIV99-203 TUC ACM, 198 F. Supp. 2d 1139, April 8, 2002, pages 12-13.

administrations from both political parties to succeed in bringing down the Soviet Union."¹⁰⁶

Consistent with the fact that the Army has no intentions of limiting its activities at Fort Huachuca to ten years, the Army has lobbied for and secured \$208,877,000 in the last ten years alone for "Authorized Army Construction and Land Acquisition Projects" for Fort Huachuca.¹⁰⁷ Obviously, the Army is not investing almost \$209 million in construction and acquisition projects at Fort Huachuca merely for just a ten year stay. The Army is investing almost \$209 million at Fort Huachuca over the last ten years because it is planning on using the Base for a long time.

The BiOp's Programmatic Biological Assessment ("PBA")¹⁰⁸ rationalizes narrowing the consultation's evaluation to ten years because "[a]fter ten years, the uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process becomes considerably more difficult and uncertain." But then to rationalize this statement, the PBA says,

"However, planners in Arizona generally project water supplies and demands out to twenty years to plan for capital investments in water infrastructure to supply future population growth with water. The State of Arizona requires community water systems to develop System Water Plans that project water supplies and demands from 2010 to 2030 (ADWR 2011). In addition, modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River." [Pages G-13-14.]

Fort Huachuca's using of the State of Arizona's water policy for community water systems as rationale for an artificially narrowed evaluation window is sinister and particularly disingenuous. In fact, it is a lie by omission.

¹⁰⁶ "Rumsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense, September 9, 2004, http://www.defenselink.mil/news/Sep2004/h09092004_2004090909.html.

¹⁰⁷ National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110-181—JAN. 28, 2008 [\$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110-417—OCT. 14, 2008 [\$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111-84—OCT. 28, 2009 [\$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114-92—NOV. 25, 2015 [\$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114-328—DEC. 23, 2016 [\$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115-91—DEC. 12, 2017 [\$30,000,000].

¹⁰⁸ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24, Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

Fort Huachuca misrepresents the State of Arizona's water policy prowess knowing that (1) the State of Arizona requires that its developers provide proof that water will be available for 100 years in order to secure a permit to supply groundwater for their developments,¹⁰⁹ and (2) the State of Arizona does not follow the laws of physics and hydrology in evaluating the effects of the permitted wells' groundwater pumping on connected surface water when granting well permits for developers.¹¹⁰ FWS is well aware of these facts as well; yet, in the BiOp, FWS never questions the Base's cherry picking of an irrelevant State of Arizona policy in the PBA as the basis for Fort Huachuca's artificially narrowed evaluation window in the BiOp.

In addition, FWS' allowing Fort Huachuca to limit its analysis window to ten years, also ignores the Court's April 11, 2002, finding of fact on the short-term efficacy of a significant portion of the Base's claimed recharge mitigation credit, the City of Sierra Vista's wastewater treatment plant or the Environmental Operations Plant ("EOP"). BiOp at 168. On April 11, 2002, the Court found as a finding of fact that,

"This recharge project [the City of Sierra Vista's wastewater treatment plant] is not intended to compensate for or mitigate the effects of groundwater pumping. The project is designed to create a "mound" of groundwater between the cone of depression and the river that will, in theory, prevent baseflow from the San Pedro from flowing back into the groundwater during the next twenty years. (Admin. Rec. Ex. 5: Planning Aid Memorandum at 10.) [**38] This will delay and mask the effects of the deficit groundwater pumping, (Admin. Rec. Ex. 2: Final BO at 121), but this is not a mitigating factor in relation to the Army's ten-year plan."¹¹¹

The reason Fort Huachuca arbitrarily limited its analysis window to ten years is obvious when the Fort's hydrological footprint is examined objectively and beyond such an artificial window. The BiOp cites a GeoSystems Analysis (2010) study, "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca."¹¹² The BiOp, at 71 and 102, says,

"Recent groundwater modeling (GeoSystems Analysis 2010) suggests that effects from historical groundwater withdrawals in the regional aquifer (1940 to 2003; PBA Section 3.5.6) would result in reduced flows in the Babocomari River. Since the

¹⁰⁹ A.R.S. 45-108 Evaluation of subdivision water supply, definition ... I. For the purposes of this section, "adequate water supply" means both of the following: 1. Sufficient groundwater, surface water or effluent of adequate quality will be continuously, legally and physically available to satisfy the water needs of the proposed use for at least one hundred years.

¹¹⁰ Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Opinion in the Supreme Court of the State of Arizona, Robin Silver, M.D.; United States of America, U.S. Department of the Interior, Bureau of Land Managements; and Patricia Gerrodette, Plaintiffs/Appellees, v. Pueblo Del Sol Water Company, an Arizona Corporation; Thomas Buschatzke, in his Official Capacity as Director of the Arizona Department of Water Resources; Arizona Department of Water Resources, an Agency of the State of Arizona, Defendants/Appellants.; No. CV=16-0294-PR, filed August 9, 2018.

¹¹¹ Center for Biological Diversity, et al., Plaintiffs, v. Donald H. Rumsfeld, Secretary of Defense, et al., Defendants, Coalition of Arizona/New Mexico Coalition of Counties for Stable Economic Growth, Defendant-Intervenors, CIV 99-203 TUC ACM, UNITED STATES DISTRICT COURT FOR THE DISTRICT OF ARIZONA; 198 F. Supp. 2d 1139; 2002 U.S. Dist. LEXIS 7419; 54 ERC (BNA) 1391; 32 ELR 20640, April 8, 2002, Decided; April 11, 2002, Filed.

¹¹² "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

Babocomari River contributes flow to the San Pedro River upstream of the Tombstone gaging station, there is the potential that declines in Babocomari River baseflow could account for some portion of the declines in winter baseflow observed at the San Pedro River at the Tombstone gage."

GeoSystems Analysis (2010) is similarly cited in the BiOp, (at 293), in the Yellow-billed Cuckoo section, regarding the fact that "groundwater pumping has already negatively affected the Babocomari River flow." In addition, the BiOp, at 102, includes from GeoSystems Analysis (2010) a figure ("EB19") of "[s]imulated changes in stream discharges due to pumping from all wells in the upper San Pedro Basin."

Review of GeoSystems Analysis (2010), which was never given to FWS,¹¹³ however, reveals the primary and deceitful reason that Fort Huachuca and FWS limit the BiOp's evaluation window. GeoSystems Analysis (2010) shows that on-post and Fort-attributable groundwater pumping off-post are already and will into the future have negative effects on the San Pedro.

From GeoSystems Analysis (2010):

"Results reveal that simulated cumulative (1902-2105) on-post pumping comprises only 5% of basin-wide pumping, but it is responsible for 31% of baseflow capture, 3% of ET capture, and 4% of total storage depletion in the basin. All simulated Fort-attributable pumping (on and off post) comprises 19% of basin-wide pumping, and accounts for 65% of total baseflow capture, 7% of ET capture, and 21% of all storage depletion in the basin by 2105.

Simulated stream depletions related to Fort-attributable pumping are concentrated at the confluence of the Babocomari and San Pedro rivers, as well as several miles upstream on each river. Simulated stream depletions from on-post pumping only peak in the mid-21st Century, and including two 250-meter (820-foot) stream reaches that were "pumped dry" on the Babocomari in 2050. Total simulated Fort-related pumping (on- and off-post) dried out of a maximum of five stream reaches (1025 meters, 3363 feet) in 2050, and three reaches by the end of the simulation period in 2105." [Pages i-ii]

While simulated Fort-attributable pumping accounts for only 19% of total basin pumping from 1902-2105, the Fort's simulated impact on baseflow capture is again large relative to its total pumping, as indicated in Figure 17. The capture simulations estimate that 186,237 AF out of a total of 293,383 AF, or 63%, of captured baseflow in the USPB is caused by Fort-attributable pumping during the period 1902-2105. [Page 3-5]

Aquifer storage is by far the most important source of water for all simulated Fort-attributable pumping, both on and off post. Simulated on-post wells derive approximately 63% of all their pumped water from aquifer storage, 32% from stream baseflow capture, and 5% from ET capture (Figure 19). Roughly 79% of all simulated Fort-attributable pumping derives from aquifer storage, while 17% comes from stream baseflow capture, and 4% from ET capture (Figure 20). [Page 3-7]

In order to understand the spatial impacts of simulated Fort-attributable baseflow capture, pumping-induced changes in stream discharge (baseflow) were

¹¹³ Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

mapped for three discreet points in time: 2003, 2050, and 2105 (figures Figure 23 through Figure 25). ... [Page 3-10]

Figure 24 shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23, those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence.

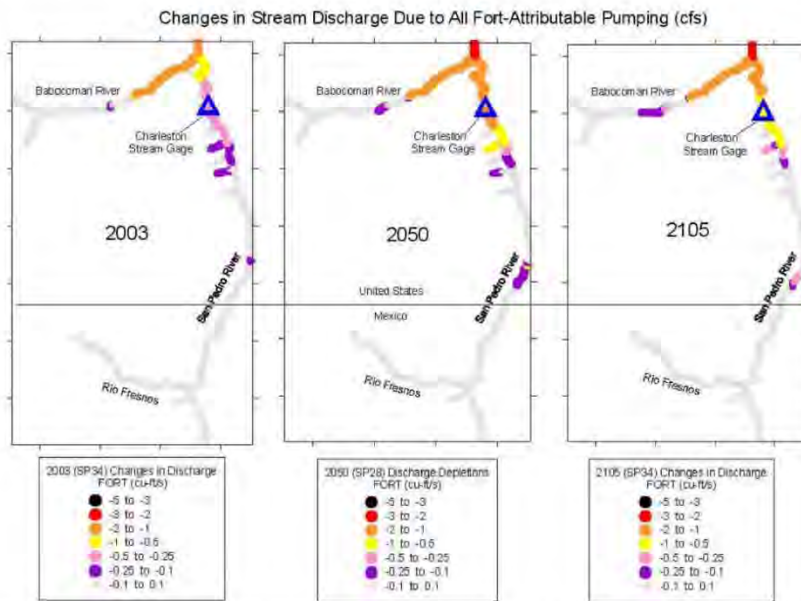


Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

... Figures 26-28 map the stream reaches that were simulated as having gone dry as a result of groundwater extractions from on-post wells, from all Fort-attributable pumping, and from all USBP wells, respectively. Figure 26 shows that in 2050, two reaches in the Babocomari were simulated as being “pumped dry” by on-post wells. ...

Figure 27 shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping. In this case, simulated Fort-attributable pumping produced two dry reaches in 2003, five in 2050, and three in 2105. ..." [Page 3-15]¹¹⁴

Stream Reaches Pumped Dry by FORT-Related Wells ON- and OFF-Post

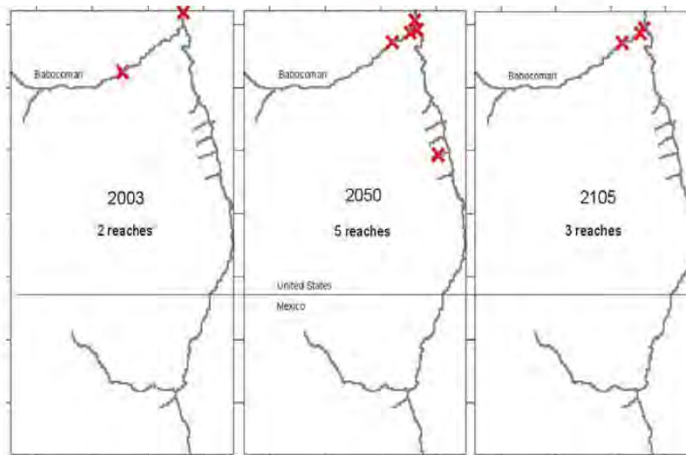


Figure 27. Stream Reaches Simulated as Being Pumped Dry by Fort-attributable Pumping On and Off post.

Opening of the evaluation window only to 2050 here reveals the Fort Huachuca-attributable damage to the San Pedro River and its Babocomari River tributary and the resulting jeopardy for the endangered species representative of and dependent on the San Pedro.

¹¹⁴ Ibid.

The dishonesty of narrowing the BiOp's evaluation window to 2012 – 2024 is further graphically illustrated by Integrated Hydro (2019). The BiOp illustrates its "no effect" finding in Figure 10 of PBA Appendix G:

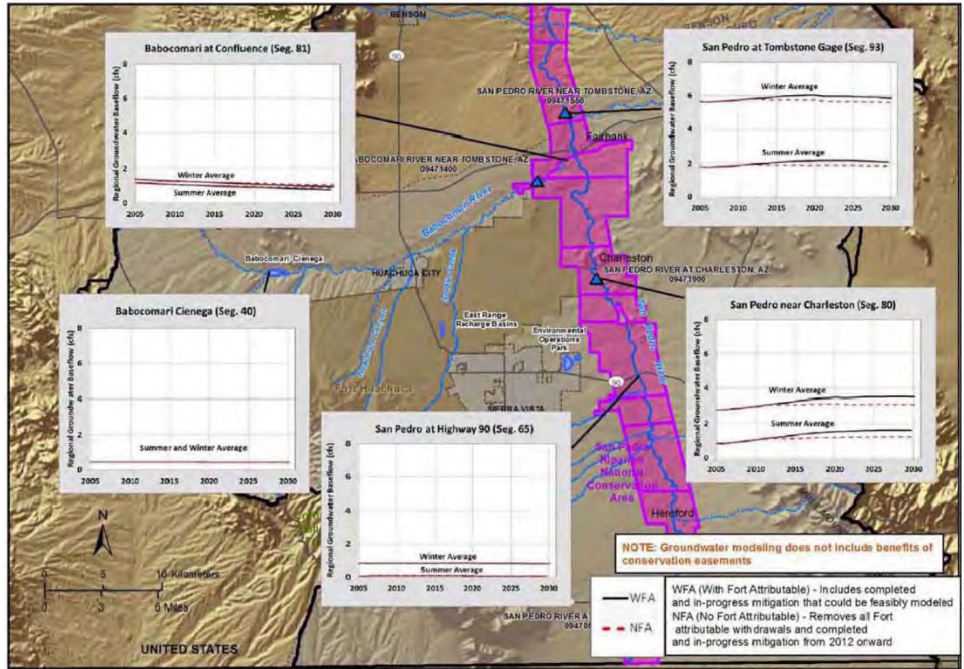


Figure 10. Simulated Regional Groundwater Baseflow for Locations in the Sierra Vista Subwatershed

Note how there is no negative change to 2030 in Figure 10 of the BiOp's PBA Appendix G.

But when Integrated Hydro (2019) opens the evaluation window beyond 2030, exposure of the resulting reduction in streamflow is dramatic at all four gaging stations:

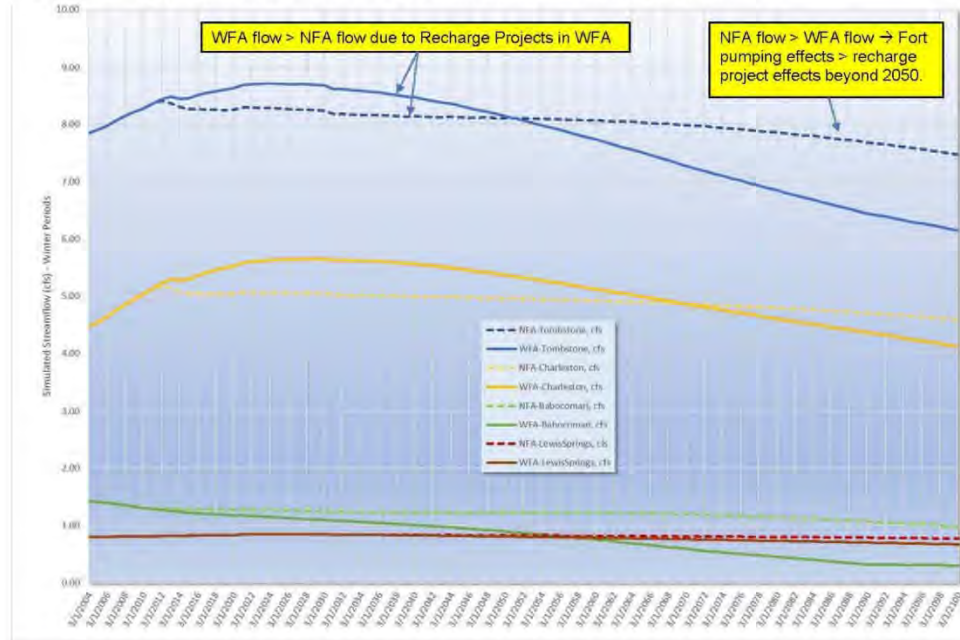


Figure 18. Simulated Streamflow and Change in Streamflow at Key Surface Flow Gages (see Figure 16 for locations).

Note that at the Tombstone gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052; at the Charleston gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2070; at the Babocomari gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2006; and at the Lewis Springs gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052.

Please also note that Integrated Hydro (2019) further qualifies its results noting "that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011. This is an important consideration described further in a study referenced in the 2014 PBA, App-G study (i.e., *GeoSystems Analysis, Inc (GSA). 2010a. Calculation of Pumping-Induced Baseflow and evapotranspiration Capture Attributable to Fort Huachuca. Prepared for Environmental and Natural Resources Division, Fort Huachuca. Collaborated with Vernadero Group Inc. November 2010*). Figure 13 in the GSA, 2010a study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San

Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."¹¹⁵

In terms of diminishing water levels (drawdown) from Fort Huachuca-attributable groundwater pumping, Integrated Hydro (2019) concludes,

"Simulated Fort-Attributable drawdown of groundwater levels (or drawdown) at year 2100 ... [d]rawdowns exceed 18 meters in the central high density pumping well [Fort Huachuca/Sierra Vista] area, 2 meters beneath, and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."¹¹⁶

It is obvious why Fort Huachuca not only covered up GeoSystems (2010), but why the Base and FWS narrowed the BiOp's evaluation window to 2014 – 2024 so as to avoid having to acknowledge Fort-attributable jeopardy to the San Pedro River and its representative and dependent endangered species.

D. The BiOp fails to include the effects of Fort Huachuca's pre-BiOp, attributable groundwater pumping in its hydrological modeling.

The BiOp fails to include the effects on the San Pedro River of Fort Huachuca's pre-BiOp attributable groundwater pumping. The amount of pre-BiOp Fort Huachuca groundwater pumping is graphically illustrated in GeoSystems (2010):

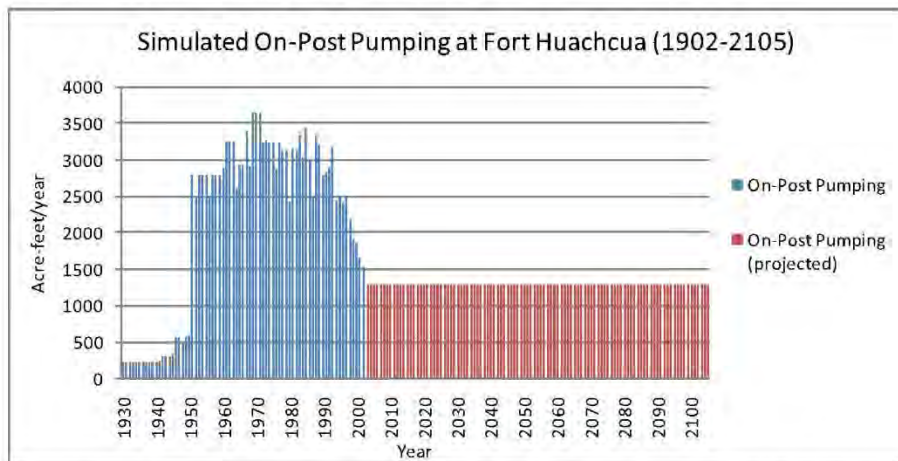


Figure 3. Simulated On-post Pumping at Fort Huachuca 1902-2105 (af/yr).

¹¹⁵ "Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100)" prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, Colorado, www.integratedhydro.com, November 21, 2019.; pages 4-5.

¹¹⁶ Ibid., page 13.

From GeoSystems (2010) Figure 3, the on-post groundwater pumping alone from 1950 – 2002 totals approximately 150,090 acre-feet cumulatively. The pre-BiOp numbers in GeoSystems (2010) come from Pool and Dickinson (2007)¹¹⁷ but Figure 3 does not include the total off-post Fort Huachuca-attributable groundwater pumping.

Total off-post Fort Huachuca-attributable groundwater pumping can be estimated from GeoSystems (2010) Figure 13 where off-post Fort-attributable groundwater pumping was estimated by GeoSystems (2010) from "estimated Fort-attributable population."¹¹⁸

GeoSystems (2010) Figure 13 shows "Simulated Cumulative Fort-attributable Pumping in USPB [Upper San Pedro Basin], 1902-2105.":

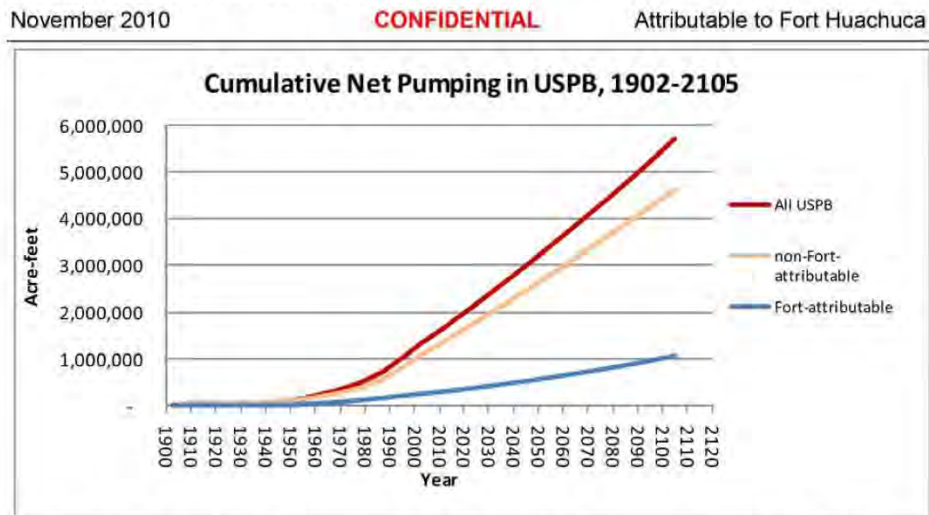


Figure 13. Simulated Cumulative Fort-attributable Pumping in USPB, 1902-2105.

From GeoSystems (2010) Figure 13, the cumulative Fort-attributable groundwater pumping debt in 2002 is approximately 300,000 acre-feet.

The BiOp should have included these cumulative totals in their models to fairly evaluate Fort Huachuca's effects on the San Pedro River and its representative and dependent endangered species as the detrimental effects of groundwater pumping continue long after the pumping stops.

But the BiOp does not include these cumulative totals in its models in spite of FWS' own words,

"Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

¹¹⁷ GeoSystems (2010) on page I, 1-1, and 1-4 cites Pool and Dickinson (2007) for "on post-pumping from 1902-2003: "Ground-Water Flow Model of the Sierra Vista Subwatershed and Sonoran Portions of the Upper San Pedro Basin, Southeastern Arizona, United States, and Northern Sonora, Mexico, in coop. with the Upper San Pedro Partnership and U.S. Bureau of Land Management." Pool, D.R. and J.E. Dickenson, U.S. Dept. of Interior, U.S. Geological Survey Scientific Investigations Report 2006-5228, 2007.

¹¹⁸ GeoSystems (2010), page i.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."¹¹⁹

To make the BiOp's failure to include the pre-BiOp pumping even more nefarious, GeoSystems (2010) also found that Fort Huachuca's deleterious pre-BiOp attributable groundwater pumping's effects were already apparent in 2003.¹²⁰ The BiOp does not reflect this GeoSystems (2010) finding.

GeoSystems (2010) Figure 24 for 2003 illustrates Fort Huachuca's pre-BiOp groundwater pumping effects:

Calculation of Pumping-Induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca **CONFIDENTIAL** November 2010

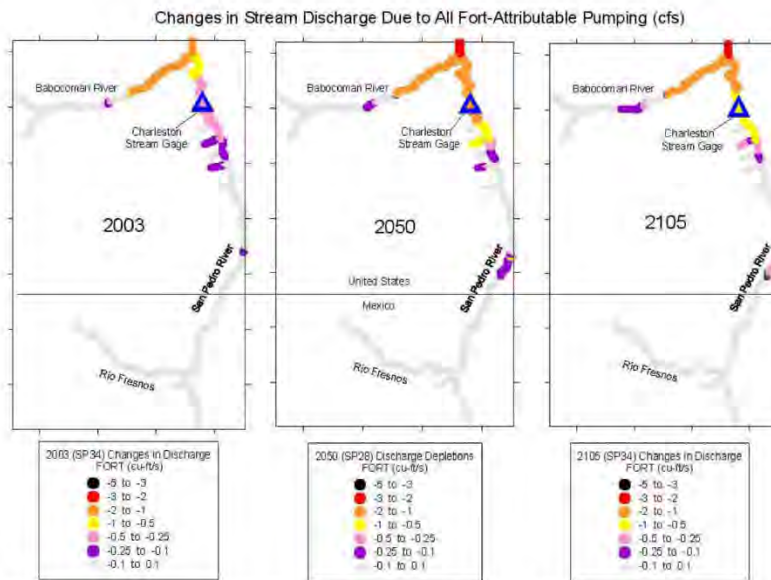


Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

¹¹⁹ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665. Water and Environmental Systems Technology, Inc. 911994) is: SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.

¹²⁰ Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, prepared by GeoSystems Analysis, Inc. November 2010; page 3-11 and 3-13.

Further, even if all groundwater pumping were stopped abruptly, the effects of the Fort Huachuca/Sierra Vista groundwater pumping does not stop.¹²¹ Specific to Fort Huachuca-attributable groundwater pumping, pre-BiOp effects will continue to negatively affect San Pedro River baseflow through the year 2088.¹²² The obvious reason that Fort Huachuca and FWS chose not to include the Fort's pre-BiOp attributable groundwater pumping in the BiOp evaluation is to artificially minimize and to obscure the true extent of Fort Huachuca's detrimental impact on the San Pedro River and its representative and dependent endangered species.

In spite of the fact that pre-BiOp Fort Huachuca-attributable groundwater pumping continues to harm the San Pedro River into the future through the year 2088,¹²³ the BiOp's hydrological modeling starts with data from 2003, while the BiOp's analysis of potential effects starts in 2011. The fact that the BiOp's hydrological modeling starts from 2003 is found in the BiOp's Biological Assessment Appendix G at G13 and G14:

"... to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [With Fort-attributable simulation] and the NFA [No Fort-attributable] simulations use the modeling period from 2003-2030."¹²⁴

In an attempt to hide even more of Fort Huachuca's harmful effects, the time window of the BiOp's evaluation of the effects of Fort Huachuca's effects on the San Pedro is narrowed even further in the PBA at 5-11 and in the BiOp at 20, 168 and 169:

"Analysis of the potential effects from Fort-attributable groundwater use was conducted using groundwater demand accounting of the Fort Huachuca activities in 2011. ... this consultation covers 2014 to March 31, 2024."

Ignoring the effects of Fort Huachuca's pre-BiOp pumping is arbitrary and capricious. It is not as if FWS didn't know already that Fort Huachuca's pre-BiOp groundwater pumping continues to capture groundwater that would otherwise end up as San Pedro River surface flow. FWS' January 6, 1997, Final rule of the Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, USFWS states:

"Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

¹²¹ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>.

¹²² U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix.

¹²³ Ibid.

¹²⁴ Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona Contract No. W91278-09-D-0099 Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, November 2013 ("PBA"); Appendix G, Groundwater Modeling Report at G-13 and G-14.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."¹²⁵

And FWS' August 23, 2002, Biological Opinion on Fort Huachuca's activities states,

"Interestingly, even if all groundwater pumping in Sierra Vista and Fort Huachuca ceased and agricultural pumping rates were fixed at 1988 levels, modeling showed that average annual flows would still decline at Charleston, Fairbank, and at Benson Narrows (WESTEC 1994). This would occur because over time the cone of depression is expected to flatten out, even if the volume of the cone is decreasing. As it flattens out, it could capture the base flow of the San Pedro River (C. Rovey, WESTEC, pers. comm., 1995). This indicates that balancing water use and water supply may not be enough to prevent capture of river base flow by the cone of depression." [page 95]

Table 9. Summary of groundwater and other modeling efforts in the upper San Pedro River basin, Arizona, that predicted future river flow or extent of riparian vegetation. ... Source ... *WESTEC (1994): This effort used the MODFLOW model with modifications by the authors. Outputs are annual average flows, which lump flood flows with base flows. Flows are modeled from 1988-2088.*; Scenario ... No pumping at the Fort/Sierra Vista after 1988, pumping in rural/agricultural areas at 1988 rates... Effects on upper San Pedro River flows or riparian vegetation ... Annual average flows decline at Charleston (42.7 cfs in 1988 to 41.5 cfs in 2088), at Fairbank (44.8 cfs in 1988, 43.6 cfs in 2088), at Benson Narrows (42.0 cfs in 1988 to 39.6 cfs in 2088) [page 97] ...

Even if enough conservation measures are implemented so water supply equals or exceeds water use, the cone of depression is expected to continue its lateral expansion as it flattens out and could dewater portions of the San Pedro River (see scenario 1 of WESTEC 1994, Table 9) [page 130]¹²⁶

"WESTEC 1994" is "San Pedro Hydrologic System Model, U.S. Bureau of Reclamation Scenarios by Water & Environmental Systems Technology, Inc. Specifically, WESTEC (1994) says,

"Scenario FWO-I assumed there is no future pumping in the Sierra Vista/Fort Huachuca area after 1988. ... This scenario predicts that even if all Sierra Vista area pumping were stopped, the cone of depression that is currently developed in the Sierra Vista area would not recover completely in 100 years.

River flows, however, continue to decline from an annual average of 42.7 cfs at Charleston in 1988 to 41.5 cfs in 2088. At Fairbank the modeled 1988 flow was 44.8 cfs compared with 43.6 cfs in 2088. ..."¹²⁷

¹²⁵ Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

¹²⁶ Biological Opinion on impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca (Fort), Arizona.; AESO/SE 2-21-02-F-229, 2-21-98-F-266, U.s. Fish and Wildlife Service, August 23, 2002.

¹²⁷ SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994; pages 13-14.

Graphs from WESTEC 1994 dramatically illustrate the fact that even if all groundwater pumping is stopped, the lowering of the water table continues towards the San Pedro River continuing the capture of groundwater that would otherwise supply surface water to the River:

Figure B-1

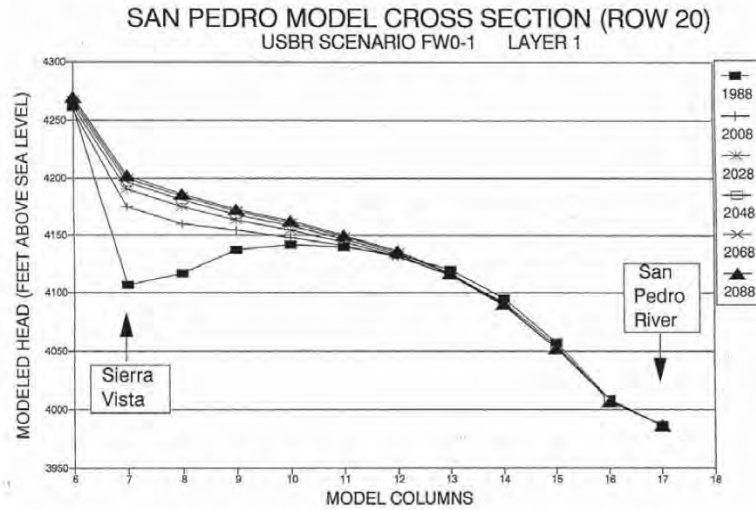
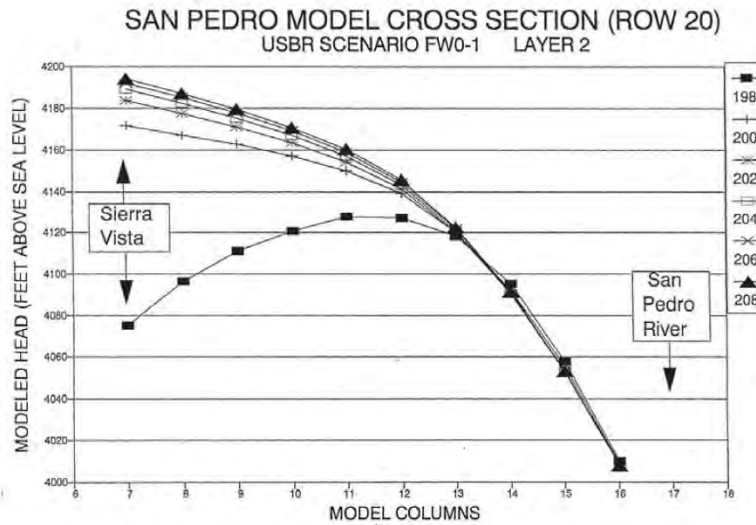


Figure B-2



The BiOp does tangentially mention pre-BiOp pumping effects,

"... groundwater withdrawals from all wells in the Upper San Pedro Basin from 1940 to 2003 are estimated to have caused the regional groundwater part of baseflow to decline 1 to 2 cfs in the Babocomari River. Declines in the regional groundwater component of baseflow in the Babocomari would have downstream effects in the San Pedro River at the Tombstone gage (PBA Section 3.5.3). The modeled San Pedro River baseflow at the Tombstone gage is calculated to have declined by 2 to 3 cfs due to groundwater withdrawals. ..." BiOp at 76.

The BiOp, however, does not assign pre-BiOp numbers and Fort Huachuca-attributable ownership to the withdrawals that caused the regional groundwater part of the baseflow to decline in the Babocomari and San Pedro Rivers.

In 2009, prior to production of the BiOp, Bredehoeft and Durbin (2009) address the phenomenon of the effects of groundwater pumping even after the pumping has been terminated. Bredehoeft and Durbin's "Ground Water Development – The Time to Full Capture Problem," says,

"The maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops. This is especially true if the monitoring is some distance away from the pumping. In addition, ground water systems will be very slow to recover to their predevelopment state once pumping is stopped. ...

If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."¹²⁸

Bredehoeft and Durbin (2009) are mentioned in the BiOp's PBA, but the PBA at G-13-14 attempts to deceptively use Bredehoeft and Durbin (2009)'s acknowledgement of "time-lag" to justify an artificially, and inappropriately abbreviated twenty-year planning and modeling period "for federal government activities":

"... modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River."

We addressed the fallacy of basing anything on a State of Arizona policy earlier; however, here we will address the BiOp's deceptive, intentional, misinterpretation of Bredehoeft

¹²⁸ "Ground Water Development – The Time to Full Capture Problem," j. Bredehoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x; 2009.

and Durbin (2009). Simply said, what Fort Huachuca conveniently fails to disclose is that the "time-lag" from Bredehoeft and Durbin (2009) is VERY long, not 18 years.

To illustrate from Bredehoeft and Durbin (2009) that "[t]he maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops," Bredehoeft and Durbin include Figure 9:

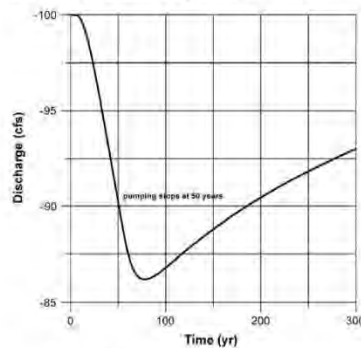


Figure 9. Predicted spring flow from a hypothetical aquifer (Figure 1 with phreatophytes in area 1 replaced by a spring). Pumping ceases after 50 years when the spring flow drops to 90 cfs.

Describing Figure 9, Bredehoeft and Durbin say,

"Figure 9 shows the discharge of our spring vs. time; pumping stopped in area 1 in approximately 50 years when the spring discharge dropped to 90 cfs. The minimum spring flow occurs at approximately 75 years, 25 years after we stopped pumping. The reduction in flow is 13 cfs—larger than what it was when we stopped pumping. The maximum drawdown at the spring, created by the pumping, takes 25 years after pumping stops to work its way through the system. We also see that the system does not recover readily to its predevelopment state even though the spring discharge equaled the recharge and was 100 cfs. Perhaps this is best understood if we look at the water removed from storage by the pumping and the rate at which it is replenished. During the period of pumping, the spring flow drops more or less linearly from 100 to 90 cfs. The amount of water removed from storage during this period averages approximately 95 cfs. The reduction in spring discharge averaged 5 cfs over the 50-year period—the capture of spring discharge averaged 5 cfs over the period. In other words, 95% of the ground water pumped during the 50 years of pumping came from storage. During the remaining 250 years since pumping stopped, the spring discharge averaged approximately 90 cfs. During that period, we are putting back in storage, on average, 10 cfs. This means that during the 250 years since the pumping ceased, we have restored just more than 50% of the water that was removed from the storage during the pumping period. You can easily see that this simple system will take approximately 500 years to return to its original state.

This hypothetical model illustrates the monitoring problem. If the monitoring point is some distance removed from the pumping, there will be (1) a time lag between the maximum impact and the stopping of pumping and (2) the maximum impact will be greater than what is observed when pumping is stopped (unless one has reached a

new equilibrium state during the pumping period). The time for full recovery of the system will be long, even in the case where one has not reached the new equilibrium.

The real world is more complex. Those that advocate monitoring seldom envision totally stopping the pumping; rather, they imagine changes in the development that minimize damages. Stopping the pumping is a management action of last resort and we showed that it has problems. Less stringent management actions have a correspondingly lesser beneficial impact and even more problems."

Bredehoeft and Durbin (2009) use the Southern Nevada Water Authority's ("SNWA's") desire to pump groundwater in eastern Nevada as the subject of their report. In their final discussion, Bredehoeft and Durbin (2009) say,

"We do not think that the SNWA development in Nevada is all that unique nor do we think that this is typically only a western problem. Large aquifer systems exist throughout the country and the world. The response time problem is typical of large systems; there are other developments where the hydrologic boundaries where capture can take place are far from the pumping. Long times will be involved before the system can reach a new equilibrium ..."

Bredehoeft and Durbin (2009) conclude,

"Some ground water systems in which a new equilibrium state that includes pumping can be achieved may take a long time to reach the new equilibrium. This is especially true where the discharge from the system that can potentially be captured by the pumping is a long distance away from the pumping center. Such a system may take more than a millennium, some more than two millennia, to reach the new equilibrium state. ... If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."

A "millennium" is quite a bit longer than the BiOp's PBA excerpting from Bredehoeft and Durbin (2009) "that there is a time-lag for groundwater systems" as justification for an extra 18 years of modeling as the BiOp's "simulations use the modeling period from 2003-2030."

In 2012, USGS authors Barlow and Leake discuss the time lag of the effects of groundwater pumping after stopping the pumping in even more detail. In "Stream flow depletion by wells – Understanding and managing the effects of groundwater pumping on streamflow," Barlow and Leake state:

"Common Misconceptions about Streamflow Depletion

An understanding of the basic concepts of streamflow depletion is needed to properly assess the effects of groundwater withdrawals on connected surface water and areas of evapotranspiration. Important concepts relating to depletion are available throughout this report and also in other literature, beginning with the paper, "The Source of Water Derived from Wells," by Theis (1940). In spite of these sources of information, misconceptions regarding factors controlling depletion are sometimes evident in analyses of depletion. This discussion highlights the following common misconceptions related to streamflow depletion. ...

Misconception 3. Depletion stops when pumping ceases. ...

Depletion after Pumping Stops

When a well begins to pump, water is removed from storage around the well, creating a cone of depression. As discussed previously, the cone of depression expands and can increase recharge to and discharge from the aquifer. If a well pumps groundwater for a period of time and then pumping ceases, groundwater levels will begin to recover and the cone of depression created by the pumping will gradually fill, with water levels eventually reaching positions that existed before pumping started (fig. 32). During the time that the cone of depression is filling, groundwater that otherwise would have flowed to streams instead goes into aquifer storage; thus, streamflow depletion is ongoing, even though pumping has ceased. The factors that control the rate of recovery are the same as those that affect the rate of groundwater-level declines in response to pumping—the geology, dimensions, and hydraulic conditions along the boundaries of the groundwater system, including the streams, and the horizontal and vertical distance of the well from the stream. ...

Some key points relating to depletion from a well or wells that pump and then stop pumping are as follows:

1. Maximum depletion can occur after pumping stops, particularly for aquifers with low diffusivity or for large distances between pumping locations and the stream.
2. Over the time interval from when pumping starts until the water table recovers to original pre-pumping levels, the volume of depletion will equal the volume pumped. ...
6. In many cases, the time from cessation of pumping until full recovery can be longer than the time that the well was pumped. ..."

Conclusions ...

Streamflow depletion after pumping stops: Streamflow depletion continues after pumping stops because it takes time for groundwater levels to recover from the previous pumping stress and for the depleted aquifer defined by the cone of depression to be refilled with water. The time of maximum streamflow depletion often may occur after pumping has stopped. Eventually, the aquifer and stream may return to their pre-pumping conditions, but the time required for full recovery may be quite long and exceed the total time that the well was pumped. Over the time interval from when pumping starts until the system fully recovers to its prepumping levels, the volume of streamflow depletion will equal the volume of water pumped. ..."¹²⁹

Besides inappropriately narrowing the evaluation window by deliberately misrepresenting the "time-lag" from Bredehoeft and Durbin (2009), the BiOp completely ignores that "the volume of depletion will equal the volume pumped," and "the volume of streamflow depletion will equal the volume of water pumped" from Barlow and Leake (2012). The BiOp fails to present and evaluate the total amount of pre-BiOp groundwater pumping attributable to Fort Huachuca that is still negatively impacting the San Pedro.

¹²⁹ *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, <https://pubs.usgs.gov/circ/1376/>.

In addition to GeoSystems (2010) pre-BiOp pumping documentation and modeling ignored in the BiOp discussed above, Fort Huachuca had other information documenting the amount of pre-BiOp groundwater pumping. Fort Huachuca's own "Statement of Claimant Form for Other Uses Amendment Superior Court of Maricopa County Federal Reserved Water Rights" says,

"Well pumpage from 1963 to 1984 has averaged 2,762 acre-feet per fiscal year. From 1982 to 1989 well production has averaged 2,830 acre-feet per calendar year"¹³⁰.

TABLE 5-58
FORT HUACHUCA
WELL PRODUCTION
(ACRE-FEET)

FISCAL YEAR		CALENDAR YEAR	
1963	2,887	1982	2,736
1964	2,471	1983	2,876
1965	2,636	1984	3,071
1966	2,703	1985	2,986
1967	3,021	1986	2,898
1968	2,909	1987	2,273 (excludes December)
1969	3,262	1988	3,021
1970	3,319	1989	2,601 (excludes October-December)
1971	3,174		
1972	3,148		
1973	2,781		
1974	3,351		
1975	2,597		
1976	2,766		
1977	2,871		
1978	2,327		
1979	2,624		
1980	2,836		
1981	2,996		
1982	2,597		
1983	2,928		
1984	3,105		

Source: Fort Huachuca letter concerning statements of claimant 39-10774 and 39-10775. October 17, 1989, enclosure 6, revised figures.

As we presented and discussed in the preceding section, Fort Huachuca's contractor, GeoSystems (2010) showed that the cumulative debt amount of pre-BiOp Fort-attributable on-post groundwater pumping 1950-2002 totals approximately 150,090 acre-feet¹³¹ and the on-post and off-post Fort-attributable groundwater pumping debt in 2002 totals approximately 300,000 acre-feet.¹³² This cumulative groundwater debt is not addressed and is not included in the BiOp

¹³⁰ Statement of Claimant Form for Other Uses' Amendment, Claimant Name: U.S. Army Intelligence Center and Fort Huachuca; Federal Reserved Water Rights; January 16, 2002.

¹³¹ GeoSystems (2010), Figure 3.

¹³² GeoSystems (2010), Figure 13.

evaluation. This omission from the BiOp violates the legal mandate to use the best available science.¹³³

E. **The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow.**

Such a concurrence fails to note FWS' own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,¹³⁴ Pupfish,¹³⁵ Spikedace¹³⁶ and Loach Minnow.¹³⁷



Loach Minnow (*Tiaroga cobitis*)

© Robin Silver

FWS' Recovery Plan for Loach Minnow states,

"Loach minnow is endemic to the Gila River basin of Arizona and New Mexico... Distribution in Arizona included the ... San Pedro River ... plus major tributaries...

Among streams from which loach minnow have been extirpated, Eagle Creek and San Pedro River, Arizona, represent those most amenable to reestablishment of the species. ... San Pedro River is the type locality for loach minnow (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for

¹³³ 16 U.S.C. § 1536(a)(2); *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

¹³⁴ Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii extimus*), USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

¹³⁵ Desert Pupfish (*Cyprinodon maularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

¹³⁶ Spikedace (*Meda fulgida*) Recovery Plan, USFWS, September 1991.

¹³⁷ Loach Minnow (*Tiaroga cobitis*) Recovery Plan, U.S. Fish and Wildlife Service, September 1991.

loach minnow; certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) also have potential for reestablishment of the species."¹³⁸



Spikedace (*Meda fulgida*)

© Robin Silver

FWS' Recovery Plan for Spikedace states,

"The species was abundant in the San Pedro River, Arizona ... Among streams from which spikedace have been extirpated, the San Pedro River system, Arizona, probably represents the most amenable, for several reasons, to its reestablishment. San Pedro River is the type locality for spikedace (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Eberhardt 1981, Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for spikedace, but also certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) may have potential for reestablishment of the species. ..."¹³⁹

¹³⁸ Ibid.

¹³⁹ Spikedace, *Meda fulgida*, Recovery Plan, prepared by Paul C. March, Arizona State University, Tempe, Arizona for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 30, 1991.



Desert Pupfish (*Cyprinodon macularius*)

© Robin Silver

FWS' Recovery Plan for Desert Pupfish states,

"Desert pupfish historically occupied the Gila River basin below about 1,500 meters (m) elevation in Arizona and Sonora, including the Gila, Santa Cruz, San Pedro, and Salt Rivers...

Re-established populations in Arizona will be located in the ... San Pedro...

The San Pedro River (BLM Riparian National Conservation Area, Cochise County, Arizona) should be considered a priority re-establishment site (as already recommended by Minckley (1987) for desert pupfish plus other extirpated native fishes), because it has high potential and is the type locality for the species. ..."¹⁴⁰

¹⁴⁰ Desert Pupfish (*Cyprinodon macularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.



Southwestern Willow Flycatcher (*Empidonax traillii extimus*) © Jim Burns

FWS' Recovery Plan for Southwestern Willow Flycatcher states,

" The historical range of the flycatcher in Arizona included portions of all major watersheds (H. Brown 1902 unpubl. data, Willard 1912, Swarth 1914, Phillips 1948, Unitt 1987). ... All of Arizona's major rivers and their tributaries where southwestern willow flycatchers were known to have bred have changed, often dramatically (Tellman et al. 1997). Rivers such as the Colorado, Gila, Santa Cruz, San Pedro, and Verde rivers have suffered extensive dewatering, and loss and fragmentation of riparian habitats. ...

Specific river reaches, within Management Units, where recovery efforts should be focused. Substantial recovery value exists in these areas of currently or potentially suitable habitat ... San Pedro River from international border to St. David (AZ) ..."¹⁴¹

It is not logical to conclude that Fort Huachuca will have no effect on species dependent upon the San Pedro for recovery when Fort Huachuca itself and its Base-attributable deficit groundwater pumping are jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

¹⁴¹ Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup, Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico; August 30, 2002.

F. **Fort Huachuca has failed to reinitiate consultation and FWS has failed to adopt its conference opinions following the listing of the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo.**

Since release of the BiOp, the Northern Mexican Gartersnake has been added to the federal list of endangered species. On July 8, 2014, the Northern Mexican Gartersnake was added to the federal list of endangered species.¹⁴²



Northern Mexican Gartersnake (*Thamnophis eques megalops*) © Andy Holycross

FWS' Listing Notice for Northern Mexican Gartersnake states,

"Records documenting northern Mexican gartersnake exist within the following subbasins in Arizona: ... San Pedro River ...

Despite the loss or modification of aquatic and riparian habitat, large reaches of the ... San Pedro ..., as well as several of their tributaries, remain functionally suitable as physical habitat for either gartersnake species [both the Northern Mexican Gartersnake and the Narrow-headed Gartersnake were listed in the same Notice]. ...

The arid southwestern United States is characterized by limited annual precipitation, which means limited annual recharge of groundwater aquifers; even modest changes in groundwater levels from groundwater pumping can affect above-ground stream flow as evidenced by depleted flows in the ... San Pedro ... as a result of regional groundwater demands (Stromberg *et al.* 1996, pp. 113, 124–128; Rinne *et al.* 1998, p. 9; Voeltz 2002, pp. 45–47, 69–71; Haney *et al.* 2009 p. 1). Groundwater

¹⁴² Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.



Yellow-billed Cuckoo(*Coccyzus americanus*) © Robin Silver

The largest population of Yellow-billed Cuckoo in the western United States.¹⁴⁶
"Perhaps 30 percent of the western U.S. population of Yellow-billed Cuckoos breed" in the San Pedro Riparian National Conservation Area."¹⁴⁷ At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River.¹⁴⁸

FWS' Listing Notice for Yellow-billed Cuckoo states:

"Upper San Pedro River—This site has had the largest yellow-billed cuckoo population in Arizona. ...

The San Pedro Riparian National Conservation Area (NCA) encompasses approximately 40 mi (64 km) of the upper San Pedro River meanders. It was designated by Congress in 1988 with its primary purpose to protect and enhance the desert riparian ecosystem as an example of what was once an extensive network of similar riparian systems throughout the American Southwest. It contains nearly 57,000 ac (23,077 ha) of public land between the international border with Mexico and St. David, Arizona, and supports one of the largest western yellow-billed cuckoo populations in Arizona. However, continually increasing demands for water use within the basin threatens future flow in the upper San Pedro River. The 2011 District of Arizona case, *Center for Biological Diversity, et al. v. Kenneth Salazar, et al.*, CV 07-484- TUC—AWT, ruled that the 2007 plan by the U.S. Army and U.S. Fish and Wildlife Service failed to protect the upper San Pedro River or properly analyze Fort

¹⁴⁶ Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.; Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

¹⁴⁷ National Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine, Vol. 104, No. 5; December 2002.

¹⁴⁸ Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.

Huachuca's ground water pumping effect on the ecosystem's endangered species and critical habitat."¹⁴⁹

The proposal for Critical Habitat for Yellow-billed Cuckoo says:

"This unit [Upper San Pedro River] has one of the largest remaining breeding groups of the western yellow-billed cuckoo and is consistently occupied by a large number of pairs. The site also provides a movement corridor for Western yellow-billed cuckoos moving farther north."¹⁵⁰

The law requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize survival and recovery of the Yellow-billed Cuckoo.¹⁵¹ Fort Huachuca has not done so in spite of the fact that the Base's activities are jeopardizing the survival and recovery of this species. Fort Huachuca's failure to consult with FWS violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Section 7(a)(4) mandates that an action agency "confer" with FWS on any action that is "likely to jeopardize the continued existence" of any "species proposed to be listed" or is "likely to result in the destruction or adverse modification of critical habitat proposed to be designated for such species." 16 U.S.C. § 1536(a)(4); 50 C.F.R. § 402.10. Although not required, agencies can request that the conference "be conducted in accordance with the procedures for formal consultation." 50 C.F.R. § 402.10(d). The final product of such a conference is called a conference opinion. Consultation Handbook at 6-4.

If a proposed species is later listed, or its critical habitat is formally designated, the action agency has two options. First, it can request in writing that FWS adopt the conference opinion as a BiOp. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-6. However, FWS may only adopt the opinion so long as "no significant new information is developed . . . and no significant changes to the Federal action are made." If the opinion is adopted as a BiOp, any incidental take statement that was provided with the conference opinion may take effect—but not before then. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-4. If FWS does not adopt the conference opinion as a BiOp, the action agency *must* pursue its second option and reinitiate consultation pursuant to 50 C.F.R. § 402.16(d) (requiring reinitiation of formal consultation if a "new species is listed or critical habitat designated that may be affected by the identified action"); *see also* BiOp at 369 (noting "reinitiation of formal consultation is required where . . . a new species is listed or critical habitat designated that may be affected by this action"). Either way, formal consultation is not concluded until FWS issues a BiOp. 50 C.F.R. § 402.14(1)(1).

Here, when FWS issued the Fort Huachuca BiOp and Conference Opinion on May 16, 2014, the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo were proposed for listing, and FWS had proposed critical habitat for the Gartersnake. FWS incorporated conference opinions for these species into its BiOp, along with a provisional incidental take statement for the gartersnake. BiOp at 252, 276–80. Less than two months later, FWS published a final rule listing the gartersnake as threatened. Endangered and Threatened Wildlife and

¹⁴⁹ Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule, U.S. Fish and Wildlife Service, Federal Register Vol. 78 Page 61622, October 3, 2013.

¹⁵⁰ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo; Proposed Rule; U.S. Fish and Wildlife Service; Federal Register Vol. 79 Page 48548.

¹⁵¹ 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

Plants; Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, 79 Fed. Reg. 38,678 (July 8, 2014). Shortly thereafter, FWS also listed the western distinct population segment of the Yellow-billed Cuckoo as threatened. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), 79 Fed. Reg. 59,992 (Oct. 3, 2014).

By the end of 2014, the Fort requested that FWS adopt the conference opinions for the Gartersnake and Cuckoo as a BiOp. Phone call with FWS Tucson Field Office (July 16, 2019). But although the Consultation Handbook gives FWS 45 days after an action agency's request to adopt a conference opinion as a BiOp, here FWS has not acted in nearly five years. Consultation Handbook at 6-6. Enough time has passed since the Fort's request for FWS confirmation—roughly 1,800 days—that FWS can no longer be certain that “no significant changes have occurred in the proposed action or the information used in the conference.” *Id.*; see also Alex Devoid, *A rancher and an ecologist hike the desert, hunting for water and common ground on the San Pedro River*, Arizona Republic, Jan. 7, 2019¹⁵² (reporting a long-term drought in the San Pedro region, making 2018 one of the three driest rivers for the Babocomari since mapping began in 2007). Moreover, the Fort never reinitiated consultation pursuant to 50 C.F.R. § 402.16(d), as it should have based on the length of time that has passed since the species were listed. A new interagency consultation for the Gartersnake and Cuckoo is the only way to assess the Fort's impacts to these species' continued existence. See *id.*

In sum, the agencies have failed to complete formal consultation on an action which the Fort already recognized may adversely affect both the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo. PBA at 5-28, 5-39. Moreover, because the 2014 conference opinions were never confirmed, the provisional incidental take statement issued for the gartersnake never took effect. See BiOp at 276–79; 50 C.F.R. § 402.10(d). This means the Fort has been operating for five years in a manner FWS already recognized would likely result in the take of ten Northern Mexican Gartersnakes over the course of the 10-year action period. See BiOp at 276 (issuing provisional incidental take statement for ten Northern Mexican Gartersnakes over the 10-year life of the project due to baseflow reductions in the lower Babocomari). Even assuming the Fort has not already violated section 9's take prohibition, the Fort's failure to consult violates section 7 of the ESA, 50 C.F.R. § 402.10(d), and 50 C.F.R. § 402.16(d).

G. Recharge Basins are not providing as much water as anticipated in the BiOp. New Climate Change science since release of the BiOp means that even less recharge can be anticipated. This new information requires Reinitiation of Consultation.

Fort Huachuca claims credit from a series of on-post recharge basins in the BiOp (at 168) for Stormwater Capture ("C2") and East Range recharge ("C3") (BiOp at 168), and claims credit off-post for the Palominas Pilot Stormwater Recharge Project ("F2") (BiOp at 169); however, the recharge basins are not providing the amount of recharge as planned.¹⁵³ The BiOp

¹⁵² Available at <https://www.azcentral.com/story/news/local/arizona-environment/2019/01/07/looking-common-ground-ailing-san-pedro-river-arizona/2447483002/>.

¹⁵³ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date

at 168 claims 108 acre-feet per year from 2013 – 2022 for on-post Stormwater Capture ("C2"); however, Fort Huachuca's Annual Reports show totals of 61.6, 59, 27, and 27 acre-feet per year respectively for years 2015, 2016, 2017, and 2018.¹⁵⁴ This represents 60% less recharge for the last four years than anticipated in the BiOp for on-post credit for Stormwater Recharge.

The BiOp at 168 claims 368 acre-feet per year for on-post East Range Recharge ("C3") from 2013-2022; however, Fort Huachuca's Annual Reports show totals of 185, 187, 209, 155, and 246 for years 2015, 2016, 2017, and 2018, respectively.¹⁵⁵ This represents 47% less recharge for the last five years than anticipated in the BiOp for on-post East Range Recharge credit.

The BiOp at 30 and 169 counts the off-post Palominas Pilot Stormwater Project ("F2") for 98 acre-feet per year starting in 2015; however, the June 19, 2019, Cochise Conservation and Recharge Network report to the USPP Technical Committee reveals that the Palominas Recharge facility recharged only 9.7 and 10.2 acre-feet per year respectively in years 2017 and 2018.¹⁵⁶ This represents 90% less recharge for the two years for which data is available than anticipated in the BiOp for the Palominas Recharge facility.

According to the best available climate, the recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and mentioned here, and ultimately, also "Incidental Recharge" claimed by the Base (BiOp at 168), will be diminished further in the future.¹⁵⁷ The American Southwest is getting hotter and drier.¹⁵⁸ Climate models project that precipitation and soil moisture in the

unknown; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

¹⁵⁴ Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

¹⁵⁵ Ibid.

¹⁵⁶ Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

¹⁵⁷ Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN.; Scager, R., T. Mingfang, L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: 482-486.

¹⁵⁸ Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45 (pp. 186-190); Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (pp.231, 238).

Southwest will continue to decrease.¹⁵⁹ Global warming driven by rising greenhouse-gas concentrations is expected to cause a steady drop in precipitation over the American Southwest by 2040 leading to declines in surface water availability.¹⁶⁰

Arizona generally has already become both hotter and drier.¹⁶¹ Specifically, in nearby Tucson, where substantial data is available, year-round temperatures are increasing and precipitation is diminishing.¹⁶²

H. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area¹⁶³ will be increasing by 61.9 % since the BiOp from -1,453 acre-feet per year¹⁶⁴ to approximately -2,325.2 acre-feet per year.¹⁶⁵ This new information requires reinitiation of consultation.

Fort-attributable, San Pedro River-damaging deficit groundwater pumping has significantly increased since the BiOp. Since production of the BiOp, the San Pedro's vulnerability and risk of harm from the Base's pumping has increased dramatically as Fort Huachuca-attributable, unmitigated, deficit groundwater pumping is now 1,172 acre-feet per year greater, 61.9% greater, than the amount assumed in the BiOp.¹⁶⁶ BiOp at 141, 160, 163, 169, and 304.

¹⁵⁹ Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J01I993CC (p. 217); Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN (pp. 231, 238).

¹⁶⁰ Seager, R., T. Mingfang, L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change* 3: p. 482.

¹⁶¹ National Oceanic and Atmospheric Administration National Centers for Environmental information, City Time Series, published October 2019, retrieved on October 22, 2019 from <http://www.nedc.noaa.gov/cag/>.

¹⁶² Ibid.

¹⁶³ Sierra Vista Subbasin.

¹⁶⁴ BiOp at 80, 85, 154, and 169.

¹⁶⁵ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin". Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁶⁶ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin". Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.; Wells 55 Registry, downloaded from

The BiOp bases its water budget upon a net yearly Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) This deficit of 4,600 acre-feet/year comes from the Upper San Pedro Partnership ("USPP") report from 2013.¹⁶⁷ BiOp at 141 and 160.

USPP is "[a] consortium of agencies and organizations working together to meet the long-term water needs of the Sierra Vista Subwatershed by achieving sustainable yield of the regional aquifer to: 1) preserve the San Pedro Riparian National Conservation Area (SPRNCA), and 2) ensure the long-term viability of Fort Huachuca."¹⁶⁸ Fort Huachuca is a USPP member.

In 2003, USPP promised to "balance the local water budget by 2011"¹⁶⁹ in order to secure a special legislative environmental law exemption for Fort Huachuca¹⁷⁰ to protect the base from downsizing in the 2005 Base Realignment and Closure round. The legislative exemption was necessary at the time because, in Fort Huachuca's lawyer's own words,

"Development over the last decade has overburdened water resources. The region is now facing an escalating groundwater deficit, with underlying aquifer being drained beyond its capacity for recharge. Declining water levels are adversely affecting critical habitat and several endangered species in the San Pedro Riparian Area. ...

In 1998, the USFWS issued a draft BO, which preliminarily concluded that the Army's proposed action (Fort Huachuca's ongoing and programmed activities and accompanying conservation measures), were "likely to jeopardize" the existence of the Huachuca Water Umbel, the Southwestern Willow Flycatcher and "likely to adversely modify" the critical habitat of the Flycatcher [Yellow-billed Cuckoo, and Northern Mexican Gartersnake were not yet listed as endangered]. ...

On 11 April 2002, the U. S. District Court, District of Arizona, issued an order granting CBD's motion for summary judgment/declaration judgment, finding the absence of a factual and rational basis to support the no-jeopardy BO ("The Defendants [Army and USFWS] admit that even if all of the mitigation measures included in the Final BO, are taken together and under the best case scenario, water use in the aquifer will exceed supply and result in continuing growth in the already very large cone of depression under Fort Huachuca and Sierra Vista, until groundwater pumping is balanced in the region." (Court's Opinion at pages 16-17). The court ruled that the USFWS must address the regional water deficit and impose specific mitigation measures (Reasonable and Prudent Alternatives) on Fort Huachuca designed to achieve a no-jeopardy situation. ...

Representative Renzi's amendment to H.R. 1835 proposes to limit the consideration of civilian, off-post water in future ESA consultations conducted by

<https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁶⁷ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.

¹⁶⁸ <http://uppersanpedropartnership.org/mission-goals/>

¹⁶⁹ "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

¹⁷⁰ Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

military installations. It is unclear whether the scope of this amendment is broad enough to preclude the consideration of "cumulative effects," which are future state and private activities, not part of the federal action that are reasonably certain to occur. Having to consider and mitigate for cumulative effects under the ESA continues to be a major problem for Fort Huachuca."¹⁷¹

With Senator John McCain's help,¹⁷² Representative Rick Renzi was able to secure passage of the special legislative environmental law rider exemption for Fort Huachuca so that the Base would not have to consider the surrounding area's environmental baseline in any evaluation of Fort Huachuca's activities.¹⁷³ But as a quid quo pro for passage of the legislative exemption, USPP, including Fort Huachuca, promised to "balance the area's water deficit by 2011."¹⁷⁴

The September 13, 2003, Sierra Vista Herald's "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit" reports:

"In the resolution, the group, which is a consortium of federal, state and local agencies, businesses and environmental groups, says its members will balance the area's water deficit by 2011... The object of the resolution is to ensure the fort has the support it needs to survive the next Base Realignment and Closure round.

"Strain [Sierra Vista mayor pro tem Bob Strain], the chairman of the partnership's Advisory Commission, said that can only be done with a commitment by the off-post communities to be part of the water use solution."

Fort Huachuca's Garrison Commander stressed the importance of balancing the area's water deficit by 2011 in the Sierra Vista Herald on February 4, 2006. In "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

"FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

¹⁷¹ "INFORMATION PAPER; SUBJECT: District Court Decision on Fort Huachuca's Biological Opinion; Purpose: To provide information on the 11 April 2002, U.S. District Court decision regarding the U.S. Fish and Wildlife Service's (USFWS) Final Biological Opinion (BO) on Fort Huachuca's activities and water usage."; Colonel Teller, JALS-EL 12 May 2003.

¹⁷² Op Ed: "Republicans should save environment," John McCain, November 27, 1996:

"Public skepticism that Republican share Americans' environmental values raise an important question. Have Republicans abandoned their roots as the party of Theodore Roosevelt, who maintained that government's most important task, with the exception of national security, is to leave posterity a land in better condition than they received it?

The answer must be no. But if we are to restore the people's trust and retain the privilege of serving as the majority party, we better start improving it. ... Too often the public views Republicans as favoring big business at the expense of the environment ... killing the patient is a lousy way to treat the disease and squanders our credentials as reformers while adding substance to our critics' accusations of extremism. ... our nation's continued prosperity hinges on our ability to solve environmental problems and sustain the natural resources on which we all depend."

Press Release, "Statement of Senator John McCain Bill to Authorize Two Base Realignment Closure Rounds to Occur in 2003 and 2005," Senator John McCain, August 23, 2002 and November 4, 2002:

"I urge my colleagues to join us in support of this critical bill and to work diligently throughout the year to put aside local politics for what is clearly in the best interest of our military forces.";

¹⁷³ Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

¹⁷⁴ "USPP's resolution called a 'bold step,' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ...

Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.

While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.

What is unrecognized by many is "we didn't do well in some areas," Hunter said.

One area of concern of water...

With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said.¹⁷⁵

USPP reiterated its promise in its 2005 through 2011 reports:

"...the Secretary of the Interior shall prepare, in consultation with the Secretary of Agriculture and the Secretary of Defense and in cooperation with the other members of the Partnership, a report on water use management and conservation measures that have been implemented and are needed to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011."¹⁷⁶

¹⁷⁵ "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 6, 2004.

¹⁷⁶ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2004 Report to Congress, Upper San Pedro Partnership, March 30, 2005.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2005 Report to Congress, Upper San Pedro Partnership, 2006.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2006 Report to Congress, Upper San Pedro Partnership, 2007.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2007 Report to Congress, Upper San Pedro Partnership, 2008.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2009 Report to Congress, Upper San Pedro Partnership, May 2011.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2010 Report to Congress, Upper San Pedro Partnership, May 2012.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

Predictably, though, the Upper San Pedro Partnership, including Fort Huachuca, failed to keep its promise to “balance the local water budget by 2011.” In their 2012 report (USPP 2014), USPP admits:

“...the Partnership has fallen short of the goal set by Congress to achieve sustainable yield (defined by the Partnership as erasing the water budget deficit) by September 30, 2011.”¹⁷⁷

The BiOp states that “[t]he Fort is no longer contributing to the groundwater deficit.” (BiOp p. 166, 275.) This statement is false.

The Fort-attributable, unmitigated, deficit groundwater pumping in the BiOp is -1,453 acre-feet per year for 2011 (BiOp at 80,85, 154, and 169). And this inappropriately includes 299 acre-feet per year credit for “avoided future pumping” for the Babocomari Area Conservation Easement (BiOp at 28, 168) The new Fort-attributable deficit since the BiOp is now approximately 2,325.2 acre-feet per year.¹⁷⁸ This is now -1,172 acre-feet per year greater than the amount assumed in the BiOp,¹⁷⁹ (BiOp at 141, 160, 163, 169, and 304) which is an increase of at least 61.9% in unmitigated, deficit groundwater pumping since production of the BiOp.

The BiOp assumes a Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) The BiOp subsequently arrives at its Fort-attributable deficit groundwater pumping of -1,453 acre-feet per year (BiOp at 80,85, 154, and 169). The BiOp’s total of -1,453 acre-feet per year, however is not accurate as the BiOp inappropriately assigns the Base credit for 299 acre-feet per year from “avoided future pumping” for the Babocomari Area Easement. BiOp at 169 and Biological Assessment (“BA”) Appendix D Mitigation Measures Plan at 2. The BiOp credits Fort Huachuca with the 299 acre-feet per year for the Babocomari Area as it is from “avoided future pumping” for the Babocomari Area Easement in spite of the fact that the BiOp at 294, itself, states that “[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired.”¹⁸⁰ Consequently, the correct 2011, Fort-attributable, unmitigated groundwater pumping should have been -1,752 acre-feet per year in the BiOp. (1,453 + 299 = 1,752). The new Biological Opinion will need to correct this error.

¹⁷⁷ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

¹⁷⁸ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company’s Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, “Groundwater Subbasin”, downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁷⁹ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company’s Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, “Groundwater Subbasin”, downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017..

¹⁸⁰ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. (“BiOp”), page 294.

USPP (2014) reports that the area's total aquifer overdraft is -5,100 acre-feet per year.¹⁸¹ This is higher than the BiOp's total aquifer overdraft of -4,600 acre-feet per year from USPP (2013). The BiOp's hydrological data is from "2011, 2012, and preliminary numbers from 2013." (BiOp at 4.) The USPP report (2014) is based on data through 2012.

In addition, since release of USPP (2014), an additional 3,302.35 acre-feet per year of future groundwater extraction for the build out of the proposed 7,000 house, Pueblo del Sol Tribute development in Sierra Vista has been approved by the City of Sierra Vista and the Arizona Department of Water Resources ("ADWR");¹⁸² and an additional 369 new non-monitoring wells have been permitted in the Sierra Vista Subbasin by ADWR from January 1, 2012 through November 11, 2019.¹⁸³

Approximately forty percent of all off-post deficit groundwater pumping in the area is attributable to Fort Huachuca. (BiOp at 28, 153, 154 and 156.) We calculate new Fort Huachuca-attributable San Pedro River-killing deficit groundwater pumping of -2,325.2 acre-feet per year since production of the BiOp by (1) using 40% of the latest deficit figure from USPP (2014) of -5,100 acre-feet per year which equals -2,040 acre-feet/acre; (2) by using 40% of the new -3,302 acre-feet per year approved by the City of Sierra Vista and ADWR for the Pueblo del Sol development which equals -1,321 acre-feet per year; and (3) and by assigning 40% of the 93 acre-feet per year of groundwater pumped by 369 new non-monitoring Sierra Vista subwatershed wells permitted from January 1, 2012 through November 11, 2019 by ADWR. We calculate the 37.2 acre-feet/year of groundwater from the new wells by assuming one home per well and by using the USGS average use per well value of 0.252 acre-feet per year¹⁸⁴ ($369 \times 0.252 = 93$, $93 \times .40 = 37.2$). We note that of these 369 newly permitted wells, 40 are permitted as "non-exempt" wells to pump which may pump more than 35 gallons per minute ("gpm") or more than 56 acre-feet per year. These are obviously not for single home use and will pump much more than the less than 35 gpm each for the permitted exempt wells. An exact new groundwater pumping total will need to be calculated, adjusted, and added to Fort-attributable, deficit groundwater pumping in the new Biological Opinion to account for the newly added non-exempt groundwater pumping wells. We reduce the Fort's attributable deficit by 1,073 acre-feet of actual retired groundwater pumping from the Clinton Drijver farms (BiOp at 169). We do not give the Fort credit for their "avoided future" pumping consistent with FWS' own policy "that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."¹⁸⁵

Specific to the newly permitted, unmitigated deficit groundwater pumping by the Pueblo del Sol Tribute development, the callousness and the arrogance and lack of concern for Fort

¹⁸¹ Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

¹⁸² Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.

¹⁸³ Wells 55 Registry, downloaded from <https://new.azwater.gov/gis> on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from <http://gisdataazwater.opendata.arcgis.com/> on March 17, 2017.

¹⁸⁴ Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, U.S. Department of the Interior U.S. Geological Survey, Scientific Investigations Report 2016-5114, Version 1.3, April 2019, page 30.

¹⁸⁵ U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

Huachuca is epitomized by the November 29, 2012, testimony, under oath, of Richard S. Coffman, Senior Vice President of Castle & Cooke Arizona, owner of Pueblo Del Sol Water Company and the Tribute Development in Sierra Vista. Even though approximately 40% of the inhabitants of the Tribute development are Fort Huachuca-attributable employees, retirees and or contractors, the lack of concern for Fort Huachuca's water problem is gripping:

"Q. Okay. And you testified that there are plans built into the master plan for harvesting and reuse of water. Is it correct that those plans include using most of that water for watering the landscaping with the subdivision?

A. Yes.

Q. And that water is - - and that water therefore would not be available for recharge to the aquifer?

A. That's correct, except insofar as there is some incidental recharge through the landscaping efforts. ...¹⁸⁶

We harken back to ACOE's July 1970 prophetic observation that in July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

"... The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately owned area. ..."¹⁸⁷

And Fort Huachuca Garrison Commander Hunter's observations on February 4, 2006, in the Sierra Vista Herald's "Garrison commander says water is a threat to fort,"

FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. ...

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. ..."¹⁸⁸

Because the City of Sierra Vista, Cochise County, the State of Arizona, ADWR, and local developers like Castle & Cooke have failed to sufficiently help Fort Huachuca in controlling the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, alone and abandoned, must now remove the Fort-attributable the jeopardy facing the San Pedro River and its representative and dependent endangered species by Fort Huachuca.

¹⁸⁶ In the Matter of the Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as having an Adequate Water Supply No. 40-700705.0000.; Docket No. 12A-AWS001-DWR; Pueblo Del Sol Hearing Volume IV 11-29-2012 Transcribed from an Audio Recording pages 694-5.

¹⁸⁷ "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

¹⁸⁸ "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 4, 2006.

CONCLUSION

The BiOp's (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation of its analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [16 U.S.C. § 1536(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Fort Huachuca's failure to consult with FWS to prevent jeopardizing Yellow-billed Cuckoo and Northern Mexico Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Fort Huachuca's and FWS' violate the law because of their failure to reinstate consultation based on new information available since the BiOp that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated, (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; and (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

Because the City of Sierra Vista, Cochise County, the State of Arizona and local developers have failed to help Fort Huachuca with control of the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, must take responsibility for the fact that the Base is jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

In sixty days, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, will seek judicial relief as well as attorney fees and costs, if you have not taken corrective action to stop the multiple violations of law documented in this Notice. 16 U.S.C. § 1540(g)(2)(A)(i).

If you have any questions, please contact, Dr. Robin Silver, via MAIL: Center for Biological Diversity, P.O. Box 1178, Flagstaff, AZ 86002; PHONE: (602) 799-3275; or EMAIL: rsilver@biologicaldiversity.org.

Sincerely,



Robin Silver, M.D.
Co-Founder and Board Member



August 12, 2021

Mr. John Petrilla
U.S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Electronically submitted to: BPAMNEPA@cbp.dhs.gov

RE: Review of the Draft Supplemental Environmental Assessment for Proposed U.S. Customs and Border Protection Permanent Air and Marine Facility, at Libby Army Airfield, Fort Huachuca, Arizona

Dear Mr. Petrilla:

The Arizona Game and Fish Department (Department) appreciates the opportunity to review the Draft Supplemental Environmental Assessment (SEA) for the Proposed U.S. Customs and Border Protection Permanent Air and Marine Facility at Libby Army Airfield at Fort Huachuca, Arizona. As stated in your July 7, 2021 letter, the Proposed Action would construct a new permanent facility to replace the current temporary facility at the southeastern end of the Libby Army Airfield. The new permanent facility would have the capacity to accommodate eight aircraft and 100 personnel in support of current and future helicopter and Unmanned Aircraft Systems operations.

Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission (Commission), has jurisdictional authority and public trust responsibilities to protect and conserve the state fish and wildlife resources. In addition, the Department manages threatened and endangered species through authorities of Section 6 of the Endangered Species Act and the Department's 10(a)1(A) permit. It is the mission of the Department to conserve and protect Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. For your consideration, the Department provides the following comments based on the agency's statutory authorities, public trust responsibilities, and special expertise related to wildlife resources and recreation.

During the Department's review of the document, it was unclear whether any of the temporary buildings slated for demolition were checked for evidence of bat use. In past meetings, Fort Huachuca biologists discussed the long-standing challenge of bat occupation in some of the old buildings on the Fort. These discussions coupled with other documentation of bats in the project vicinity (see attached report) indicate a possibility that all buildings to be demolished could harbor bats. Therefore, the Department recommends that all buildings be checked to determine if

azgfd.gov | 520.628.5376

TUCSON OFFICE: 555 N. GREASEWOOD ROAD, TUCSON AZ 85745

GOVERNOR: DOUGLAS A. DUCEY COMMISSIONERS: CHAIRMAN LELAND S. "BILL" BRAKE, ELGIN | JAMES E. GOUGHNOUR, PAYSON
TODD G. GEILER, PRESCOTT | CLAY HERNANDEZ, TUCSON | KURT R. DAVIS, PHOENIX DIRECTOR: TY E. GRAY DEPUTY DIRECTOR: TOM P. FINLEY

they are structurally suitable to provide day and/or night time roosting habitat for bats and whether there is evidence of bat use, such as guano. Please keep in mind that bats may use structures seasonally and those structures should also be evaluated. If bat use has been determined or suspected, bat surveys should be conducted prior to any demolition. The surveys should be scheduled far in advance of proposed work to allow for schedule modification to avoid disruption of maternity roosts during the breeding season. In addition, the Department recommends the hangars also be checked for evidence of use by raptors or other bird species and similar best management practices apply.

If trenching occurs, trenching and backfilling crews should be close together to minimize the amount of open trenches at any given time. Avoid leaving trenches open overnight. Where trenches cannot be back-filled immediately, escape ramps should be constructed at least every 90 meters. Escape ramps can be short lateral trenches or wooden planks sloping to the surface. The slope should be less than 45 degrees (1:1). Trenches that have been left open overnight should be inspected and animals removed prior to backfilling.

The Department recommends that Section 5.8 of the SEA include mitigation for any bats occupying existing buildings to ensure safe exclusion measures are employed once bats vacate the structures. It is also recommended that this section include mitigation for any box turtles encountered during construction and/or demolition activities. Please refer to the Department's letter of January 13, 2020 for additional guidance.

Thank you for the opportunity to provide input on the Draft SEA for the proposed CBP facility at Libby Army Airfield. For further coordination, please contact Kristin Terpening at kterpening@azgfd.gov or 520-388-4447.

Sincerely,



for

Raul Vega
Tucson Regional Supervisor

Attachment: Environmental Review Tool Report

AGFD # M21-07203346

1300 Pennsylvania Avenue NW
Washington, DC 20229



**U.S. Customs and
Border Protection**

July 7, 2021

Stewart Koyiyumtewa, Director, Cultural Preservation Office
Hopi Tribe
P.O. Box 123
Kykotsmovi, AZ 86039



RECEIVED

7/27/21
HCPD

RE: *Draft Supplemental Environmental Assessment for Proposed U.S. Customs and Border Protection Permanent Air and Marine Facility, at Libby Army Airfield, Fort Huachuca, Arizona*

Dear Mr. Koyiyumtewa:

U.S. Customs and Border Protection (CBP) is pleased to provide the enclosed Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) addressing the construction, operation, and maintenance of a new CBP Air and Marine Operations (AMO) joint permanent facility at Libby Army Airfield (LAAF), Fort Huachuca, Arizona. The Draft SEA and FONSI are also available for download from the following URL address: <https://www.cbp.gov/about/environmental-management-sustainability/documents/docs-review>.

The Draft SEA and Draft FONSI were prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code 4321, et seq.), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500–1508), DHS Directive Number 023-01, Rev.01, and DHS Instruction Manual 023-01-001-01, *Implementation of the National Environmental Policy Act*. Recent changes to the CEQ regulations implementing NEPA became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This Draft EA and Draft FONSI substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on December 20, 2019. Therefore, the Draft SEA and Draft FONSI conform to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

The Proposed Action would replace the current temporary CBP facility located at the southeastern end of LAAF with a new permanent facility. The Proposed Action would also include demolition of temporary facilities after completion of the permanent facilities, subject to the availability of funding. The new permanent facility would provide sufficient land with access to a taxiway to support current and future helicopter and Unmanned Aircraft Systems operations. The new facility would be designed and constructed in accordance with Fort Huachuca and LAAF regulations and guidelines. The facility would have the capacity to accommodate eight aircraft (three - MQ-9 Predator B aircraft, three - AS-350 helicopters, and two - C-206 aircraft) and 100 personnel (47 existing personnel and 53 additional personnel).

Mr. Stewart Koyiyumptewa
Page 2

CBP invites your participation in the public review process for the enclosed Draft SEA and Draft FONSI. The 30-day public comment period begins on July 14, 2021 and comments must be received by August 13, 2021 to be considered for incorporation into the Final SEA and Final FONSI. Comments on the Draft SEA and Draft FONSI can be submitted by:

- E-mail to: BPAMNEPA@cbp.dhs.gov
- Mail to: Mr. John Petrilla
U.S. Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Your prompt attention to this request is greatly appreciated. If you require additional information or have any questions, please contact me by telephone at (949) 278-0353 or by e-mail at john.p.petrilla@cbp.dhs.gov.

Sincerely,

**JOHN P
PETRILLA**

Digitally signed by
JOHN P PETRILLA
Date: 2021.07.07
14:19:50 -07'00'

John Petrilla
Acting Environmental Branch Chief
Border Patrol & Air and Marine PMO
U.S. Customs and Border Protection

Enclosures

Refer to SHFO
Tahana Cochran
* A.C.U.
for
Koyiyumptewa
7-28-21



United States Department of the Interior

Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, Suite C3
Phoenix, Arizona 85051

Telephone: (602) 242-0210 Fax: (602) 242-2513



In reply refer to:

AESO/SE
2022-0033593
02EAAZ00-2014-I-0613
22410-2010-I-0421

April 19, 2022

John Petrilla
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Border Patrol & Air and Marine
Program Management Office

Dear Mr. Petrilla:

Thank you for your correspondence of May 4, 2021, received via electronic mail on the same day. This letter documents our review of the U.S. Customs and Border Protection (CBP) Request for Informal Consultation for Proposed Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona (proposed action), in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*). Your letter concluded that the proposed project may affect, but is not likely to adversely affect the ocelot (*Leopardus pardalis*), jaguar (*Panthera onca*), Chiricahua leopard frog (*Lithobates chiricahuensis*; frog), northern Mexican gartersnake (*Thamnophis eques*; gartersnake), Gila topminnow (*Poeciliopsis occidentalis*; topminnow), desert pupfish (*Cyprinodon macularius*; pupfish), Mexican spotted owl (*Strix occidentalis*; owl), western yellow-billed cuckoo (*Coccyzus americanus*; cuckoo), southwestern willow flycatcher (*Empidonax traillii* ssp. *extimus*; flycatcher), northern aplomado falcon (*Falco femoralis septentrionalis*; falcon), and Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*; *Lilaeopsis*). We concur with your determination(s) and provide our rationale(s) below.

Description of the Proposed Action

U.S. Customs and Border Protection (CBP) proposes to construct and operate a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona (proposed action). The proposed action will provide improvements and repairs to the current temporary facility located at the southeastern end of LAAF and will include design and construction of a new permanent facility to replace the existing temporary facility. The new permanent facility will accommodate 8 aircraft and 100 personnel. The facility will provide

sufficient land with access to a taxiway that will allow the facility to support current helicopter and unmanned aircraft systems (UAS) operations. A more detailed description of the proposed action is found in: (1) your August 2019 Biological Resources Survey Report for the Joint Permanent Air Operations Facility at Libby Army Airfield, Fort Huachuca, Arizona U.S. Border Patrol, Tucson Sector, U.S. Customs and Border Protection Department of Homeland Security Washington, D.C. (the equivalent of a Biological Assessment, or BA); (2) your July 2014 *Biological Resources Survey, Proposed Joint Permanent Air Facility, United States Customs and Border Protection, Office of Air and Marine, Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona* (also an equivalent of BA); (3) and your proposed conservation measure, the February 2010 *Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the Upper San Pedro Watershed* (Water Conservation Report). The only substantive difference between the proposed action described in your July 2014 and August 2019 BAs is that the former was based on the then-presence of 47 personnel at LAAF while the latter proposes to employ 100 personnel.

We have already consulted on an earlier variation of the proposed action. We reviewed the July 2014 BA and subsequently transmitted a letter of concurrence on July 14, 2015 (File Numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421). Your agency subsequently acquired a conservation easement on the Flying H Ranch in Cochise County, Arizona, in 2015 to implement the Water Conservation Plans and offset effects to regional groundwater and flows in the Babocomari and San Pedro rivers from staffing at CBP facilities in the upper San Pedro watershed. After accounting for staffing levels at the time, a credit of 82.12 acre-feet per year (AFY) remained to address future water mitigation needs. We reviewed the Water Conservation Report to determine the water-saving credits for your agency's acquisition of a conservation easement on the Flying H Ranch in Cochise County, Arizona to save 210.60 acre-feet per year (AFY) of groundwater. We subsequently transmitted second letter of concurrence on October 30, 2015, (also under File Numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421).

Determination of Effects

The larger airfield is fenced, maintained in an open state, and lacks habitat for the eleven Federally listed species with the potential to occur in the vicinity. No listed species were detected during biological surveys within the current project area per your 2019 BA. The action area also contains no critical habitat for any of the species for which it has been designated. The proposed action's consequences therefore involve no direct effects to any threatened and endangered species.

The most important consequence of the operation of LAAF is the withdrawal of groundwater from the regional aquifer that also supports the baseflow of the upper San Pedro River, lower Babocomari River, and springs where cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish may occur.

Again, current CBP staffing at LAAF consists of 47 people, with a calculated annual groundwater withdrawal of 16.92 AFY. The currently proposed action will increase staffing up to 100 personnel, thereby raising facility water use to approximately 36 AFY and reducing the remaining credit available to address future water mitigation needs from 82.12 AFY to 63.04 AFY.

The fact that unused water mitigation credits exist means that CBP's proposed completion of the LAAF facility and the staffing of that facility with 100 personnel will continue to minimize its indirect effects to the regional aquifer. The proposed action effects are thus insignificant and discountable and not likely to adversely affect cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish. The proposed action is similarly unlikely to adversely affect San Pedro and Babocomari river critical habitat for the cuckoo or the San Pedro River critical habitat for *Lilaeopsis*.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from [FWS Migratory Bird Program web page](#) and [FWS Permits Application Forms](#). For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007, as well as the Conservation Assessment and Strategy for the Bald Eagle in Arizona ([Southwestern Bald Eagle Management Committee website](#)).

In keeping with our trust responsibilities to American Indian Tribes, by copy of this letter we are notifying Tribes that may be affected by this proposed action and encourage you to invite the Bureau of Indian Affairs to participate in the review of your proposed action. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. In all future correspondence on this project, please refer to consultation numbers (ECOSPHERE, 02EAAZ00-2014-I-0613, and 22410-2010-I-0421).

If you require further assistance or if you have any questions, please contact Jason Douglas at 520-670-6150 (extension 226) or Julie McIntyre at 520-670-6159 (extension 223).

Mr. John Petrilla

4

Sincerely,

Heather Whitlaw
Field Supervisor

cc (electronic):

Assistant Field Supervisor, Fish and Wildlife Service, Phoenix, Tucson or Flagstaff (Attn:
[species leads]) *(as appropriate)*

Manager, Cultural Resources, Ak Chin Indian Community, Maricopa, AZ

Tribal Historic Preservation Officer, Gila River Indian Community, Sacaton, AZ

Director, Cultural Preservation Office, Hopi Tribe, Kykotsmovi, AZ

Chairman, Pascua Yaqui Tribe, Tucson, AZ

Director, Cultural Resources, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ

Manager, Cultural Affairs, Tohono O'odham Nation, Sells, AZ

Director, Cultural Research Program, Yavapai-Prescott Indian Tribe, Prescott, AZ

Branch Chief, Environmental Quality Services, Western Regional Office, Bureau of Indian
Affairs, Phoenix, AZ

Archaeologist, Western Regional Office, Bureau of Indian Affairs, Phoenix

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)

USFWS COORDINATION



United States Department of the Interior

Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, Suite C3
Phoenix, Arizona 85051

Telephone: (602) 242-0210 Fax: (602) 242-2513



In reply refer to:

AESO/SE
2022-0033593
02EAAZ00-2014-I-0613
22410-2010-I-0421

April 19, 2022

John Petrilla
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Border Patrol & Air and Marine
Program Management Office

Dear Mr. Petrilla:

Thank you for your correspondence of May 4, 2021, received via electronic mail on the same day. This letter documents our review of the U.S. Customs and Border Protection (CBP) Request for Informal Consultation for Proposed Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona (proposed action), in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*). Your letter concluded that the proposed project may affect, but is not likely to adversely affect the ocelot (*Leopardus pardalis*), jaguar (*Panthera onca*), Chiricahua leopard frog (*Lithobates chiricahuensis*; frog), northern Mexican gartersnake (*Thamnophis eques*; gartersnake), Gila topminnow (*Poeciliopsis occidentalis*; topminnow), desert pupfish (*Cyprinodon macularius*; pupfish), Mexican spotted owl (*Strix occidentalis*; owl), western yellow-billed cuckoo (*Coccyzus americanus*; cuckoo), southwestern willow flycatcher (*Empidonax traillii* ssp. *extimus*; flycatcher), northern aplomado falcon (*Falco femoralis septentrionalis*; falcon), and Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*; *Lilaeopsis*). We concur with your determination(s) and provide our rationale(s) below.

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sufficient land with access to a taxiway that will allow the facility to support current helicopter and unmanned aircraft systems (UAS) operations. A more detailed description of the proposed action is found in: (1) your August 2019 Biological Resources Survey Report for the Joint Permanent Air Operations Facility at Libby Army Airfield, Fort Huachuca, Arizona U.S. Border Patrol, Tucson Sector, U.S. Customs and Border Protection Department of Homeland Security Washington, D.C. (the equivalent of a Biological Assessment, or BA); (2) your July 2014 *Biological Resources Survey, Proposed Joint Permanent Air Facility, United States Customs and Border Protection, Office of Air and Marine, Libby Army Airfield, Fort Huachuca, Sierra Vista, Cochise County, Arizona* (also an equivalent of BA); (3) and your proposed conservation measure, the February 2010 *Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the Upper San Pedro Watershed* (Water Conservation Report). The only substantive difference between the proposed action described in your July 2014 and August 2019 BAs is that the former was based on the then-presence of 47 personnel at LAAF while the latter proposes to employ 100 personnel.

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The most important consequence of the operation of LAAF is the withdrawal of groundwater from the regional aquifer that also supports the baseflow of the upper San Pedro River, lower Babocomari River, and springs where cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish may occur.

Again, current CBP staffing at LAAF consists of 47 people, with a calculated annual groundwater withdrawal of 16.92 AFY. The currently proposed action will increase staffing up to 100 personnel, thereby raising facility water use to approximately 36 AFY and reducing the remaining credit available to address future water mitigation needs from 82.12 AFY to 63.04 AFY.

The fact that unused water mitigation credits exist means that CBP's proposed completion of the LAAF facility and the staffing of that facility with 100 personnel will continue to minimize its indirect effects to the regional aquifer. The proposed action effects are thus insignificant and discountable and not likely to adversely affect cuckoos, flycatchers, gartersnakes, *Lilaeopsis*, topminnow, and pupfish. The proposed action is similarly unlikely to adversely affect San Pedro and Babocomari river critical habitat for the cuckoo or the San Pedro River critical habitat for *Lilaeopsis*.

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For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from [FWS Migratory Bird Program web page](#) and [FWS Permits Application Forms](#). For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007, as well as the Conservation Assessment and Strategy for the Bald Eagle in Arizona ([Southwestern Bald Eagle Management Committee website](#)).

In keeping with our trust responsibilities to American Indian Tribes, by copy of this letter we are notifying Tribes that may be affected by this proposed action and encourage you to invite the Bureau of Indian Affairs to participate in the review of your proposed action. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. In all future correspondence on this project, please refer to consultation numbers (ECOSPHERE, 02EAAZ00-2014-I-0613, and 22410-2010-I-0421).

If you require further assistance or if you have any questions, please contact Jason Douglas at 520-670-6150 (extension 226) or Julie McIntyre at 520-670-6159 (extension 223).

Mr. John Petrilla

4

Sincerely,

Julie McIntyre
for

Heather Whitlaw
Field Supervisor

Digitally signed by Julie
McIntyre for
Date: 2022.04.19 14:57:26
-07'00'

cc (electronic):

Assistant Field Supervisor, Fish and Wildlife Service, Phoenix, Tucson or Flagstaff (Attn:
[species leads]) *(as appropriate)*

Manager, Cultural Resources, Ak Chin Indian Community, Maricopa, AZ

Tribal Historic Preservation Officer, Gila River Indian Community, Sacaton, AZ

Director, Cultural Preservation Office, Hopi Tribe, Kykotsmovi, AZ

Chairman, Pascua Yaqui Tribe, Tucson, AZ

Director, Cultural Resources, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ

Manager, Cultural Affairs, Tohono O'odham Nation, Sells, AZ

Director, Cultural Research Program, Yavapai-Prescott Indian Tribe, Prescott, AZ

Branch Chief, Environmental Quality Services, Western Regional Office, Bureau of Indian
Affairs, Phoenix, AZ

Archaeologist, Western Regional Office, Bureau of Indian Affairs, Phoenix

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)

1300 Pennsylvania Avenue NW
Washington, DC 20229



**U.S. Customs and
Border Protection**

May 4, 2021

Jeff Humphrey
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915

Sent via email to: incomingazcorr@fws.gov; Jeff_Humphrey@fws.gov

Subject: U.S. Customs and Border Protection Request for Informal Consultation for Proposed Permanent Air and Marine Facility at Libby Army Airfield, Fort Huachuca, Arizona

Dear Mr. Humphrey,

U.S. Customs and Border Protection (CBP) plans to construct and operate a Joint Permanent Air Facility at Libby Army Airfield (LAAF), Fort Huachuca, in Sierra Vista, Cochise County, Arizona. The Action would provide improvements and repairs to the current temporary facility located at the southeastern end of LAAF and would include design and construction of a new permanent facility that would eventually replace the existing temporary facility (Figure 1). The new permanent facility would have the capacity to accommodate 8 aircraft and 100 personnel. The facility would provide sufficient land with access to a taxiway that would allow for development of a facility to support current helicopter and UAS (unmanned aircraft systems) operations.

Currently, CBP is preparing a Supplemental Environmental Assessment (SEA) for this Action. Previous coordination with regards to this facility was conducted with your office in 2014 and 2015 (File numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421). As part of that coordination, CBP sought Section 7 consultation and concurrence on listed species determinations as well as concurrence regarding water-saving credits from the acquisition of a conservation easement on the Flying H Ranch in Cochise County, Arizona.

Eleven Federally listed species have the potential to occur or be affected by activities within the proposed project area: ocelot (*Leopardus pardalis*), Mexican spotted owl (*Strix occidentalis*), desert pupfish (*Cyprinodon macularis*), jaguar (*Panthera onca*), southwestern willow flycatcher (*Empidonax traillii* ssp. *extimus*), western yellow-billed cuckoo (*Coccyzus americanus*), northern aplomado falcon (*Falco femoralis septentrionalis*), northern Mexican gartersnake (*Thamnophis eques*), Chiricahua leopard frog (*Rana chiricahuensis*), Gila topminnow (*Poeciliopsis occidentalis*), and Huachuca water umbel (*Lilacopsis schaffneriana* ssp. *recurva*). No designated critical habitat overlaps the project area. None of the eleven Federally listed species were detected during biological surveys within the current project area (Enclosure A).

Mr. Jeff Humphrey
Page 2

The habitat occurring in the project area could be used by northern aplomado falcons. However, considering the lack of sightings and nesting of this species in Arizona, it is unlikely that the proposed project will negatively impact northern aplomado falcons. There is no suitable habitat within or adjacent to the project area for any of the other 10 species identified above (Enclosure A). Therefore, the land disturbance associated with the Action is not likely to result in effects to threatened and endangered species. Furthermore, CBP already offsets water use for the current and proposed staffing levels at the LAAF facility through the Flying H Ranch conservation easement such that indirect effects to riparian and aquatic species from the Action have already been mitigated.

In 2015, CBP acquired a conservation easement on the Flying H Ranch in Cochise County, Arizona as a water conservation measure to offset effects to regional groundwater and flows in the Babocomari and San Pedro rivers from staffing at CBP facilities in the upper San Pedro watershed. After accounting for staffing levels at the time, a credit of 82.12 acre-feet (AF) per year (YR) remained to address future water mitigation needs (Enclosure B). Current CBP staffing at LAAF consists of 47 people, with a calculated annual groundwater withdrawal of 16.92 AF/YR. The Action would increase staffing up to 100 personnel, thereby raising facility water use to approximately 36 AF/YR, and reducing the remaining credit available to address future water mitigation needs to 63.04 AF/YR.

CBP has determined that the Action may affect, but is not likely to adversely affect, ocelot, Mexican spotted owl, desert pupfish, jaguar, southwestern willow flycatcher, western yellow-billed cuckoo, northern aplomado falcon, northern Mexican gartersnake, Chiricahua leopard frog, Gila topminnow, and Huachuca water umbel, and that the Action will not adversely modify any designated critical habitat. CBP respectfully requests concurrence with these determinations.

If you require additional information or have any questions or concerns, please feel free to contact me by telephone at (949) 278-0353 or by email at john.p.petrilla@cbp.dhs.gov.

Sincerely,

**JOHN P
PETRILLA**

Digitally signed by
JOHN P PETRILLA
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16:49:28 -07'00'

John Petrilla
Acting Environmental Branch Chief
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Border Patrol & Air and Marine
Program Management Office

cc (via email):

Julie McIntyre, U.S. Fish and Wildlife Service, Arizona Ecological Services
Jason Douglas, U.S. Fish and Wildlife Service, Arizona Ecological Services

Mr. Jeff Humphrey
Page 3

Enclosures

- A. *Biological Resources Survey Report for the Joint Permanent Air Operations Facility at Libby Army Airfield, Fort Huachuca, Arizona*
- B. Service Correspondence dated October 30, 2015 for File numbers 02EAAZ00-2014-I-0613 and 22410-2010-I-0421

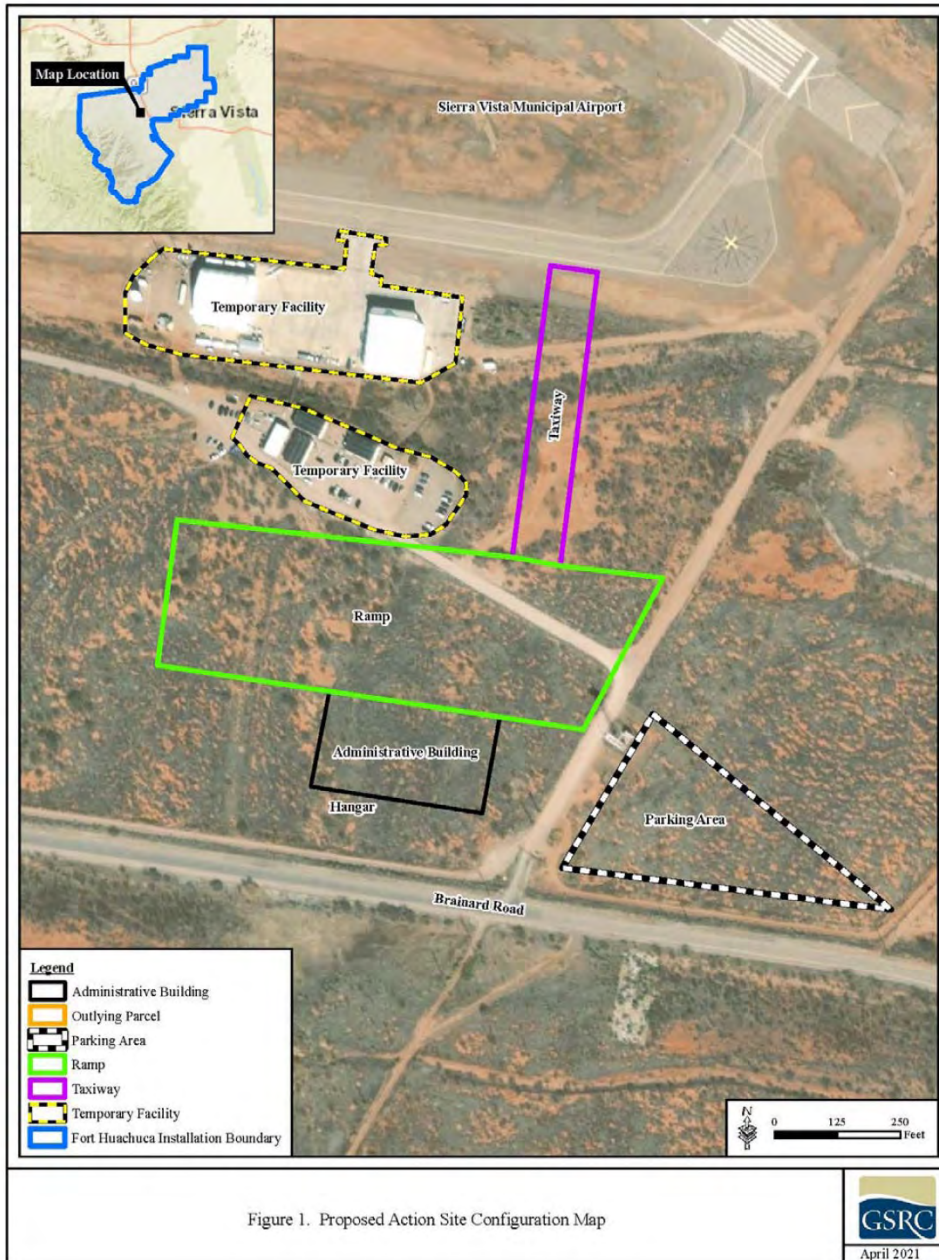


Figure 1. Proposed Action Site Configuration Map

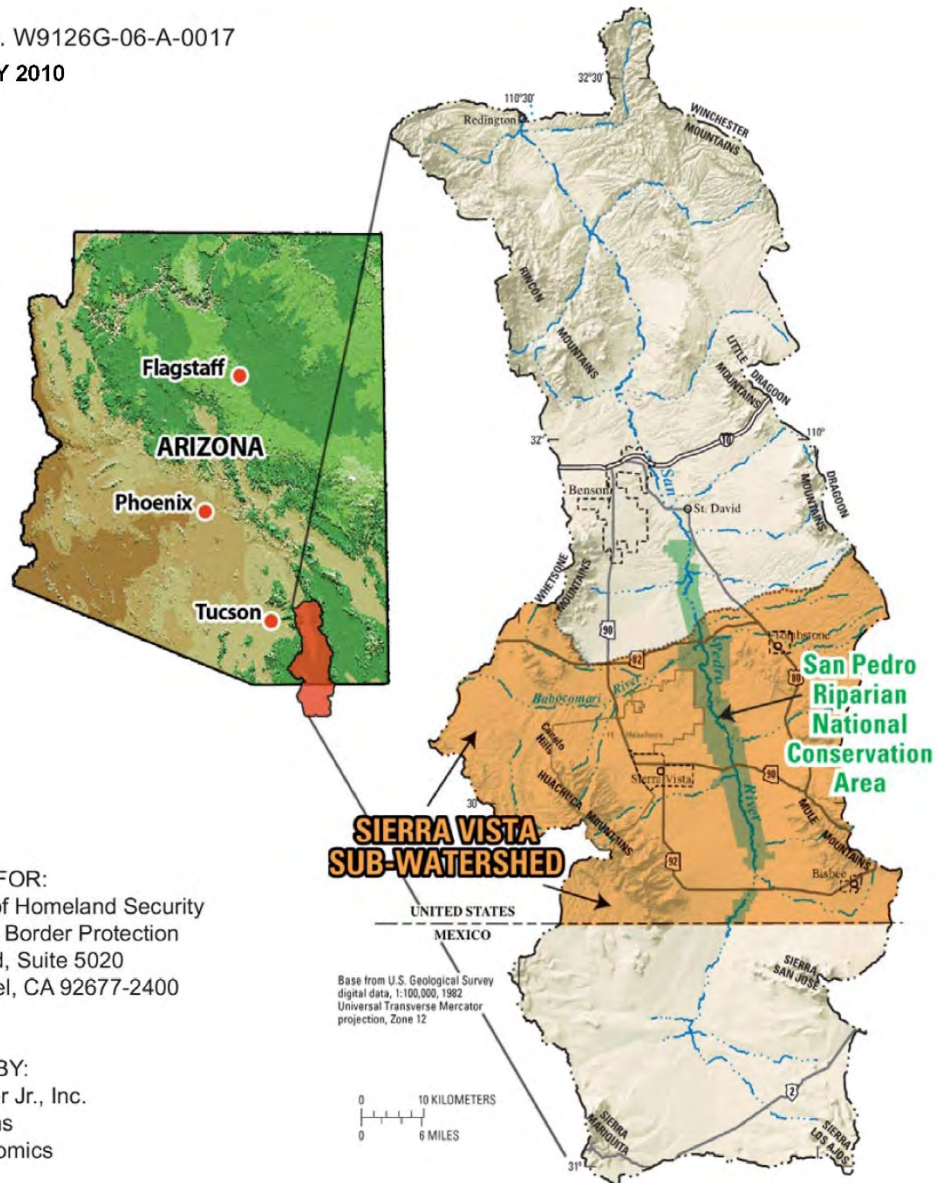
APPENDIX B
U.S. CUSTOMS AND BORDER PROTECTION'S
WATER CONSERVATION MANAGEMENT PLAN

WATER CONSERVATION MANAGEMENT REPORT

FOR U.S. CUSTOMS AND BORDER PROTECTION ACTIVITIES WITHIN THE

Sierra Vista Subwatershed of the San Pedro Watershed

Contract No. W9126G-06-A-0017
 FEBRUARY 2010



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GLOSSARY

A&M	See CBP A&M.
ADEQ	Arizona Department of Environmental Quality.
ADOT	Arizona Department of Transportation.
ADWR	Arizona Department of Water Resources. The state agency that “works to secure long-term dependable water supplies for Arizona’s communities.”
AF	An acre-foot is the volume of water it would take to cover an acre with water one foot deep. An acre-foot is equivalent to 325,851 gallons.
AF/YR	Acre-foot per year. The volume of water measured over the course of a single year. The most commonly used water supply measure in the arid southwest.
AMA	Active Management Area. These are regions of increased groundwater regulation by ADWR.
AMO	See CBP A&M.
AOR	Area of Responsibility.
AZDOC	Arizona Department of Commerce.
BA	Biological Assessment. As a part of the ESA’s Section 7 consultation process, this document is required of a Federal agency proposing a major construction project that may affect a Federally listed threatened or endangered species. It concludes with a determination of effect to the species by the proposed project.
BLM	U.S. Bureau of Land Management.
BO	Biological Opinion. As part of the ESA’s Section 7 consultation process, this document is produced by the USFWS, is based on information provided in a BA on a particular Federally listed threatened or endangered species, states whether or not the proposed action is likely to jeopardize the continued existence of the species or adversely modify designated critical habitat, and provides reasonable and prudent alternatives that could allow the project to move forward if it determines jeopardy or adverse effect to critical habitat would occur from the project as proposed.
BPS	Border Patrol Station.
BRAC	Base Realignment and Closure.
Capital Cost	A measurement of the lump sum costs necessary to implement an alternative.
CBP	U.S. Customs and Border Protection. Part of the U.S. Department of Homeland Security, this agency has the mission of controlling and protecting the Nation’s borders at and between the POEs.

CBP A&M	U.S. Customs and Border Protection Air and Marine. This component of the CBP uses integrated air and marine forces to detect, interdict, and prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband toward or across the borders of the U.S.
CERL	Construction Engineering Research Laboratory, U.S. Army. This research group developed the EIFS model.
CFR	Code of Federal Regulations.
Direct Water Use	The actual water used by CBP at a CBP facility within the Subwatershed.
DOI	Department of Interior.
EA	Environmental Assessment.
Economic Impact Analysis	An analytical structure used to assess the total economic impact of a given action. In this type of analysis, both direct and secondary (employee domestic and induced) economic impacts are assessed.
EIFS	Economic Impact Forecast System. A model developed for USACE in the mid-1970s to assess economic impacts of proposed projects.
EIFS II	Updated and recalibrated version of EIFS.
Employee Domestic Water Use	The water used by CBP personnel and their families, excluding that used by CBP employees while at work at a CBP facility.
EOP	Environmental Operations Park. Part of the City of Sierra Vista's water conservation and mitigation strategy. Primary features include a wastewater treatment plant and groundwater recharge facility
ESA	Endangered Species Act (P.L. 93-205, 16 U.S.C. §§ 1531-1544, 87 Stat. 884, December 28, 1973, as amended).
FMCSA	Federal Motor Carrier Safety Administration
Fort Huachuca	US Army Garrison, located near Sierra Vista, Arizona.
GPCD	Gallons per capita per day. A measurement of daily water use per person in a delineated region (i.e., service area, town, subwatershed, etc.).
GPED	Gallons per employee per day. The average quantity of water (in gallons) used per employee in the workplace.
Greenbush Draw	A tributary to the San Pedro River into which the City of Bisbee currently discharges treated wastewater.
Groundwater Basin	Defined by the Arizona Revised Statutes, Title 45, as "an area which... may be designated so as to enclose a relatively hydrologically distinct body or related bodies of groundwater, which shall be described horizontally by surface description" (see A.R.S. § 45-402).
GSA	U.S. General Services Administration.

Induced Water Use	The water used by domestic, commercial, and municipal activities generated by the presence of CBP's operations in the Subwatershed, excluding direct water use and employee domestic water use.
LAAF	Libby Army Airfield, located on Fort Huachuca.
LEED	Leadership in Energy and Environmental Design
mgd	Million gallons per day
NEPA	National Environmental Policy Act (P.L. 91-190, 42 U.S.C. §§ 4321-4347, January 1, 1970, as amended).
Non-Potable Water	Water of a quality that is not suitable for human consumption and does not meet the requirements of the Safe Drinking Water Act; in some cases non-potable water is suitable for non-agricultural irrigation and/or recharge activities.
NSD	Naco Sanitary District
OFO	Office of Field Operations. This component of the CBP serves to prevent entry of people and goods that are prohibited or threaten our citizens, infrastructure, resources, and food supply, while efficiently facilitating legitimate trade and travel at the POEs.
Overdraft	The overdraft of groundwater occurs when more groundwater is pumped from the aquifer than is naturally or artificially recharged into the aquifer.
PPHU	Persons per housing unit. A demographic measure of the number of persons living in a single place of residence.
POE	Port of Entry. Is any designated place at which a CBP officer is authorized to accept entries of merchandise to collect duties, and to enforce the various provisions of the customs and navigation laws (19 CFR 101.1).
Potable Water	Water of a quality that is suitable for human consumption and meets the requirements of the Safe Drinking Water Act.
Project Team	Comprised of U.S. agency representatives and their hired consultants, the group of researchers and authors involved in the creation of this Water Conservation Management Report.
Recharge	The movement of water from surface water to groundwater, either naturally from rain, snowmelt, and surface waters or artificially from constructed recharge projects and incidental human activity.
SPR	San Pedro River.
SPRNCA	San Pedro Riparian National Conservation Area.
Subwatershed	A portion of a watershed. ADWR has divided the San Pedro Watershed into five subwatersheds. The Sierra Vista Subwatershed is defined as all portions of the San Pedro Watershed in Arizona upstream of the former location of the Fairbanks stream gage.

TDY	Temporary Duty.
TVGC	Turquoise Valley Golf Course. Treated wastewater from the City of Bisbee is currently being reused by this facility.
UAS	Unmanned Aircraft System. Part of CBP A&M planned operations.
U.S.	United States of America
USACE	U.S. Army Corps of Engineers.
USBP	U.S. Border Patrol. This component of the CBP has the mission of preventing the entry of terrorists and their weapons of terrorism and enforcing the laws that protect America's homeland by the detection, interdiction, and apprehension of those who attempt to illegally enter or smuggle any person or contraband across our Nation's sovereign borders.
USFWS	U.S. Fish and Wildlife Service.
USPP	Upper San Pedro Partnership
Watershed	The area defined by a drainage divide where all precipitation that falls on the area will flow to a specified point on a stream. This report focuses on activities within the San Pedro Watershed, also called the San Pedro Basin, located in southeastern Arizona within the Basin and Range Physiographic Province.

1.0 INTRODUCTION

The United States (U.S.) Customs and Border Protection (CBP) is one of the Department of Homeland Security's largest and most complex agencies. Through the coordinated efforts of its component agencies, CBP works to fulfill its mission of controlling and protecting the Nation's borders at and between ports of entry¹ (POEs). CBP's current and future operations in Cochise County, Arizona require water use which can impact the Sierra Vista Subwatershed ("Subwatershed") of the San Pedro Watershed ("Watershed"). This Water Conservation Management Report assesses these impacts and details mitigation measures that can be incorporated into CBP operations.

CBP operations in the Subwatershed are conducted by three component agencies: the CBP Air and Marine (A&M; also referred to as AMO in some reports), the U.S. Border Patrol (USBP), and the CBP Office of Field Operations (OFO). CBP A&M's mission is to protect the American people and the Nation's critical infrastructure through the coordinated use of integrated air and marine forces to detect, interdict, and prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband toward or across the borders of the U.S. As the primary federal law enforcement agency between the POEs, the USBP's primary mission is to prevent the entry of terrorists and their weapons of terrorism and to enforce the laws that protect America's homeland by the detection, interdiction, and apprehension of those who attempt to illegally enter or smuggle any person or contraband across our Nation's sovereign borders. Finally, OFO serves to prevent entry of people and goods that are prohibited or threaten our citizens, infrastructure, resources, and food supply, while efficiently facilitating legitimate trade and travel at the POEs.

CBP proposes to expand their existing operations within the Subwatershed during the next several years. Specifically, CBP proposes to expand CBP A&M facilities and operations at Fort Huachuca, Libby Army Airfield (LAAF), and Sierra Vista Municipal Airport; the USBP facilities and operations at the Naco Border Patrol Station (BPS); and the OFO at the Naco POE.

The Subwatershed is considered essential habitat for the continued existence and recovery of several Federally listed, threatened and endangered aquatic species. Section 7 of the Endangered Species Act (ESA) (P.L. 93-205, December 28, 1973) states that any project authorized, funded, or conducted by any Federal agency should not "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of

¹ A Port of Entry is any designated place at which a CBP officer is authorized to accept entries of merchandise to collect duties, and to enforce the various provisions of the customs and navigation laws (19 CFR 101.1).

habitat of such species which is determined ... to be critical.” Additionally, the Act Section 2(c) states: (1) “It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purpose of this Act. (2) It is further declared to be the policy of Congress that Federal agencies shall cooperate with State and local authorities to resolve water resource issues in concert with conservation of endangered species.”

CBP is required to evaluate the effects of its proposed activities and planned operational expansions on threatened and endangered species residing within the Sierra Vista Subwatershed. Part of this evaluation includes consideration of management strategies, conservation measures and mitigation that, when implemented, avoids, minimizes and/or offsets adverse effects on Federally-listed species resulting from CBP’s activities. Specifically, this report focuses on CBP’s use of water withdrawn from the Subwatershed. The purpose of this report is to:

1. Quantify the current total water use by CBP components who use water from the Subwatershed;
2. Estimate future Subwatershed water use by CBP components;
3. Identify immediate and long-term water management strategies and conservation measures (i.e., avoidance and minimization) capable of reducing the amount of Subwatershed water used by CBP; and
4. Identify potential opportunities for mitigation (i.e., compensation) that would offset adverse effects resulting from CBP’s use of water from the Subwatershed, if any, to Federally-listed species.

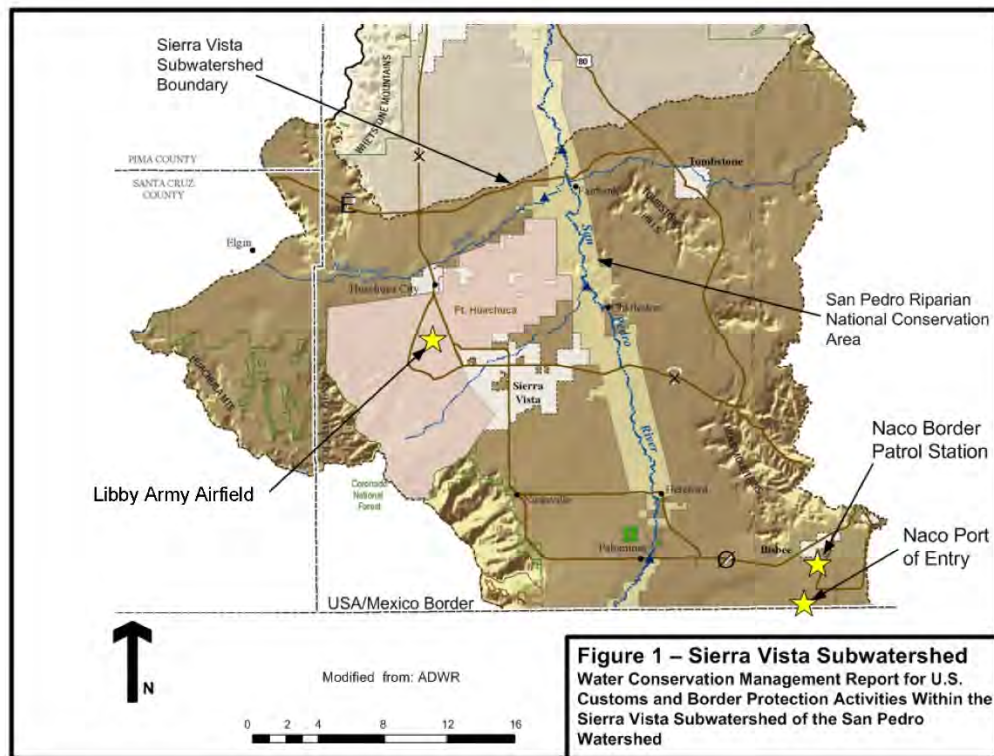
CBP intends to use this report as a supplement to its on-going environmental assessments (EAs) and biological assessments (BAs) for proposed CBP expansion activities in the Subwatershed. U.S. Fish and Wildlife Service (USFWS) concurred with this approach at a meeting with CBP held on November 1, 2007 (see **Appendix A**).

2.0 BACKGROUND

Located in Cochise County in southeastern Arizona, the Subwatershed includes most of the San Pedro Riparian National Conservation Area (SPRNCA) and the cities of Sierra Vista, Naco, Bisbee², Tombstone, Palominas, and Huachuca City. Additionally, Fort Huachuca, a U.S. Army installation, has been located within the Subwatershed since the 1870s. CBP operates three component facilities within the Subwatershed: 1) CBP A&M at LAAF, located on Fort Huachuca; 2) USBP at the USBP Naco Station, located southwest of Bisbee, Arizona; and 3) OFO at the Naco POE, located at the International Border in Naco, Arizona. Sections 4.0, 5.0, and 6.0 of this report, provide additional details relevant to each of these facilities and CBP's operations within the Subwatershed. **Figure 1** contains a detailed map of the Subwatershed and shows approximate locations of LAAF, the USBP Naco Station, and the Naco POE.

The San Pedro River (SPR) is the central feature of the Subwatershed. Unlike most rivers in Arizona, the San Pedro is not dammed and maintains perennial (continual) flows in much of the subject area. The SPR starts in the Republic of Mexico near Cananea and flows north into the United States. The riverbed intersects the groundwater table and as a result groundwater supplies contribute to river flow. Given the relationship between SPR and groundwater supplies, increased groundwater consumption in the basin can reduce the quantity of water flowing in SPR. Groundwater serves as the primary water source for residential, commercial, agricultural, and industrial water users in the Subwatershed. As unmitigated groundwater use in the Subwatershed increases, the quantity of water flowing in SPR is likely to decrease. Lowering of groundwater levels can negatively affect SPR's unique riparian and aquatic ecosystems and imperil the continued existence and recovery of several threatened and endangered species. As a water user within the Subwatershed, CBP and its components must account for, must minimize (i.e., conserve), and ultimately may need to offset (i.e., mitigate) their water usage within the Subwatershed in order to comply with ESA.

² The City of Bisbee is largely located outside of the Sierra Vista Subwatershed; however, the water supply for Bisbee is pumped from wells located within the Subwatershed; therefore this report treats Bisbee as if it were located within the Subwatershed.



As indicated in Section 1.0, this report estimates current and future water use, both direct and induced, of each CBP component operating within the Subwatershed. Current water use calculations are based on 2007 personnel levels. Future water use calculations are based on operational and facility expansions planned to occur over the next several years. The methods used to calculate CBP's and its components' current and future, direct and induced water use follow those employed by the Fort Huachuca Environmental and Natural Resources Division's (2006) *Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca*.

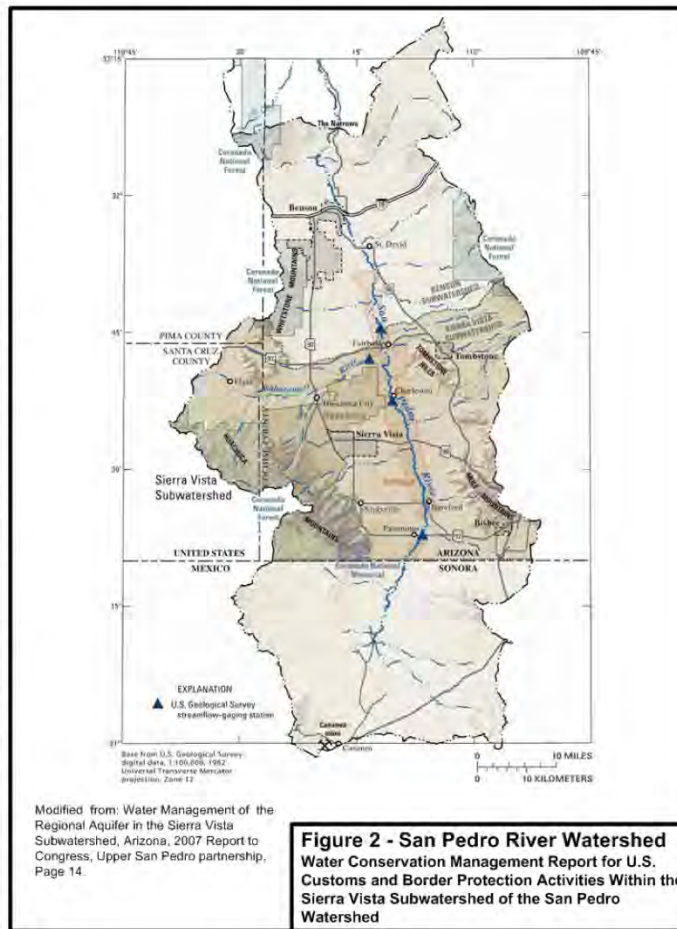
This report also identifies ways in which CBP's water use can be minimized through conservation measures. These measures can be used by existing facilities and/or be incorporated into the design of expanded facilities. Finally, this report identifies mitigation that, when implemented, would offset CBP's groundwater use within the Subwatershed. This report serves as a supplement, dealing solely with water use, conservation, and mitigation, and is intended to support on-going efforts by CBP to

finalize EAs and BAs on expanded facilities and operations at Libby Army Airfield and the USBP Naco Station.

2.1 Physical and Hydrologic Setting

The Watershed (Figure 2) is similar to many areas in southern Arizona located within the Basin and Range Physiographic Province. This province is characterized by broad alluvial valleys bordered by uplifted mountains. Rivers and streams that drain these watersheds commonly are located near valley centers. Prior to the arrival of Anglo settlers in the late 1880s, many of the rivers that drain these alluvial valleys flowed year-round. Since that time, many of the rivers in southern and central Arizona have ceased to flow perennially because of increased water demands from agriculture and human settlement. As a result, riparian vegetation along these watercourses has diminished over time. However, SPR is a notable exception to this trend. Near Sierra Vista, SPR flows perennially. Groundwater supports SPR's base flow in this area and, through continuous discharge, ensures that SPR flows year round.

Precipitation over the Subwatershed varies by elevation and season. In general, higher elevations in the Subwatershed receive the greatest amount of precipitation. The upper elevations of the Huachuca



Mountains receive, on average, 30+ inches of precipitation annually, while the lower elevations along the San Pedro River receive, on average, less than 11 inches annually (ASL Hydrologic and Environmental Services, 1994). Precipitation generally occurs during two principal seasons: (1) December through March and (2) July through September. The average annual rainfall for Naco, Arizona is about 14 inches. At Fort Huachuca, the annual average rainfall for the period from 1900 to 1981 was 15.39 inches.

2.1.1 Sierra Vista Subwatershed Water Budget

A water budget is a method of accounting for all water within a set of defined boundaries. Budgets include factors that are both directly measured and estimated. They are generally expressed as long-term averages. Typical variables in water budgets include groundwater in storage, surface water inflows and outflows, surface water diversions, annual groundwater pumping, natural recharge from rainfall and runoff, and artificial recharge from constructed recharge projects and incidental human activity.

Water budgets provide an indication of an area's water resource conditions. They can be used to assess progress toward achieving management goals, and they allow for assessment of whether more water is used than replaced through natural or artificial recharge. When an area experiences a water deficit, demands are met by overdrafting (see glossary) its water supplies. In 1991, the estimated annual overdraft of the Subwatershed was 11,000 AF (DOI, 2008).

A 2007 report to Congress entitled, *Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona* (Department of Interior (DOI), 2008), contains a current water budget for the Subwatershed. **Table 1** provides a breakdown of the water budget as described in that report. As indicated in **Table 1**, progress has been made toward balancing the water budget within the Subwatershed. Over the 15-year span between 1991 and 2006, the deficit decreased from 11,000 AF to 5,200 AF, a positive gain of 5,800 acre-feet per year (AF/YR). Nevertheless, in order to balance the water budget within the Subwatershed, this annual deficit of 5,200 AF/YR must be eliminated.

2.1.2 Upper San Pedro Partnership

With concerns mounting over the long-term health of SPR, the Upper San Pedro Partnership (USPP) was created in 1998. The USPP has been instrumental in successfully reducing the water budget deficit within the Subwatershed. USPP's purpose is to coordinate and cooperate in the identification, prioritization, and implementation of comprehensive policies and projects to assist in meeting water needs within the Sierra Vista Subwatershed of the Upper San Pedro River Basin. It is

a consortium of 21 local, State, and Federal agencies and private organizations with a common goal of achieving a sustainable water yield (i.e., balanced water budget) in the Subwatershed by 2011. Sustainability goals, at least initially, are to (1) eliminate the current annual storage deficit in the regional aquifer and (2) begin accumulating storage with the intent to replenish some of the historical storage depletion.

2.1.3 Impacts on Sierra Vista Subwatershed from Regional Water Use

According to the U.S. Bureau of Land Management (BLM), "more than 80 species of mammals, 40 species of reptiles and amphibians, 100 species of butterflies, 20 species of bats, and 350 species of birds live or migrate along its riverbanks." According to the USPP (2007), 60 to 75 percent of wildlife species in Arizona depend on riparian habitats to survive.

Because of the complex interaction between groundwater and surface water systems, SPR's continued health is dependent upon careful management of both supply systems. Without water conservation measures, the current water deficit would negatively affect long-term flows of SPR. Reduced river flows would diminish or completely eliminate ecologically diverse riparian areas and aquatic ecosystems. Threatened and endangered species dependent on these ecosystems could suffer adverse effects. Increases in groundwater consumption within the Subwatershed would increase the deficit and exacerbate these types of effects if mitigation to offset groundwater use is not implemented.

2.1.4 Current Conservation and Mitigation Efforts

As referenced in Section 2.1.1 and summarized in **Table 1**, current conservation practices (that minimize water use to the greatest extent practicable) combined with mitigation (to offset water use) have substantially reduced the water deficit from 1991 to 2005. Conservation and mitigation efforts currently utilized in the Subwatershed include the following:

- A large portion of land in the valley center of the Subwatershed has been acquired by the BLM and incorporated into the SPRNCA. SPRNCA is the nation's first national riparian conservation area. Congress created SPRNCA in 1988, directing the Secretary of the Interior to "conserve, protect and enhance the natural resources" of this riparian system.

Table 1. 2006 Water Budget for the Sierra Vista Subwatershed (DOI, 2008)

Component	Estimated Volume (Acre-Feet (AF))	Description
Natural Aspects of System		
Natural Recharge ¹	15,000	Inflow largely from percolating waters on and around mountains and through ephemeral channels
Groundwater Inflow ¹	3,000	Subsurface inflow from Mexico
Groundwater Outflow ¹	-440	Subsurface outflow at U.S. Geological Survey San Pedro River near Tombstone streamflow-gauging station (09471550)
Stream Base Flow ¹	-3,250	Groundwater discharge to the river that flows out of the Subwatershed
Evaporation and Plant Transpiration ¹	-10,800	Groundwater consumed in the riparian system exclusive of evapotranspiration supplied by near-riparian recharge from precipitation or flood runoff
Pumping		
Public Water Supply (gross)	-10,610	Groundwater withdrawals by water companies and municipalities
Rural Wells (gross)	-4,390	Groundwater withdrawals by private wells
Industrial (gross)	-1,490	Groundwater withdrawals for industrial, golf courses, sand and gravel operations
Irrigation (net)	-430	Groundwater withdrawals for agricultural use; consumptive use only
Active Management Measures		
Reduction of Riparian Evapotranspiration	475	Management of invasive mesquite
Municipal Effluent Recharge	3,030	Recharge by the City of Sierra Vista and Fort Huachuca
Detention Basin Recharge	310	Construction of new detention basins designed to aid in groundwater recharge
Passive Recharge Resulting from Human Activities		
Incidental Recharge	2,090	Mainly from exterior irrigation and septic tanks
Urban-Enhanced Recharge	2,300	Urbanization concentrates runoff in ephemeral-stream channels which increases natural recharge
Aquifer Storage Change²	-5,200	

¹ Flow volume estimated by the Arizona Department of Water Resources.
² Value rounded to the nearest 100 AF/YR.

- Fort Huachuca, Cochise County, Huachuca City and the Cities of Sierra Vista, Bisbee, and Tombstone implemented various conservation measures to minimize their water use. These conservation measures include public education on how to conserve water supplies and rebate programs for retrofitting residential plumbing. The Fort also installed approximately 460 waterless urinals.
- Both the Fort and Sierra Vista directly recharge effluent produced from each entity's wastewater treatment plant. Recharging effluent to the regional aquifer offsets groundwater withdrawals from the aquifer.
- Fort Huachuca, Cochise County, and Sierra Vista constructed stormwater detention basins. These basins are specially designed to retard storm runoff and increase its infiltration into the regional aquifer.
- Bisbee uses its effluent to replace groundwater-derived golf course irrigation, thereby reducing the amount of groundwater withdrawn.
- BLM removed invasive trees from along the banks of SPR to reduce water consumption from non-native vegetation.
- The Nature Conservancy and the Fort have worked together to purchase conservation easements on agricultural lands to reduce or eliminate the agricultural demand for groundwater from those lands.

Each of these projects has helped to make progress towards USPP's goal of a balanced water budget for the Subwatershed. The on-going effluent recharge efforts by Fort Huachuca and the City of Sierra Vista are of particular importance in this analysis. All effluent produced by the Fort is directly reused or recharged within the Subwatershed. Wastewater treatment plays a major role in the Army's multi-tiered water resource management program that guides effective management and conservation of Fort Huachuca's water resources. To facilitate effluent recharge, Fort Huachuca completed construction of Phase I of an Effluent Recharge and Reuse Project in 2002. This \$6 million project included upgrading the wastewater treatment plant to improve effluent quality and construction of seven effluent recharge basins and one stormwater recharge basin. Since both water and wastewater service is provided to CBP A&M by the Fort, there is a direct offset to CBP A&M's water use and, consequently, the amount CBP A&M is required to offset through mitigation.

Furthermore, some CBP component employees and the induced population resulting from CBP's activities within the Subwatershed reside in the City of Sierra Vista, which has a sophisticated water conservation and mitigation strategy. A key feature of this strategy is the Environmental Operations Park (EOP), located east of Sierra Vista. The EOP is the location of the city's compost facility, its wastewater treatment facility, 30 acres of recharge basins, 50 acres of constructed wetlands, and a 1,800 square-foot wildlife viewing facility. The City of Sierra Vista estimates that it has offset 40 percent of its groundwater use through its own mitigation activities. This means that 40 percent of the water use attributable to CBP component employees and induced population living in Sierra Vista is offset by the City of Sierra Vista's existing mitigation (Sierra Vista).

2.2 Compliance with Federal, State and Local Laws Relating to Water Use

As indicated in Section 1.0, ESA requires Federal agencies to conserve endangered and threatened species and to cooperate with State and local authorities to resolve water resource issues in concert with conservation of endangered species. As previously discussed, several threatened and endangered species rely on the riparian and aquatic ecosystems created by the year round flow of SPR within the Subwatershed. For example, the southwestern willow flycatcher (*Empidonax traillii extimus*)—an endangered bird species—relies heavily on SPR's riparian areas for foraging and nesting purposes. The Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*)—an endangered plant species—relies on the unique aquatic environment created by the perennial flow of SPR. In order to comply with ESA, CBP and its components must ensure their water use within the Subwatershed does not adversely affect threatened or endangered species. This report documents CBP's current and future total water use within the Subwatershed, discusses various conservation measures that can be utilized to minimize CBP's water use, and provides mitigation measures that if implemented would offset CBP's water use resulting in a balanced CBP water budget.

The Defense Authorization Act of 2004, Public Law 108-136, Section 321, stipulates the way in which Section 7 of the ESA applies to the Fort Huachuca, Arizona military reservation. Section 321 of this Act further directs the Secretary of the Interior to prepare reports to Congress regarding techniques that can be implemented to reduce overdraft and restore the sustainable yield of groundwater in the Sierra Vista Subwatershed. USPP prepares Section 321 reports as a means to update Congress on progress towards achieving sustainability goals and a balanced water budget within the Subwatershed. These reports serve as a valuable tool for understanding the current condition of the Subwatershed and have been utilized in preparation of this study.

State water laws are bifurcated between regulation of surface water use and groundwater use. Arizona surface water law is based on the doctrine of prior appropriation, where "first in time is first in right." Although surface water diversions are subject to regulation by the Arizona Department of Water Resources (ADWR), there are no active regulatory programs for existing surface water users beyond those of record-keeping. New surface water diversions cannot be initiated without filing the proper application with ADWR. Groundwater regulations are intensive in five areas of the State known as Active Management Areas (AMAs). Located around major population centers, the five AMAs each have a specific goal that groundwater regulations are designed to achieve. The Sierra Vista Subwatershed is not located within one of Arizona's five AMAs. Petitions to create a new AMA in the Subwatershed have been filed with ADWR. However, ADWR concluded that the statutorily prescribed precedents did not exist for creation of an AMA, and the petition was rejected. The Subwatershed is still subject to new well permitting and drilling standards. CBP is a water user only and does not own or operate any groundwater wells or surface water diversions. As a result, CBP will have no foreseeable interaction with State water law.

3.0 DATA COLLECTION AND ANALYSIS METHODS

Sections 3.1 and 3.2 discuss data collection efforts and analytical methods used to prepare this report. CBP components operating within the Subwatershed served as the primary data sources for this report. The analytical methods follow those:

- Used by Fort Huachuca's Environmental and Natural Resources Division (2006) in the Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona.
- Accepted by USFWS in its Biological Opinion (BO) (USFWS, 2007).

3.1 Data Collection

Detailed questionnaires were sent to points of contact at each CBP station of operation. **Appendix B** contains the questionnaire used to gather data from each of the components. In some cases, specific data sets were not available (e.g., specific financial data sets needed for the economic analysis). In other cases, the requested data simply did not exist (e.g., water delivery records do not exist for CBP A&M because they use water provided by the Fort from on-site wells that are not metered separately for deliveries to CBP A&M).

In cases when requested data was not provided or did not exist, other sources were used to complete data collection. Other sources included CBP's website (www.cbp.gov), Fort Huachuca's BA and the USFWS's BO, the USPP's website (www.uspppartnership.com), and ADWR's website (www.azwater.gov). When other sources did not meet the data requirements, the Project Team used assumptions derived from its extensive experience with water use projects.

In order to fulfill data requirements, a series of Fact Sheets were created that provide information such as the source of data and basis for assumptions. **Appendix C** contains the Fact Sheets.

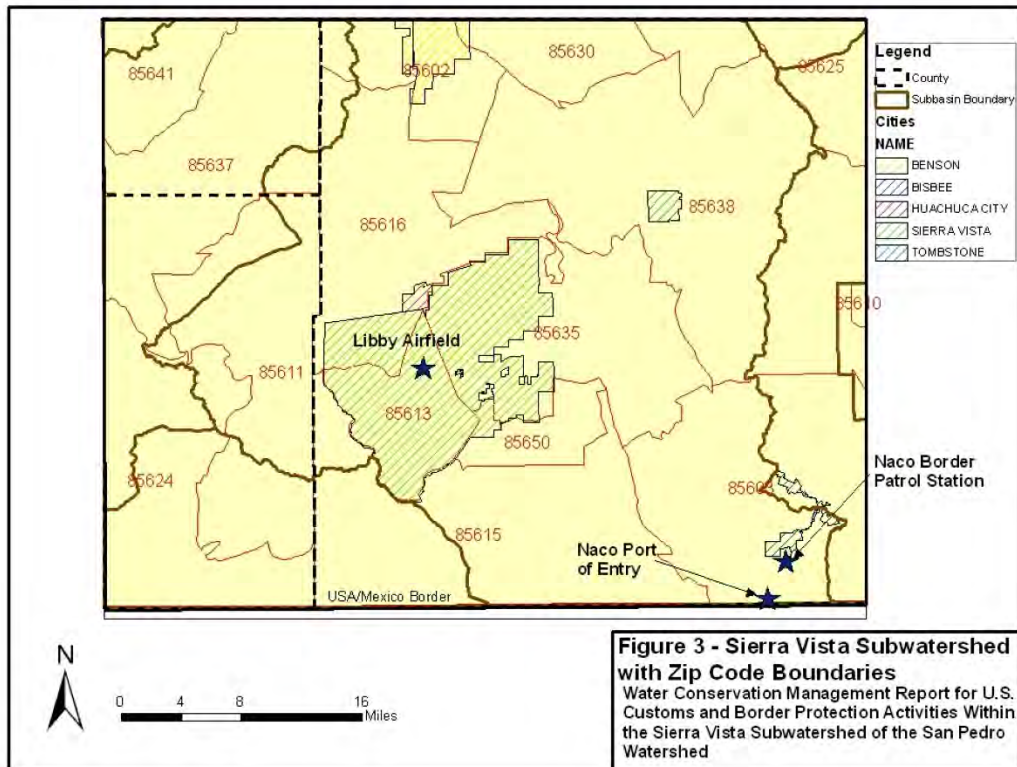
3.2 Analytical Methods

Water use calculations and economic modeling comprise the two primary methods used to derive CBP's current and future total water use within the Subwatershed. This section describes the water use calculations and the rationale for using the selected method, conversion factors, and equations. It also presents some of the base population figures and water use values that will be referenced in

Sections 4, 5, and 6. A detailed description of the economic model used to determine induced population is found in Section 3.2.2.1.

3.2.1 Determining Subwatershed Population

The first step in calculating CBP's current and future total water use within the Subwatershed was to determine how much of the Subwatershed's population was attributable to CBP's activities within the Subwatershed. The number of CBP households located within the Subwatershed and ultimately total water demand was determined by using anonymous zip code data provided by each CBP component. Because of privacy and security concerns, the actual list of zip codes is not included in this report. **Figure 3** represents zip code boundaries within the Subwatershed.



Using zip code data and the Subwatershed map, the number of employees with home locations inside the Subwatershed was determined. **Table 2** shows the number and percentage of employees living in the Subwatershed.

Table 2. Number and Percentage of Employees Living in the Subwatershed

	CBP A&M	USBP Naco Station	OFO
Total Employees	47	417	38
Total Inside Subwatershed (from zip code data)	28	341	31
% Inside Subwatershed	59.57%	81.77%	81.58%

The next step in determining the total water demand involved identifying the average number of people residing in a housing unit or the persons per housing unit (PPHU) rate. U.S. Census demographic data were used to determine this figure. According to the 2000 U.S. Census, the average PPHU for Cochise County was 2.5. In order to determine the total number of CBP employees and their families using water at their homes within the Subwatershed, the number of CBP employees residing in the Subwatershed (from the zip code data) was multiplied by the PPHU for Cochise County (2.5). **Table 3** shows the CBP employee and family population within the Subwatershed.

Table 3. CBP Employee and Family Population within the Subwatershed

CBP A&M	USBP Naco Station	OFO
62.5*	852.5	77.5
*Note. Five of the contractors are assigned to CBP A&M on temporary duty (TDY). Since they are not permanent residents and have not relocated to the Subwatershed with their families, they were counted as single individuals when employee family population was calculated.		

These calculations were repeated for future personnel levels.

3.2.2 Determining Induced Population

Induced population includes those individuals who live and work in the Subwatershed as a result of the expenditures at each CBP facility for employees, other services, materials, and supplies. Economic impacts that result from this induced population begin with employee income and facility expenditures for goods and services, which are considered direct effects in economic parlance. These direct expenditures will then be re-spent within the local area, producing induced and indirect effects. For purposes of this study, indirect (immediate suppliers) and induced (compounding) employment do not need to be, and were not, differentiated. The induced effects of job creation generate a multiplier effect within the economy. An induced population also occurs, which includes

families of induced workers. To complete the water use analysis, indirect and induced populations were estimated in the Subwatershed as a result of the CBP components. **Table 4** shows the results of the economic modeling described in greater detail in the following sections.

Table 4. CBP Induced Population within the Subwatershed

	CBP A&M	USBP Naco Station	OFO
Current	110	595	53
Future	161	668	53*
*No growth/expansion is anticipated.			

3.2.2.1 The Economic Impact Forecast Model

The multiplier effect can be estimated using an economic impact technique or model to estimate the indirect and induced effects. In this case, facility employment and salaries in the Subwatershed, facility expenditures, and construction costs at CBP’s facilities were applied as direct effects to estimate the indirect and induced effect estimates.

After careful consideration, the Project Team selected an impact model originally developed for the U.S. Army Corps of Engineers (USACE) as the most appropriate tool for this effort. The U.S. Army Environmental and Natural Resources Division (2006) utilized the Economic Impact Forecast System (EIFS) for the *Programmatic BA for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona*. Evaluation of the EIFS Model was a logical first step in selecting an economic impact model for this project.

The EIFS Model was developed by the Army Construction Engineering Research Laboratory (CERL) in response to requirements of the National Environmental Policy Act (NEPA) in the mid-1970s. The model includes national economic data for counties, parishes, and cities. These data are compiled from the Economic Census, Census of Agriculture, the Bureau of Economic Analysis, and the County Business Patterns. Although CERL no longer maintains the model, USACE economists currently use the model in Base Realignment and Closure (BRAC) analyses and Border Patrol Crossing construction project analyses. The original model developers have continued to update and recalibrate the model and have made the latest version, EIFS II, available on-line at www.nepaworkbench.com.

The Project Team interviewed Ron Webster, one of the original EIFS developers, who currently maintains the EIFS II Model. Discussions with Mr. Webster, USACE economists, and trial runs with

the on-line EIFS model, led the Project Team to determine that the model would provide reasonable and defensible employment projections.

The Project Team considered other economic models such as IMPLAN, but determined EIFS would be the most appropriate model for the following reasons:

- This EIFS Model is specific to federal projects rather than to private sector employment analyses.
- EIFS has been accepted and continually used within the military community.
- EIFS has been reviewed by stakeholders and the Government Accounting Office. The resulting analyses have been upheld.

To forecast employment the Project Team decided to use the EIFS II version with the updated database. Nevertheless, the resulting population forecasts were inconsistent, and developers agreed that this is a weakness within the model. As a result, the Project Team developed a method to derive population from the EIFS II employment forecasts. This method is described in Section 3.2.2.2.

The EIFS Model uses the economic base model approach, which compares the ratio of total economic activity within a region to basic economic activity. Generally, basic economic activities are those which bring monies into an area from external sources. In the case of EIFS, basic economic activity is that caused by federal activities, such as those specific to this study. The ratio of basic income to total income provides the multiplier used to develop the forecast output in the EIFS Model. Data used in the model reflect 2006 values and are specific to Cochise County.

3.2.2.2 EIFS Model Inputs

Section 3.1 describes the data sources for the model inputs and the direct effects of employment, income, and other facilities expenditures in the Subwatershed. In isolated cases, data were lacking and the Project Team performed additional research to obtain reasonable estimates based on past experience and expertise. Sources used included the Department of Homeland Security Fiscal Year 2009 Budget and a recently awarded contract for a Border Patrol Station facility.

The first step in utilizing the EIFS II Model is to select the region of impact, which in this case was Cochise County. Data were input for each CBP facility, and the model was run in six sessions accounting for current and projected direct effects in the Subwatershed. For each of the six model runs, the following data were input:

- 1) Change in local expenditures – The local operating budget for each facility.
- 2) Change in civilian employment – For current inputs, the number of existing assigned staff was used. For future inputs, projected assigned staff figures were used.
- 3) Average income of affected civilian – Actual or estimated income per assigned staff member.
- 4) Percent expected to relocate – 100 percent.

In each case, the percent expected to relocate was input as 100 percent (as a conservative estimate). Nevertheless, it is likely that at least some of the new employees will already be residents of the area. Also, many of the positions require specialized skills that are unlikely to be available in a relatively small population set. Finally, CBP’s previous recruitment efforts in the area may have already attracted those in the population who are interested in these positions. The same method was used to establish current and future employment impacts.

The Forecast Output for each model run produced direct, induced, and total employment figures. In each case, the direct employment figure in the Forecast Output was greater than the Change in Civilian Employment input because it included indirect employment, which is not a separate output line in the EIFS II Model. As described above, neither indirect nor induced employment is differentiated in deriving population estimates. Therefore, the total employment number produced by the model, less the Change in Civilian Employment input, provided the indirect and induced employment resulting from CBP activities at each facility.

The resulting population projections induced by the economic impact of CBP activities are discussed in detail within the appropriate section of this report for each entity (Section 4 for CBP A&M activities, Section 5 for USBP activities, and Section 6 for OFO activities). The outputs from the EIFS II Model are presented in **Appendix D**.

3.2.3 Determining Total CBP Subwatershed Population

Once the induced population was determined, it was added to the CBP employee and family populations living within the Subwatershed (identified in **Table 3**) to determine the total CBP Subwatershed population. **Table 5** summarizes these total values.

Table 5. Total CBP Subwatershed Population

CBP A&M	USBP Naco Station	OFO
172.5	1,447.5	130.5

3.2.4 Determining Direct Water Use

Direct water use includes actual water used by CBP at a CBP facility within the Subwatershed. Direct, current, and future water use was determined in a number of different ways as described in Sections 4, 5, and 6 respectively. In some cases, direct reporting of actual water use was available via water delivery records obtained from the facility's water provider. Water delivery records quantify all of the water used (i.e. drinking, irrigation, washing, etc.) by CBP at a facility

The annual quantity of water used by each CBP employee at a facility was calculated by dividing the annual gallons of water used (obtained from water records) by the number of CBP employees at the station (as served through a water provider). Dividing the quantity of CBP employee water use annually (in gallons) at a station by 365 (i.e., number of days in a typical year) yields the quantity of water used by a CBP employee at the facility during a single day. This result represents the daily per employee water use rate referred to herein as Gallons per Employee per Day (GPED). The equation below summarizes the GPED calculation.

$$GPED = \text{Annual Water Use} \div \text{employees served} \div 365 \text{ days}$$

An AF is a commonly used unit of measure for water and represents the volume of water required to fill a one acre area to a depth of one foot. In order to convert gallons per day per employee to AF per day per employee, the number of gallons is divided by 325,851 as illustrated below.

$$\text{Acre-feet} = \text{number of gallons} \div 325,851$$

When monthly water use records were not available, water use was estimated based on a detailed description of the facility and its water-using activities. In addition to determining total direct water use (i.e., water actually used by CBP employees while at work), subsequent steps in this analysis also accounted for activities that offset at least some portion of the direct water use at a given facility. For each CBP facility, these activities were accounted for and the extent to which they offset direct water use was quantified.

3.2.5 Determining CBP Employee, Family, and Induced Water Use

In order to calculate the quantity of water used by CBP employees, their families, and the induced population, the population was divided between those located in incorporated areas and those located in unincorporated areas. This determination was made based upon U.S. Census demographic data, which indicates that within Cochise County 69% of the population is located in

incorporated areas and 31% of the population is located in unincorporated areas. **Table 6** summarizes the CBP employee, family, and induced population split between incorporated and unincorporated areas.

Table 6. CBP Subwatershed Population Split Between Incorporated and Unincorporated Areas

	CBP A&M	USBP Naco Station	OFO
Incorporated Areas (69%)	119.03	998.78	90.05
Unincorporated Areas (31%)	53.48	448.73	40.46
Total CBP Subwatershed Population	172.5	1,447.5	130.5

Two water use rates were required to complete the water use calculations: one rate to calculate water used by those living in incorporated areas and another rate for those living in unincorporated areas. For both areas, calculations included water use data used by Fort Huachuca in its 2006 BA and by the USFWS in its 2007 BO. 160 gallons per capita per day (GPCD) was used to represent water use by populations in incorporated areas. The Fort determined this figure by calculating 2005 water use by the Fort and the City of Sierra Vista divided by the 2005 population of these areas. The following calculation was used to determine water use of the CBP employees, families, and induced populations within incorporated areas:

$$\text{Incorporated CBP Population Water Use (AF/YR)} = \text{Number of CBP Employees, Families and Induced Population in Incorporated Areas} * 160 \text{ GPCD} * 365 \text{ Days} \div 325,851 \text{ gallons}$$

According to the Fort's BA and the USFWS's BO, the Groundwater Users Advisory Council of the Prescott Active Management Area (2006) identified a water use rate of 118 GPCD for domestic wells, which are the most likely source of supply in unincorporated areas. Incorporating this GPCD rate, the following calculation was used to determine the water use of the CBP employee, family, and induced population within unincorporated areas:

$$\text{Unincorporated CBP Population Water Use (AF/YR)} = \text{Number of CBP Employee, Families and Induced Population in Unincorporated Areas} * 118 \text{ GPCD} * 365 \text{ Days} \div 325,851 \text{ gallons}$$

Incorporated and unincorporated area water use by CBP employees, families, and induced populations were added to obtain total water use by these employees. These calculations were repeated for future personnel levels.

3.2.6 Industrial Pumping within Subwatershed

Fort Huachuca's BA and the USFWS's BO included a portion of industrial pumping within the Subwatershed in the Fort's total water usage. This figure was derived by first calculating the portion of total Subwatershed population attributable to the Fort. Using the Fort's 2006 Subwatershed estimate of total population (76,503) and the current total population for each CBP component, the percentage of Subwatershed population attributable to each CBP component was calculated. This calculation was repeated based on anticipated future personnel levels and a future Subwatershed population of 110,711 in 2025 (Arizona Department of Commerce³ (AZDOC), 2006). **Table 7** lists the calculated percentage of Subwatershed population attributable to each CBP component.

Table 7. Subwatershed Population Attributable to Each CBP Component

	CBP A&M	USBP Naco Station	OFO
Current Total CBP Subwatershed Population	172.5	1,447.5	130.5
Current Percentage of Total Subwatershed Population	0.225%	1.892%	0.171%
Future Total CBP Subwatershed Population ⁴	245.2	1,588.0	130.5
Future Percentage of Total Subwatershed Population	0.221%	1.434%	0.118%

The percentage of Subwatershed population was then multiplied by the amount of industrial pumping in the Subwatershed in 2006 (1,250 AF) using the following equation:

$$\text{Portion of Industrial Pumping Attributable to Each CBP Component} = \text{Total Subwatershed Industrial Pumping in 2006} * \% \text{ of Subwatershed Population Attributable to Each CBP Component}$$

These calculations were repeated for future personnel levels.

3.2.7 Existing or Planned Mitigation

Once total water use was determined, the effect of current or planned future efforts that serve to offset water use within the Subwatershed was considered. Each effort was accounted for based on specific factors. Some of these efforts only apply to a single CBP component, such as:

³ Use of these population values is consistent with the Fort's BA. Formerly the Arizona Department of Economic Security maintained population figures. At present, the Arizona Department of Commerce maintains this information.

⁴ Population is derived from the sum of each CBP Components' employees, their families, and the induced population as identified in Sections 4, 5, and 6 respectively.

- Direct recharge or wastewater by Fort Huachuca, which applies only to A&M water use.
- Effluent from the USBP Naco Station reused for golf course irrigation.
- Planned rainwater harvesting and retention basins at USBP Naco Station expansion.

Two existing mitigation efforts apply to all three components. They are effluent recharge by the City of Sierra Vista and passive recharge from septic tanks within the Subwatershed.

3.2.7.1 Sierra Vista Effluent Recharge

Ongoing effluent recharge by the City of Sierra Vista is the primary means currently used to offset water use within the Subwatershed. Since Sierra Vista is a primary population center in the Subwatershed, many CBP employees, and much of the induced population, live in Sierra Vista where wastewater is treated and recharged. The addition of recharged effluent back into the aquifer is a direct offset to groundwater use by CBP employees, their families, and the induced population.

The CBP population in Sierra Vista (based on zip code data) was used in conjunction with the City's reported rates of effluent recharge to determine how much of the total water use was offset. These values were calculated using the percentage of Sierra Vista's total population represented by the CBP population. In 2005, Sierra Vista's population was 34,694 (AZDOC, 2006). According to the Fort's BA and the USFWS's BO, an estimated 5% of Sierra Vista's population is not connected to the sewer system and instead has individual septic tanks. Thus, the population attributable to CBP living in Sierra Vista and the population of the City of Sierra Vista was reduced by 5% for the following calculations. These calculations were repeated based on future personnel levels and a future Sierra Vista population of 59,972 (AZDOC, 2006). **Table 8** shows the estimate of the number of persons attributable to CBP living in the City of Sierra Vista.

Table 8. Number of Persons Attributable to CBP Living in the City of Sierra Vista

	CBP A&M	USBP Naco Station	OFO
Current Total CBP Subwatershed Population (from zip code data)	172.5	1,447.5	130.5
Current Total Inside Sierra Vista (from zip code data)	146.79	1,120.65	58.94
Current Total Inside Sierra Vista as a Percentage of Sierra Vista's Total Population	0.423%	3.230%	0.170%
Current Total Inside Sierra Vista Served by Sewer (95% of current total inside Sierra Vista)	139.45	1,064.61	55.99
Future Total CBP Subwatershed Population	245.2	1,588	130.5
Future Total Inside Sierra Vista (Based on projections using zip code data)	207.55	1,229.42	58.94
Future Total Inside Sierra Vista as a Percentage of Sierra Vista's Population	0.346%	2.050%	0.098%
Future Total Inside Sierra Vista Served by Sewer (95% of future total inside Sierra Vista)	197.18	1,167.95	55.99

The total amount of effluent recharge was calculated by multiplying the percentage of Sierra Vista's total population attributable to CBP (limited by those served by sewer) by the total recharge reported by Sierra Vista in 2005 (2,897 AF):

$$\text{Portion of Sierra Vista's Recharge Attributable to Each CBP Component} = \frac{\text{Total Sierra Vista Recharge in 2005} * \% \text{ of Sierra Vista Population Attributable to Each CBP Component}}{\text{Total Sierra Vista Recharge in 2005}}$$

3.2.7.2 Septic Tank Passive Recharge

The Fort's BA and USFWS's BO identified septic systems as a commonly credited groundwater recharge source. The report notes that the USPP has adopted a septic recharge rate of 70% of indoor water use, which is estimated to be 69 GPCD (ADWR, 2008). The Fort's BA and USFWS's BO then applied this level of septic recharge to the 5% of Sierra Vista's population that is not served by the sewer system and to all of the unincorporated areas of the Subwatershed. This approach was applied to each CBP component by using the unincorporated population numbers previously calculated for each CBP component (see Table 6). Then 5% of the population attributable to CBP within Sierra Vista was added. These calculations were repeated based on future personnel levels. The population attributable to CBP that uses septic tanks is shown in Table 9.

Table 9. CBP Population on Septic Tanks

	CBP A&M	USBP Naco Station	OFO
Current Unincorporated Area Population	53.48	448.73	40.46
Current Portion of CBP Sierra Vista Population on Septic (5%)*	7.34	56.03	2.95
Current Total CBP Population on Septic	60.82	504.76	43.41
Future Unincorporated Area Population	76.01	492.28	40.46
Future Portion of CBP Sierra Vista Population on Septic (5%)*	10.38	61.47	2.95
Future Total CBP Population on Septic	86.39	553.75	43.41
*Calculated using the total inside Sierra Vista values in Table 8 .			

The amount of septic tank recharge was then calculated using the following equation:

$$\text{Portion of Septic Tank Recharge Attributable to Each CBP Component} = \frac{\text{Total Population Attributable to Each CBP Component on Septic} * 69 \text{ GPCD} * 70\% * 365 \text{ Days}}{325,851 \text{ gal}}$$

3.2.8 Net Water Use

Net water use accounts for total water use and total mitigation attributable to each CBP component. It is calculated by subtracting total mitigation from total water use. Net water use will be the target of future mitigation and conservation efforts. These calculations were repeated based on future personnel levels.

3.2.9 Construction Water Use

Expansion of CBP's A&M facility and the USBP Naco Station will also have population impacts in the Subwatershed. Those population impacts will have a temporary water use impact, which must be quantified. The Project Team considered impacts of the facility expansion projects and determined induced population as a result. CBP's A&M facility expansion is assumed to take one year, and the BPS expansion is assumed to take 18 months.

EIFS II Model inputs were similar to those described above (Section 3.2.2.2). For each construction project, the following data were input:

- 1) Change in local expenditures – annual construction costs.
- 2) Change in civilian employment – estimated number of construction workers based on the total construction costs.

- 3) Average income of affected civilian – average 2006 construction worker wages for Cochise County, inflated by 6 percent.
- 4) Percent expected to relocate – 100 percent.

These inputs provided indirect and induced employment figures. The percent of working and unemployed individuals relative to the total population of Cochise County was applied to those figures to arrive at the temporary construction induced population. As with the induced population, zip code data were used to determine the proportion of the total number of CBP employees that live in Sierra Vista, and that proportion was applied to the temporary construction induced population. **Table 10** shows the temporary construction population reduced to just that within the Subwatershed and split into incorporated and unincorporated areas.

Table 10. CBP Temporary Construction Population Living in the Subwatershed

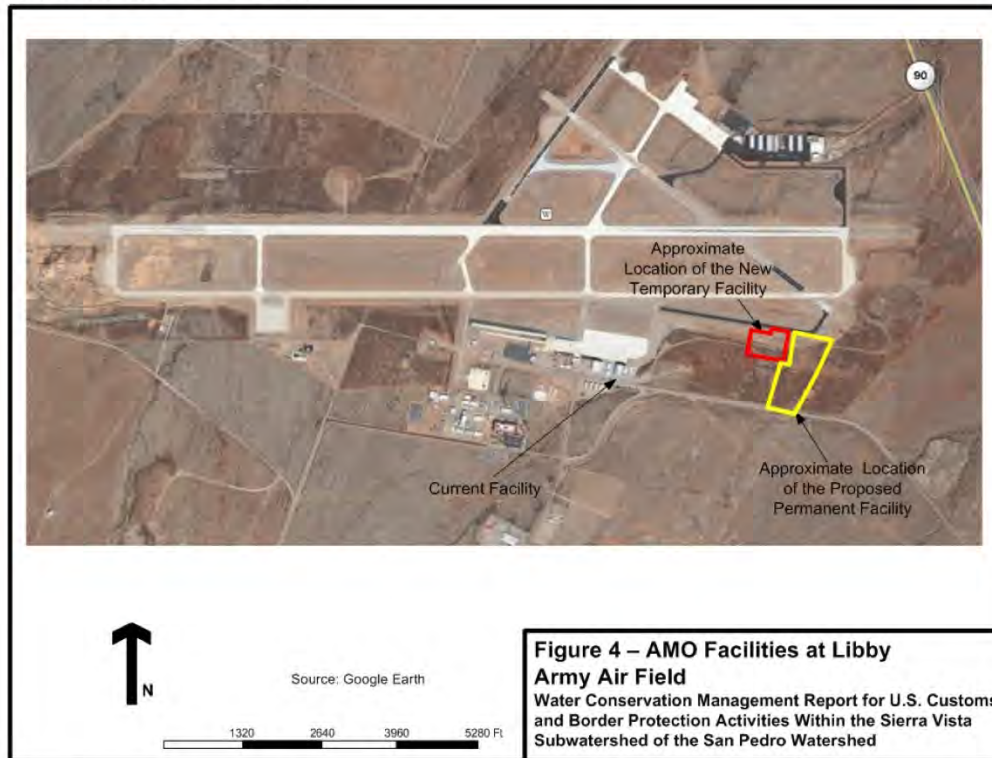
	CBP A&M	USBP Naco Station
CBP Construction Population (from EIFS II)	53	263
% Inside Subwatershed (based on zip code data)	59.57%	81.77%
CBP Construction Population in Subwatershed	31.57	215.07
CBP Construction Population in Incorporated Areas (69%)	21.79	148.4
CBP Construction Population in Unincorporated Areas (31%)	9.79	66.67

Using the temporary construction induced population, the method for determining net water use (as described in Section 3.2.8) was then applied to the temporary construction induced population. As noted, this population impact is temporary and will occur only during the timeframe of project construction.

4.0 CBP AIR AND MARINE

CBP A&M is currently deploying the MQ-9 Predator Unmanned Aircraft System (UAS) in support of CBP's strategic mission to secure U.S. borders against terrorists, means of terrorism, illegal drugs, and other illegal activities. CBP A&M also provides operational end users with the technology and capabilities to detect and prevent terrorist attacks and other illegal activities. The strategic plan for UAS Operations describes the intent of CBP A&M to provide intelligence, surveillance, and reconnaissance in the southwest, along the Northern Border, and in the Gulf Region. In order to implement this plan and operate within the National Airspace System, CBP A&M has been working closely with the Federal Aviation Administration for appropriate Certificates of Approval for operations in both restricted and controlled airspace.

CBP A&M currently operates out of temporary facilities located on LAAF at Fort Huachuca. **Figure 4** shows an aerial photograph of a portion of LAAF with indications of the current and proposed locations of CBP A&M facilities.



CBP's A&M facilities currently have a total of 47 personnel: 22 CBP personnel, and 25 contractors. Five of the contractors are assigned to CBP A&M on temporary duty (TDY).

CBP A&M plans to expand both the number of personnel and facilities. Future personnel level is projected to be 69 employees. A UAS Squadron, consisting of six Predator B aircraft, is planned for permanent assignment to Fort Huachuca. The Predator B will have 38 full-time employees assigned, consisting of air interdiction agents, observers, and maintenance and administrative staff members. The Air Unit assigned to Fort Huachuca will consist of up to five AS-350 size aircraft. Permanently assigned personnel will include as many as 17 individuals comprised of air interdiction agents and maintenance personnel. As operations and mission requirements dictate, provisions to host temporarily a variety of other aircraft are also under consideration and are included in planning for facility space needs. In addition to air operations, plans also include a group of approximately 14 individuals providing procurement services from this location. The total of 69 personnel includes the 47 personnel currently on-site.

Proposed new facilities include 21,000 square feet of UAS hangar space, 11,340 square feet of Air Unit hangar space, 33,510 square feet of combined administrative office, a 90,000 square foot aircraft parking ramp, 17,980 square feet of vehicle parking, and 2,660 square feet of ground support equipment and hazardous material storage. All square footage is approximate and will be finalized as design plans are completed. As with existing facilities, the new facilities will be located within the Subwatershed.

4.1 CBP A&M Subwatershed Population

Water use by the CBP A&M population living outside the Subwatershed has no impact on the water budget of the Sierra Vista Subwatershed and therefore is not considered in calculating total water use. To calculate total water use, the current and future total populations within the Subwatershed attributable to CBP A&M were determined as depicted in Sections 3.2.1 through 3.2.3.

TDY personnel were handled differently from permanent personnel in this calculation. Since they are not permanent residents and have not relocated to the Subwatershed with their families, they were counted as single individuals when employee family population was calculated. At the time of this report, five personnel were assigned as TDY. The assumption was made that all TDY personnel reside in Sierra Vista and that the proportion of TDY personnel at current staffing levels would remain when projecting the number of TDY personnel at future staffing levels.

Table 11 shows the total current and future CBP A&M population within the Subwatershed, divided between incorporated and unincorporated areas.

Table 11. Current and Future CBP A&M Population within Subwatershed

	Current Number of Persons	Future Number of Persons
CBP A&M Employees (from zip code data)	28	41
CBP A&M Employee and Family	62.52	84.20
CBP A&M Induced Population	110	161
Total CBP A&M Population	172.5	245.20
Total CBP A&M Incorporated (69%)	119.03	169.19
Total CBP A&M Unincorporated (31%)	53.48	76.01

4.2 CBP A&M Direct Water Use

Fort Huachuca provides all water to users on the base from groundwater wells operated by the Fort. Water deliveries to CBP A&M are not separately metered, so no records of actual water use exist for CBP A&M activities on the base. According to CBP A&M staff, there is no landscaping or vehicle washing on the premises. The Predator aircraft are electric and, according to program staff, are not washed with water. Program activities are not seasonal but rather consistent throughout the year. CBP and some contractors use a portable toilet located by the program trailer. Some contractors use the communal bathroom located in Hangar 1. CBP A&M staff estimate that water use is less than 10 GPED. Because of the limited water use associated with program activities, 10 GPED has been selected as a conservative estimate of the actual water use.

Table 12 shows current and future water use and assigned personnel. Given the location of LAAF, this water use occurs in the Subwatershed. Estimates of water use by CBP A&M are conservative.

Table 12. Current Annual CBP A&M Direct Water Use

	Number of Assigned Staff	Workplace GPED	Annual Direct Water Use (AF/YR)*
Current CBP A&M	47	10	0.53
Future CBP A&M	69	10	0.77

*Determined by multiplying GPED by the number of days in a year by the number of staff. That value is then divided by 325,851.

4.3 CBP A&M Employee, Family, and Induced Water Use

Section 3.2.5 describes the methods used to determine CBP A&M's induced water use. **Table 13** summarizes the results of these calculations.

Table 13. Current and Future CBP A&M Population Water Use within Subwatershed

Population Type	Number of Persons	GPCD	Annual Water Use (AF/YR)
Total Current CBP A&M Incorporated (69%)	119.03	160	21.33
Total Current CBP A&M Unincorporated (31%)	53.48	118	7.07
Total Current CBP A&M Population Water Use			28.4
Total Future CBP A&M Incorporated (69%)	169.19	160	30.32
Total Future CBP A&M Unincorporated (31%)	76.01	118	10.05
Total Future CBP A&M Population Water Use			40.37

In these calculations, assumptions were made that TDY personnel do not have families living within the Subwatershed and that the TDY personnel themselves reside within the incorporated area of Sierra Vista. The current proportion of TDY personnel to total personnel was used in projecting the future level of TDY personnel.

4.4 Industrial Pumping within Subwatershed

To be consistent with the Fort's BA and the USFWS's BO, Section 3.2.6 describes the methods used to determine CBP A&M's water use associated with industrial pumping in the subwatershed. **Table 14** lists the calculated percentage of Subwatershed population attributable to CBP A&M and the resultant portion of industrial pumping attributable to CBP A&M.

Table 14. Current and Future Subwatershed Population and Industrial Pumping Attributable to CBP A&M

	Current	Future
Total CBP A&M Subwatershed Population	172.5	245.2
Percentage of Total Subwatershed Population	0.225%	.221%
Industrial Pumping Attributable to CBP A&M (AF/YR)	2.82	2.77

4.5 Existing or Planned Mitigation

In order to determine net water use attributable to CBP A&M within the Subwatershed, the effect of current or planned future mitigation efforts that serve to offset water use within the Subwatershed had to be characterized. For CBP A&M the existing mitigation efforts are direct recharge of wastewater by Fort Huachuca, effluent recharge by the City of Sierra Vista, and passive recharge from septic tanks within the Subwatershed.

4.5.1 Direct Recharge of Wastewater by Fort Huachuca

Wastewater at Fort Huachuca is collected and treated at Wastewater Treatment Plant #2, which is a tertiary treatment facility. Fort Huachuca operates and maintains the treatment plant, which has a capacity to handle up to 3.1 million gallons per day (mgd). All effluent is directly reused or recharged within the Subwatershed. Wastewater treatment plays a major role in the Army's multi-tiered water resource management program that aims to guide effective management and conservation of Fort Huachuca's water resources. To facilitate effluent recharge, Fort Huachuca completed the construction on Phase I of an Effluent Recharge and Reuse Project in 2002. This \$6 million project included upgrading the wastewater treatment plant to improve effluent quality and construction of seven effluent recharge basins and one stormwater recharge basin. The basins are located on the East Range of Fort Huachuca, where effluent holding/evaporation ponds were previously located. All basins have received treated effluent for recharge and are reported to function well. Rapid infiltration rates have been reported with limited evaporative loss. The basins are designed to recharge up to 1,000 AF of water annually. The stormwater basin has sufficient capacity to recharge annually at least 250 AF of urban runoff from the built-up areas of Fort Huachuca, depending on precipitation.

In 2005, Fort Huachuca reported withdrawals of 1,403 AF of groundwater and 426 AF of recharge, which resulted in a 30 percent recharge rate. Since CBP A&M's water use is part of the Fort's total water use, this 30 percent recharge rate also applies to its estimated water use. **Table 15** shows how existing recharge by the Fort impacts CBP A&M's direct water use.

Table 15. Current and Future Effluent Recharge of CBP A&M Direct Water Use

	Direct Water Use (AF/YR)	Amount Recharged (AF/YR)
Current	0.53	0.16
Future	0.77	0.23

4.5.2 Sierra Vista Effluent Recharge

Section 3.2.7.1 identifies the City of Sierra Vista's ongoing effluent recharge efforts. Since Sierra Vista is a primary population center in the Subwatershed, many CBP A&M employees and much of the induced population live in Sierra Vista where wastewater is treated and recharged. The addition of recharged effluent into the aquifer is a direct offset to groundwater use by CBP A&M employees, their families, and the induced population. Using the method described in Section 3.2.7.1, **Table 16** summarizes the resulting portion of effluent recharge attributable to the CBP A&M population living in the City of Sierra Vista.

Table 16. Number of Persons and Amount of Sierra Vista Effluent Recharge Attributable to CBP A&M

	Current	Future
Total CBP A&M Inside Sierra Vista Served by Sewer (95% of Total)	139.45	197.18
Total CBP A&M Inside Sierra Vista as a Percentage of Sierra Vista's Population	0.423%	0.346%
CBP A&M's Portion of Sierra Vista's Effluent Recharge (AF/YR)	12.26	14.25

4.5.3 Septic Tank Passive Recharge

Consistent with the Fort's BA and the USFWS's BO, Section 3.2.7.2 describes the method and calculations for considering septic tank recharge as identified by the USPP. **Table 17** summarizes the population using septic tanks and septic tank recharge that is attributable to CBP A&M.

Table 17. CBP A&M Population on Septic Tanks and Septic Tank Recharge

	Current	Future
CBP A&M Unincorporated Area Population	53.48	76.01
Portion of CBP A&M Sierra Vista Population on Septic (5%)	7.34	10.38
Total CBP A&M Population on Septic	60.82	86.39
CBP A&M Septic Recharge (AF/YR)	3.27	4.65

4.5.4 Net Water Use

As identified in Section 3.2.8, net water use accounts for total water use and total mitigation attributable to CBP A&M. **Table 18** presents a summary of water use, recharge, and net water use for current and future CBP A&M personnel levels.

Table 18. Summary Table for CBP A&M Water Use, Recharge and Net Water Use

	Current (AF/YR)	Future (AF/YR)
Incorporated Area Water Use	21.33	30.32
Unincorporated Area Water Use	7.07	10.05
Direct Water Use	0.53	0.77
CBP A&M Portion of Industrial Water Use	2.82	2.77
Total Water Use	31.75	43.91
Direct Effluent Recharge by Fort Huachuca	0.16	0.23
CBP A&M Portion of Sierra Vista Effluent Recharge	12.26	14.25
CBP A&M Population's Septic Tank Recharge	3.27	4.65
Total Mitigation	15.69	19.13
Net Water Use	16.06	24.78

4.5.5 Construction Induced Net Water Use

As discussed in Section 3.2.9, the planned expansion for CBP A&M will have an economic impact on the Subwatershed population. This population impact is temporary and will occur only during construction of the permanent facility, which is expected to occur over a period of one year.

4.5.5.1 Construction Induced Water Use

Using the EIFS model, the subsequent population values in **Table 10**, and the calculation method described in Section 3.2.5, the Project Team projected the temporary induced construction population. Water use by CBP A&M's construction induced population is 3.9 AF in incorporated areas and 1.3 AF in unincorporated areas.

Direct pumping for construction purposes was estimated to be 0.7 AF based on factors from the ADWR's Demand Calculator (www.azwater.gov). CBP A&M's construction induced population within the Subwatershed of 31.57 represents 0.069% of the Subwatershed's population based on a total population of 76,503 (AZDOC, 2006). Using that same percentage and the equation in Section 3.2.6, 0.9 AF of industrial pumping within the Subwatershed can be attributed to CBP A&M's construction induced population. **Table 19** summarizes these values.

Table 19. CBP A&M Temporary Construction Population and Resultant Water Use

	Population	Water Use (AF)
Construction Population	53	
% Inside Subwatershed	59.57%	
Construction Population in Subwatershed	31.57	
Construction Population in Incorporated Areas	21.79	3.91
Construction Population in Unincorporated Areas	9.79	1.29
Direct Construction Water Use		0.67
Portion of Industrial Water Use		0.87
Total Water Use		6.74

4.5.5.2 Construction Induced Existing Mitigation

In order to determine net water use attributable to CBP A&M's construction induced population within the Subwatershed, the effect of current or planned future mitigation efforts that serve to offset water use within the Subwatershed had to be characterized. For CBP A&M's construction induced population, existing mitigation efforts include effluent recharge by the City of Sierra Vista and passive recharge from septic tanks within the Subwatershed. The percentage of population in Sierra Vista that could be attributed to CBP A&M's construction induced population was determined (through the model) to be 0.077%.

Using that percentage and the calculations in Section 3.2.7.1, the amount of existing effluent recharge by the City of Sierra Vista which could be attributed to CBP A&M's construction induced population is 2.24 AF. Assuming that 31% of the induced population lives in an unincorporated area and that 5 percent of the incorporated, induced population uses a septic system, the calculation in Section 3.2.7.2 was applied to determine that 0.60 AF is recharged by septic tanks. **Table 20** summarizes the calculations for determining total existing mitigation that offsets water use by CBP A&M's construction induced population.

Table 20. CBP A&M Temporary Construction Population and Resultant Mitigation

	Population	Mitigation (AF)
Construction Population in Sierra Vista	26.87	
% of Sierra Vista Population	0.077%	
Construction Portion of Sierra Vista Recharge		2.24
Septic Tank Recharge Attributable to Construction Population		0.60
Total Existing Recharge		2.84

4.5.5.3 Construction Induced Net Water Use

In order to determine net water use from CBP A&M's construction induced population and direct water use from construction activities, total existing recharge is subtracted from total water use.

Table 21 shows this calculation.

Table 21. CBP A&M Temporary Construction Population Net Water Use

	Water Use (AF)
Total Water Use	6.74
Total Existing Recharge	2.84
Net Water Use	3.90

4.6 Summary of CBP A&M Water Use

Table 22 contains a summary of all water use categories calculated for CBP A&M.

Table 22. Summary of Current, Future and Construction Water Use by CBP A&M

	Current (AF/YR)	Future (AF/YR)
Total Water Use	31.75	43.9
Total Existing Recharge	15.69	19.13
Net Water Use	16.06	24.78
Construction Water Use	3.90 AF	
* Water associated with construction is not an annual amount and was not included in the total.		

4.6.1 Net Water Mitigation Obligation

The potential current net water mitigation obligation that may be required for CBP A&M is 16.06 AF/YR. While construction is underway, it may be necessary to mitigate for construction induced net water use for 3.90 AF, as a one-time water use event. When the facility expansion at LAAF is complete and fully staffed to expected levels, the potential net water mitigation obligation that may be required for CBP A&M will be 24.78 AF/YR.

Since future water use levels are based on projected staffing levels, water use estimates will change based on the number of actual personnel. The net water mitigation obligation may be calculated by dividing the total net water mitigation obligation by the number of assigned personnel. The calculation follows:

$$\text{Potential Mitigation Requirement per CPB A\&M Personnel} = \frac{\text{Annual Estimated Mitigation Requirement}}{\text{Assigned personnel}}$$

This calculation yields a per employee mitigation obligation which encompasses all water use within the Subwatershed that can be attributed to CBP A&M. Each personnel assigned to CBP A&M would use 0.36 AF/YR of water that may need to be returned to the regional aquifer or otherwise offset. This figure includes direct use by CBP A&M, water use by families of CBP A&M personnel residing within the Subwatershed, and water use by the induced population residing in the Subwatershed.

5.0 U.S. BORDER PATROL NACO STATION

The priority mission of the USBP is preventing terrorists and terrorists' weapons, including weapons of mass destruction, from entering the U.S. The USBP Naco Station in Naco, Arizona is one of eight stations within the USBP's Tucson Sector. The USBP Naco Station's area of responsibility (AOR) is located within Cochise County in southeast Arizona. It covers approximately 1,175 square miles, including 32.5 miles of International Boundary with the areas of Agua Prieta, Naco, and Cananea, Mexico. The station's AOR begins west of Douglas, Arizona and continues west through the San Pedro River Valley to the crest of the Huachuca Mountains in the Coronado National Forest.

Sections of the Dragoon, Mule, Huachuca, and Whetstone mountain ranges are included in the Station's AOR, along with a large part of the Coronado National Forest and its canyons. The San Pedro River starts in Mexico near Cananea and flows north into the U.S. through the USBP Naco Station's AOR near Palominas, Arizona.

The AOR includes the cities and towns of Sierra Vista, Hereford, Palominas, Huachuca City, Whetstone, Tombstone, Bisbee, and Naco. The USBP Naco Station AOR also includes sections of Arizona State Highways 92, 80, 90, and 82. The BPS has a temporary highway checkpoint near milepost 304 on Highway 90, north of Sierra Vista, outside the Subwatershed.

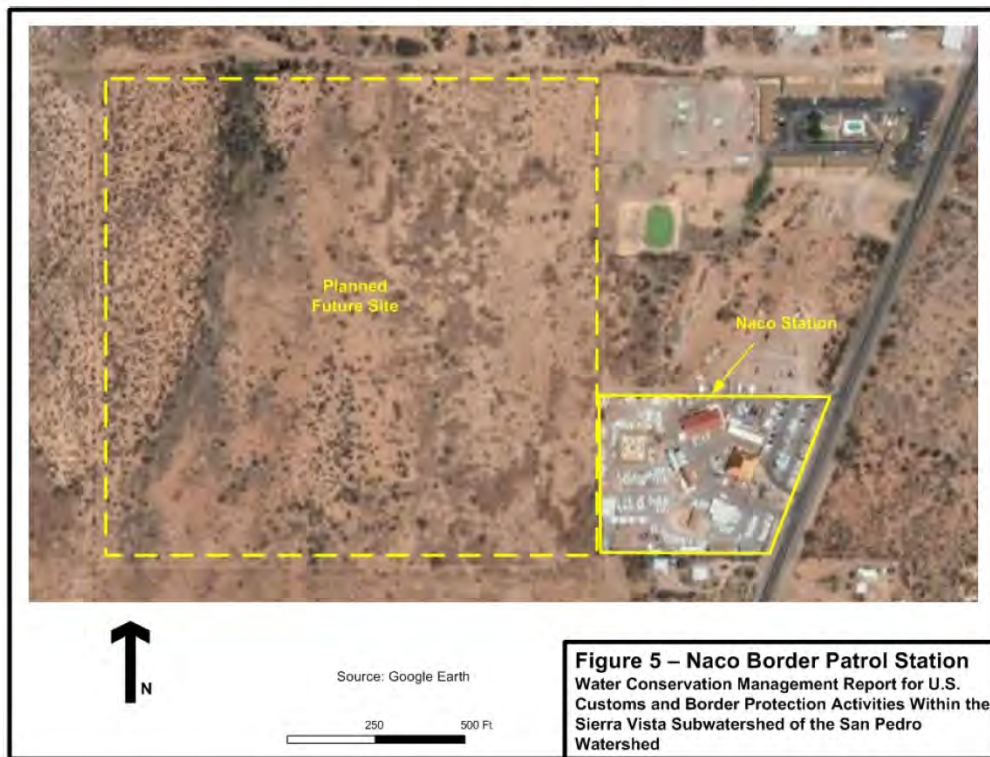
Figure 5 contains an aerial photograph of the current USBP Naco Station and the area of the proposed new station. According to Station staff, 417 agents are assigned to the existing facility. Design is underway for an expansion of the facilities at the USBP Naco Station. The expansion will consist of 50,000 square feet of administration and detention space and 30,000 square feet intended for a vehicle maintenance facility and ancillary site development. The USBP Naco Station expansion is a site adaptation of the Casa Grande BPS design and will have a design capacity of 450 personnel.

As previously discussed, there are currently 417 agents assigned to the USBP Naco Station. The current facility consists of the following:

- Main administration building.
- Training building.
- Butler-style garage with car wash sprayer.
- Modular building for supervisory offices and locker rooms.
- Modular building for illegal alien detention and processing.

- Modular building that facilitates musters and training exercises and provides space for a computer server room.
- Modular building for storage.
- Modular building for offices.
- Modular building for dispatch.
- Modular building for additional offices, issue room, training and muster.
- Horse corral.

No landscaping is present at the existing BPS, as can be seen from the aerial photograph (Figure 5).



The USBP Naco Station contains a processing area, which includes a temporary holding facility for detainees. The facility does not include showers or a kitchen. The temporary holding facility is used to process detainees until they are either returned to Mexico or transferred to a detention facility located outside the area. Larger detention facilities are better equipped to hold detainees for long

periods of time. USBP Naco Station typically holds detainees between three and ten hours until transferred.

5.1 USBP Naco Station Subwatershed Population

Water use by the USBP Naco Station population living outside the Subwatershed has no impact on the water budget of the Sierra Vista Subwatershed and therefore is not considered in calculating total water use. To calculate total water use, the current and future total populations within the Subwatershed attributable to USBP Naco Station were determined as depicted in Sections 3.2.1 through 3.2.3. **Table 23** shows the total current and future USBP Naco Station population within the Subwatershed, divided between incorporated and unincorporated areas.

Table 23. Current and Future USBP Naco Station Population within Subwatershed

	Current Number of Persons	Future Number of Persons
USBP Naco Station Employees (from zip code data)	341	368
USBP Naco Station Employee and Family	852.5	920
USBP Naco Station Induced Population	595	668
Total USBP Naco Station Population	1,447.5	1,588
Total USBP Naco Station Incorporated (69%)	998.78	1,095.72
Total USBP Naco Station Unincorporated (31%)	448.73	492.28

5.2 USBP Naco Station Direct Water Use

The USBP Naco Station receives water service from the Arizona Water Company, a private water company that operates with authority from the Arizona Corporation Commission. Monthly water billing was provided and reviewed from calendar year 2007 to determine the current annual water use of the facility. **Table 24** shows the monthly water usage as reported by the Arizona Water Company billing records.

**Monthly Water Usage at USBP Naco Station
Table 24. According to Arizona Water Company**

Date	Gallons	AF
1/18/2007	50,700	0.155593
2/20/2007	66,800	0.205002
3/19/2007	52,800	0.162037
4/18/2007	54,400	0.166947
5/17/2007	46,900	0.143931
6/19/2007	55,800	0.171244
7/19/2007	52,300	0.160503
8/17/2007	46,900	0.143931
9/20/2007	63,400	0.194567
10/19/2007	46,800	0.143624
11/19/2007	41,000	0.125824
12/19/2007	36,300	0.111401
Annual Total	614,100	1.884604

Factoring in the staff level of at the time of the report (345) personnel (as of 2007), this annual direct water use computes to a 4.88 GPED, calculated as follows:

$$GPED = \text{Annual Water Use (AF)} \times 325,851 \text{ gals/AF} \div \text{number of personnel} \div 365 \text{ days/yr.}$$

The actual water bills from the Arizona Water Company have been included in Appendix E. Table 25 shows the current and future water use and personnel level. Given the location of USBP Naco Station, this water use occurs in the Subwatershed.

Table 25. Current and Future Annual USBP Naco Station Direct Water Use

	Number of Assigned Staff	Workplace GPED	Annual Direct Water Use (AF/YR)
Current USBP Naco Station	417	4.88	2.28
Future USBP Naco Station	450	4.88	2.46

5.3 USBP Naco Station Employee, Family, and Induced Water Use

Section 3.2.5 describes the methods used to determine USBP Naco Station's induced water use.

Table 26 summarizes the results of these calculations.

Table 26. Current and Future USBP Naco Station Population Water Use within Subwatershed

Population Type	Number of Persons	GPCD	Annual Water Use (AF/YR)
Total Current USBP Naco Station Incorporated (69%)	998.78	160	179
Total Current USBP Naco Station Unincorporated (31%)	448.73	118	59.31
Total Current USBP Naco Station Population Water Use			238.31
Total Future USBP Naco Station Incorporated (69%)	1,095.72	160	196.38
Total Future USBP Naco Station Unincorporated (31%)	492.28	118	65.07
Total Future USBP Naco Station Population Water Use			261.45

5.4 Industrial Pumping within Subwatershed

To be consistent with the Fort's BA and the USFWS's BO, Section 3.2.6 describes the methods used to determine USBP Naco Station's water use associated with industrial pumping in the subwatershed. Table 27 lists the calculated percentage of Subwatershed population attributable to USBP Naco Station and the resultant portion of industrial pumping attributable to USBP Naco Station.

Table 27. Current and Future Subwatershed Population and Industrial Pumping Attributable to USBP Naco Station

	Current	Future
Total USBP Naco Station Subwatershed Population	1,447.5	1,588
Percentage of Total Subwatershed Population	1.892%	1.434%
Industrial Pumping Attributable to USBP Naco Station (AF/YR)	23.65	17.93

5.5 Existing or Planned Mitigation

In order to determine net water use attributable to USBP Naco Station within the Subwatershed, the effect of current or planned future mitigation efforts that serve to offset water use within the Subwatershed had to be characterized. For USBP Naco Station the existing mitigation efforts are

reuse of effluent produced from wastewater at USBP Naco Station, planned rainwater harvesting and retention basins at USBP Naco Station, effluent recharge by the City of Sierra Vista and passive recharge from septic tanks within the Subwatershed.

5.5.1 Reuse of Effluent Produced from Wastewater at USBP Naco Station

At the USBP Naco Station, all structures currently connect to an on-site septic system. DHS' Laguna Niguel Facilities Center is removing the USBP Naco Station from the septic system and connecting it to sewer services provided by the City of Bisbee. Bisbee treats its wastewater to a quality suitable for discharge or reuse. Bisbee currently discharges treated wastewater to Greenbush Draw, a tributary to the San Pedro River, and delivers up to 530 AF/YR to the Turquoise Valley Golf Course (TVGC) offsetting the golf course's historical groundwater use. TVGC is located immediately north of Naco, Arizona.

Wastewater generation can be between 60 and 90 percent of total water delivered. Where landscape water use is limited, such as the USBP Naco Station, which has little exterior water use, 90 percent or more of the water use at the facility is expected to return as wastewater (Metcalf and Eddy, 2003). There is no publicly available data on the rate at which wastewater entering the Bisbee treatment system exits as effluent, but system and treatment losses should result in a 90 percent return. Subsequently, **1.85 AF/YR** of effluent produced from the USBP Naco Station wastewater will be delivered to the TVGC or Greenbush Draw. Based on a future personnel level of 450, **1.99 AF/YR** of effluent produced from USBP Naco Station wastewater will be delivered to the TVGC or Greenbush Draw.

5.5.2 Planned Rain Harvesting and Retention Basins at USBP Naco Station

The proposed BPS facility will be designed using Leadership in Energy and Environmental Design (LEED) standards. Current plans include capturing rainfall in constructed retention basins as part of conservation measures incorporated at the site. Based on calculations provided by the BPS project manager, annual rainfall on the 40 acre site will result in 35 AF/YR of water recharged in retention basins. **Appendix F** includes detailed calculations from the BPS project manager. As noted on the calculations, this estimate is a gross approximation of the total runoff captured by the on-site retention basins.

5.5.3 Sierra Vista Effluent Recharge

Section 3.2.7.1 identifies the City of Sierra Vista's ongoing effluent recharge efforts. Since Sierra Vista is a primary population center in the Subwatershed, many USBP Naco Station employees and

much of the induced population live in Sierra Vista where wastewater is treated and recharged. The addition of recharged effluent into the aquifer is a direct offset to groundwater use by USBP Naco Station employees, their families, and the induced population. Using the method described in Section 3.2.7.1, **Table 28** summarizes the resulting portion of effluent recharge attributable to the USBP Naco Station population living in the City of Sierra Vista.

Table 28. Number of Persons and Amount of Sierra Vista Effluent Recharge Attributable to USBP Naco Station

	Current	Future
Total USBP Naco Station Inside Sierra Vista Served by Sewer (95% of Total)	1,064.61	1,167.95
Total USBP Naco Station Inside Sierra Vista as a Percentage of Sierra Vista's Population	3.230%	2.050%
USBP Naco Station's Portion of Sierra Vista's Effluent Recharge (AF/YR)	93.58	84.42

5.5.4 Septic Tank Passive Recharge

Consistent with the Fort's BA and the USFWS's BO, Section 3.2.7.2 describes the method and calculations for considering septic tank recharge as identified by the USPP. **Table 29** summarizes the population using septic tanks and septic tank recharge that is attributable to USBP Naco Station.

Table 29. USBP Naco Station Population on Septic Tanks and Septic Tank Recharge

	Current	Future
USBP Naco Station Unincorporated Area Population	448.73	492.28
Portion of USBP Naco Station Sierra Vista Population on Septic (5%)	56.03	61.47
Total USBP Naco Station Population on Septic	504.76	553.75
USBP Naco Station Septic Recharge (AF/YR)	27.16	29.79

5.5.5 Net Water Use

As identified in Section 3.2.8, net water use accounts for total water use and total mitigation attributable to USBP Naco Station. **Table 30** is a summary of water use, recharge, and net water use for current and future USBP Naco Station personnel levels.

Table 30. Summary of USBP Naco Station Water Use, Recharge and Net Water Use

	Current (AF/YR)	Future (AF/YR)
Incorporated Area Water Use	179	196.38
Unincorporated Area Water Use	59.31	65.07
Direct Water Use	2.28	2.46
USBP Naco Station Portion of Industrial Water Use	23.65	17.93
Total Water Use	264.24	281.84
Reuse of Effluent Produced from Wastewater at USBP Naco Station	1.85	1.99
Planned Rain Harvesting and Retention Basins at USBP Naco Station	0	35
USBP Naco Station Portion of Sierra Vista Effluent Recharge	93.58	84.42
USBP Naco Station Population's Septic Tank Recharge	27.16	29.79
Total Mitigation	122.59	151.2
Net Water Use	141.65	130.64

5.5.6 Construction Induced Net Water Use

As discussed in Section 3.2.9, the planned expansion for USBP Naco Station will have an economic impact on the Subwatershed population. This population impact is temporary and associated with the timeframe of the construction project. For the USBP Naco Station expansion, the project is assumed to have a construction period of 18-months.

5.5.6.1 Construction Induced Water Use

Using the EIFS model, the subsequent population values in **Table 10**, and the calculation method described in Section 3.2.5, the Project Team projected the temporary induced construction population. Water use by the USBP Naco Station construction induced population is 26.6 AF/YR in incorporated areas and 8.8 AF/YR in unincorporated areas.

Direct pumping for construction purposes was estimated to be 5.35 AF based on factors from the ADWR's Demand Calculator (www.azwater.gov). USBP Naco Station's construction induced population within the Subwatershed of 215.07 represents 0.344% of the Subwatershed's population based on a total population of 76,503 (AZDOC, 2006). Using that same percentage and the equation in Section 3.2.6, 4.3 AF/YR of industrial pumping within the Subwatershed can be attributed to USBP Naco Station's construction induced population. **Table 31** summarizes these values.

Table 31. USBP Naco Station Temporary Construction Population and Resultant Water Use

	Population	Water Use (AF/YR)
Construction Population	263	
% Inside Subwatershed	81.77%	
Construction Population in Subwatershed	215.07	
Construction Population in Incorporated Areas	148.40	26.60
Construction Population in Unincorporated Areas	66.67	8.81
Direct Construction Water Use		5.35
Portion of Industrial Water Use		4.30
Total Water Use in One Year		45.06
Total Water Use Over 18-Month Period		67.59

5.5.6.2 Construction Induced Existing Mitigation

In order to determine net water use attributable to USBP Naco Station’s construction induced population within the Subwatershed, the effect of current or planned future mitigation efforts that serve to offset water use within the Subwatershed had to be characterized. For USBP Naco Station’s construction induced population, existing mitigation efforts include effluent recharge by the City of Sierra Vista and passive recharge from septic tanks within the Subwatershed. The percentage of population in Sierra Vista that could be attributed to USBP Naco Station’s construction induced population was determined (through the model) to be 0.480%.

Using that percentage and the calculations in Section 3.2.7.1, the amount of existing effluent recharge by the City of Sierra Vista which could be attributed to CBP A&M’s construction induced population is 13.90 AF/YR. Assuming that 31% of the induced population lives in an unincorporated area and that 5 percent of the incorporated, induced population uses a septic system, the calculation in Section 3.2.7.2 was applied to determine that 4.06 AF/YR is recharged by septic tanks. **Table 32** summarizes the calculations for determining total existing mitigation that offsets water use by the Naco Station construction induced population.

Table 32. USBP Naco Station Temporary Construction Population and Resultant Mitigation

	Population	Mitigation (AF/YR)
Construction Population in Sierra Vista	166.5	

% of Sierra Vista Population	0.480%	
Construction Portion of Sierra Vista Recharge		13.90
Septic Tank Recharge Attributable to Construction Population		4.06
Total Existing Recharge in One Year		17.96
Total Existing Recharge Over 18-Month Period		26.94

5.5.6.3 Construction Induced Net Water Use

In order to determine net water use from the USBP Naco Station's construction induced population and direct water use from construction activities, total existing recharge is subtracted from total water use. Table 33 shows this calculation.

Table 33. USBP Naco Station Temporary Construction Population Net Water Use

	Water Use (AF)
Total Water Use	67.59
Total Existing Recharge	26.94
Net Water Use	40.65

5.6 Summary of USBP Naco Station Water Use

Table 34 contains a summary of all water use categories calculated for USBP Naco Station.

Table 34. Summary of Current, Future and Construction Water Use by USBP Naco Station

	Current (AF/YR)	Future (AF/YR)
Total Water Use	264.24	281.84
Total Existing Recharge	122.59	151.2
Net Water Use	141.65	130.64
Construction Water Use	40.65 AF	
* Water associated with construction is not an annual amount and was not included in the total.		

5.6.1 Net Water Mitigation Obligation

The potential current net water mitigation obligation that may be required for USBP Naco Station is 141.65 AF/YR. While construction is underway, it may be necessary to mitigate for construction induced net water use for 40.65 AF, as a one-time water use event. When the facility expansion at the Naco Station is complete and fully staffed to expected levels, the potential net water mitigation obligation that may be required for USBP Naco Station will be 130.64 AF/YR.

Since future water use levels are based on projected staffing levels, water use estimates will change based on the number of actual personnel. The net water mitigation obligation may be calculated by dividing the total net water mitigation obligation by the number of assigned personnel. The calculation follows:

$$\text{Potential Mitigation Requirement per CPB A\&M Personnel} = \frac{\text{Annual Estimated Mitigation Requirement}}{\text{assigned personnel}}$$

This calculation yields a per employee mitigation obligation which encompasses all water use within the Subwatershed that can be attributed to USBP's Naco Station. Each personnel assigned to Naco Station would use 0.29 AF/YR of water that may need to be returned to the regional aquifer or otherwise offset. This figure includes direct use by USBP Naco Station, water use by families of USBP Naco Station personnel residing within the Subwatershed, and water use by the induced population residing in the Subwatershed.

6.0 OFFICE OF FIELD OPERATIONS AT THE NACO PORT OF ENTRY

OFO Officers perform the full range of inspection, intelligence analysis, examination, and law enforcement activities relating to arrival and departure of persons, conveyances, and merchandise at the POE. The Officer's primary responsibility is to identify potential terrorists and instruments of terror and to perform layered enforcement activities relative to counter-terrorism. These enforcement activities are to prevent the entry of terrorists and instruments of terror, harmful pests and diseases, illegal drugs and contraband, and illegal aliens and importations/exportations contrary to law and trade agreements, etc., from entering/exiting the U.S. The Naco POE is open 24 hours per day and is most easily reached by turning south onto Naco Highway from Arizona Highway 92.

The OFO operates in the U.S. General Services Administration (GSA) complex in Naco, Arizona within the Subwatershed. The POE is also occupied by the Arizona Department of Transportation (ADOT) and the Federal Motor Carrier Safety Administration (FMCSA). GSA, ADOT and FMCSA staffing levels have not been incorporated as part of CBP's mitigation obligations.

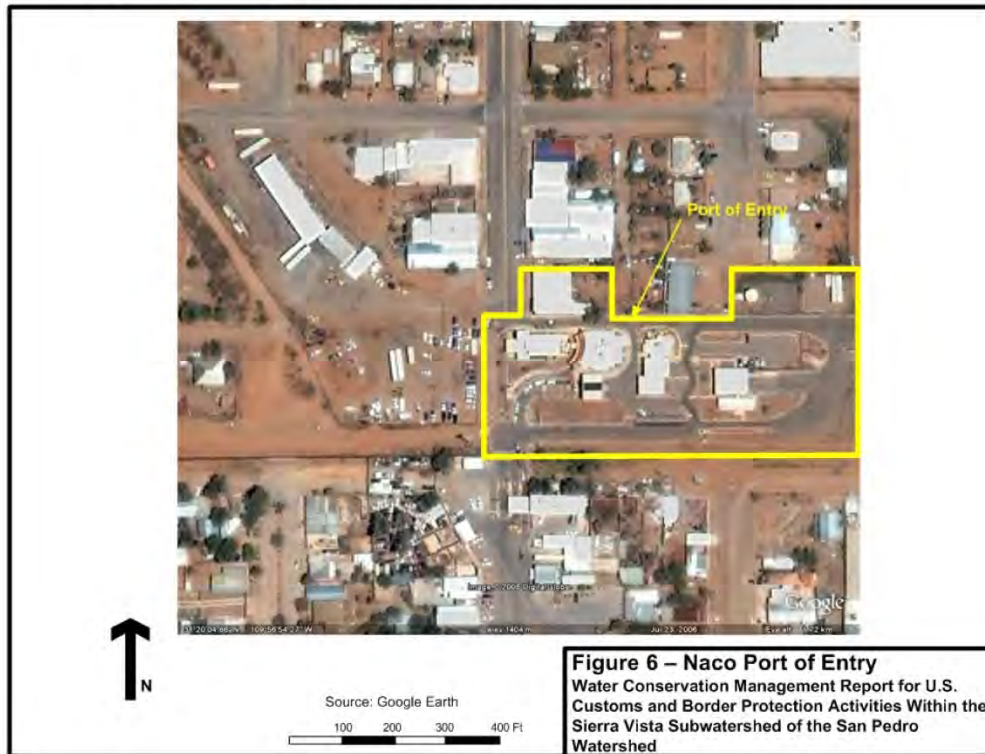
Unlike the other two CBP components serving as the subject of this report, the OFO has no current plans to expand or otherwise change the level of deployment at the Naco POE. Throughout this section, only the current personnel levels and concern with water conservation and water mitigation will be addressed. Unless otherwise stated in this section, OFO officers are assigned to the Naco POE.

The Naco POE, under ownership of the GSA, consists of the following structures:

- Three-story, 8,928 square feet main building
- 3,938 square feet primary building
- 3,748 square feet secondary building
- 2,560 square feet commercial truck dock, and
- 3,748 square feet ADOT building.

Figure 6 presents an aerial photograph of the Naco POE facilities. Desert landscaping is present around the facilities, and the facilities include 10 toilets, 12 sinks, and 4 showers. These facilities accommodate 38 full-time OFO employees at the Naco POE. The facility is manned 24-hours per day.

Naco Water Company provides water service to the Naco POE. The Naco Sanitary District (NSD) provides sewer service to the Naco POE. NSD has a small system to treat wastewater to secondary levels, suitable for disposal using evaporation ponds. The facility is not permitted for effluent discharge, effluent recharge, or effluent reuse. Groundwater monitoring wells are used to ensure groundwater supplies are not negatively impacted by wastewater disposal.



6.1 OFO Subwatershed Population

Water use by the OFO population living outside the Subwatershed has no impact on the water budget of the Sierra Vista Subwatershed and therefore is not considered in calculating total water use. To calculate total water use, the current and future total populations within the Subwatershed attributable to OFO were determined as depicted in Sections 3.2.1 through 3.2.3. **Table 35** shows the total current OFO population within the Subwatershed, divided between incorporated and unincorporated areas.

Table 35. Current OFO Population within Subwatershed

	Current Number of Persons
OFO Employees	31
OFO Employee and Family	77.5
OFO Induced Population	53
Total OFO Population	130.5
Total OFO Incorporated (69%)	90.05
Total OFO Unincorporated (31%)	40.46

6.2 Current Direct Use

The Naco POE receives water service from the Naco Water Company, a private water company that operates with authority from the Arizona Corporation Commission. The water company provided 2007 monthly water use data that was reviewed to determine the current annual water use for the entire facility, which includes OFO and other tenants. **Table 36** shows the monthly water usage as reported by the Naco Water Company water use records.

Table 36. Monthly Water Usage at Naco POE According to Naco Water Company

Date	Gallons	AF
1/23/2007	12,500	0.038361
2/26/2007	12,200	0.03744
3/23/2007	11,900	0.03652
4/24/2007	15,300	0.046954
5/23/2007	12,900	0.039589
6/21/2007	14,800	0.04542
7/23/2007	16,100	0.049409
8/23/2007	13,200	0.040509
9/24/2007	12,800	0.039282
10/23/2007	12,200	0.03744
11/20/2007	14,200	0.043578
12/20/2007	13,300	0.040816
Annual Total	161,400	0.495318

The facility is not equipped with individual meters for OFO and the other building tenants, so total OFO, ADOT, and FMCSA staff levels (45 personnel) were considered to arrive at the total annual water use of 9.83 GPED. **Appendix G** contains the actual water use spreadsheets from the Naco Water Company. This GPED applied to the number of OFO employees at the Naco POE (38 personnel) results in total direct water use of 0.42 AF/YR.

6.3 OFO Employee, Family and Induced Water Use

Section 3.2.5 describes the methods used to determine OFO's induced water use. **Table 37** summarizes the results of these calculations.

Table 37. Current and Future OFO Population Water Use within Subwatershed

Population Type	Number of Persons	GPCD	Annual Water Use (AF/YR)
Total Current OFO Incorporated (69%)	90.05	160	16.14
Total Current OFO Unincorporated (31%)	40.46	118	5.35
Total Current OFO Population Water Use			21.49

6.4 Industrial Pumping within Subwatershed

To be consistent with the Fort's BA and the USFWS's BO, Section 3.2.6 describes the methods used to determine OFO's water use associated with industrial pumping in the subwatershed. **Table 38** lists the calculated percentage of Subwatershed population attributable to OFO and the resultant portion of industrial pumping attributable to OFO.

Table 38. Current Subwatershed Population and Industrial Pumping Attributable to OFO

	Current
Total OFO Subwatershed Population	130.5
Percentage of Total Subwatershed Population	0.171%
Industrial Pumping Attributable to OFO (AF/YR)	2.13

6.5 Existing or Planned Mitigation

In order to determine net water use attributable to OFO within the Subwatershed, the effect of current or planned future mitigation efforts that serve to offset water use within the Subwatershed had to be characterized. The Naco POE does not currently participate in any active mitigation efforts. The POE's wastewater is not handled in a manner contributing any significant amount of water to the aquifer. As a tenant of the GSA, modifying these disposal methods is not within the direct command and control of the OFO. For OFO the existing mitigation efforts are effluent recharge by the City of Sierra Vista and passive recharge from septic tanks within the Subwatershed.

6.5.1 Sierra Vista Effluent Recharge

Section 3.2.7.1 identifies the City of Sierra Vista's ongoing effluent recharge efforts. Since Sierra Vista is a primary population center in the Subwatershed, many OFO employees and much of the induced population live in Sierra Vista where wastewater is treated and recharged. The addition of recharged effluent into the aquifer is a direct offset to groundwater use by OFO employees, their families, and the induced population. Using the method described in Section 3.2.7.1, **Table 39** summarizes the resulting portion of effluent recharge attributable to the OFO population living in the City of Sierra Vista.

Table 39. Number of Persons and Amount of Sierra Vista Effluent Recharge Attributable to OFO

	Current
Total OFO Inside Sierra Vista Served by Sewer (95% of Total)	55.99
Total OFO Inside Sierra Vista as a Percentage of Sierra Vista's Population	0.170%
OFO's Portion of Sierra Vista's Effluent Recharge (AF/YR)	4.92

6.5.2 Septic Tank Passive Recharge

Consistent with the Fort's BA and the USFWS's BO, Section 3.2.7.2 describes the method and calculations for considering septic tank recharge as identified by the USPP. **Table 40** summarizes the population using septic tanks and septic tank recharge that is attributable to the OFO.

Table 40. OFO Population on Septic Tanks and Septic Tank Recharge

	Current
OFO Unincorporated Area Population	40.46
Portion of OFO Sierra Vista Population on Septic (5%)	2.95
Total OFO Population on Septic	43.41
OFO Septic Recharge (AF/YR)	2.34

6.5.3 Net Water Use

As identified in Section 3.2.8, net water use accounts for total water use and total mitigation attributable to OFO. **Table 41** is a summary of water use, recharge, and net water use for current and future OFO personnel levels.

Table 41. Summary of OFO Water Use, Recharge and Net Water Use

	Current (AF/YR)
Incorporated Area Water Use	16.14
Unincorporated Area Water Use	5.35
Direct Water Use	0.42
OFO Portion of Industrial Water Use	2.13
Total Water Use	24.04
OFO Portion of Sierra Vista Effluent Recharge	4.92
OFO Population's Septic Tank Recharge	2.34
Total Mitigation	7.26
Net Water Use	16.78

6.6 Summary of OFO Water Use

Table 42 contains a summary of all water use categories calculated for OFO.

Table 42. Summary of Current Water Use by OFO

	Current (AF/YR)
Total Water Use	24.04
Total Existing Recharge	7.26
Net Water Use	16.78

6.7 Net Water Mitigation Obligation

The potential current net water mitigation obligation that may be required for OFO is 16.78 AF/YR. Since future water use levels are based on projected staffing levels, water use estimates will change based on the number of actual personnel. The net water mitigation obligation may be calculated by dividing the total net water mitigation obligation by the number of assigned personnel. The calculation follows:

$$\text{Potential Mitigation Requirement per CPB A\&M Personnel} = \text{Annual Estimated Mitigation Requirement} \div \text{assigned personnel}$$

This calculation yields a per employee mitigation obligation which encompasses all water use within the Subwatershed that can be attributed to the OFO. Each personnel assigned to the OFO would use 0.44 AF/YR of water that may need to be returned to the regional aquifer or otherwise offset. This figure includes direct use by OFO, water use by families of OFO personnel residing within the Subwatershed, and water use by the induced population residing in the Subwatershed.

7.0 SUMMARY OF ALL WATER USE BY CBP COMPONENTS WITHIN THE SUBWATERSHED

The previous sections of this report detail how net water use by each CBP component was calculated. First, each CBP component's portion of Subwatershed water use was calculated based on their percentage of total Subwatershed population. Then the amount of existing or planned mitigation which could be attributed to each CBP component was calculated. The difference between these two calculations yields net water use. Construction water use for the expansions at LAAF and the USBP Naco Station also were calculated. **Table 43** summarizes the figures for each CBP component.

Table 43. Summary Water Use for Each CBP Component

	Current (AF/YR)			Future (AF/YR)	
	CBP A&M	USBP Naco Station	OFO	CBP A&M	USBP Naco Station
Total Water Use	31.75	264.24	24.04	43.91	281.84
Total Existing Recharge	15.69	122.59	7.26	19.13	151.2
Net Water Use	16.06	141.65	16.78	24.78	130.64
Construction Water Use	3.90 AF	40.65 AF			

Notes: Total amounts have been rounded. Construction Water Use is a one-time activity, not an on-going annual obligation. The Naco POE has no current plans for expansion; expansion activities would be the responsibility of GSA.

8.0 WATER CONSERVATION MEASURES

Water conservation measures serve to reduce the amount of water use for which mitigation may be required. Any efforts undertaken to reduce water use will result in a net reduction in potential water mitigation. In order to evaluate water conservation measures, it is necessary to assess which measures are suitable for each facility.

USPP has outlined numerous conservation measures. Only a handful of these conservation measures are deemed suitable for implementation by CBP, as most measures are largely targeted at municipalities and involve incentives or ordinances which encourage or require certain water conserving activities by residents of the Subwatershed. There are a few measures suitable for implementation by CBP at one or more of the component facilities. These measures are discussed in detail in this section.

Each CBP entity has direct control over only a small percentage (direct water use) of the total water use attributed to their economic impact on the Subwatershed. This relationship presents unique challenges. It should be noted that while CBP may have to mitigate for employee domestic and induced water use, CBP has little opportunity to reduce those sources of water demand. As such, the proposed conservation measures are all targeted at the water used directly by the CBP component facilities.

8.1 Indoor Plumbing Retrofits and New Installation

In order to optimize indoor water use efficiency, the USPP recommends retrofitting with low-flow or in some cases no-flow versions of showerheads, toilets, faucets, evaporative cooler reuse pumps, and similar pumps for decorative fountains. Evaporative coolers can be replaced by air conditioners, two-stage evaporative coolers, or heat pumps. In the institutional setting, automatically closing faucets, dual flush toilets, and waterless urinals can be installed or included in the design of new facilities. Waterless urinals use a chemical trap in place of a water trap to avoid sewer gas venting. Waterless urinals are widely utilized throughout commercial, public, and institutional buildings in the Subwatershed despite concerns over potential odor problems and the possibility of sewer gasses or airborne bacteria or viruses venting from the sewer system. **Figure 7** contains photographs of a typical waterless urinal in a non-residential setting and a cross-sectional diagram of a waterless urinal.



Figure 7a – Typical Commercial Waterless Urinal Installation

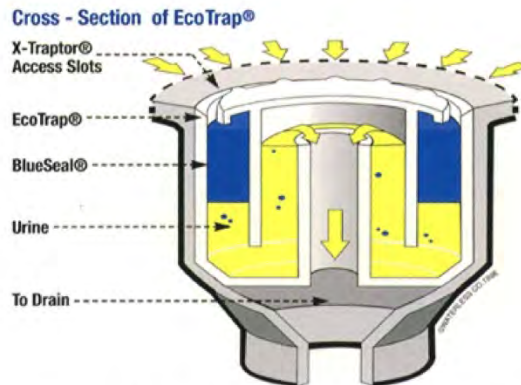


Figure 7b – Cross-Section of typical Waterless Urinal

Figure 7 – Waterless Urinal
 Water Conservation Management Report for U.S.
 Customs and Border Protection Activities Within the
 Sierra Vista Subwatershed of the San Pedro
 Watershed

CBP would incur certain costs in the effort to retrofit existing plumbing fixtures. CBP could also incur higher maintenance costs with waterless urinals. While rebates are available for replacing high-flow toilets with low-flow versions, those rebates are available only to residential customers. CBP would not only reduce total water use through retrofitting existing plumbing fixtures, it also would experience a commensurate water bill decrease. Although conservation alternatives reduce the volume of water that could potentially be recharged, conservation upfront is more efficient than over-consuming water and then recharging generated wastewater.

8.1.1 CBP A&M

The Army and CBP signed a Land-Use Permit renewal in 2006 that gives CBP use of the space on which the existing facilities are located through May 31, 2011. As a tenant organization, CBP A&M is not in a position to retrofit existing facilities. Nevertheless, as part of the Fort's existing conservation efforts, approximately 460 waterless urinals have been installed on post and are likely currently in use by CBP staff and contractors.

For new facilities, the Universal Plumbing Code has been adopted as an Arizona State Statute and requires that new construction use low-flow water use fixtures. While the Federal Government is not required to comply with State codes, they can be used as a guideline for water conserving appliances. Waterless urinals go a step farther than the plumbing code and are estimated to save between 10,000 and 15,000 gallons of water per year over a modern low-flow urinal. Low-flow and no-flow fixtures should be considered in the design phase of the new facilities at LAAF.

Installation of a water meter is recommended to determine actual water usage. Actual water use data could help reduce the amount of water attributed to CBP A&M use and, in turn, could provide more accurate information to address mitigation requirements.

8.1.2 USBP Naco Station

With a total of fourteen bathrooms at a facility built in 1987, an opportunity may be available at Naco Station to retrofit existing bathroom facilities with low-flow or no-flow fixtures. The proposed BPS will be designed using LEED standards, which promote water conservation and efficiency. Current plans include capturing incidental rainfall as part of conservation measures for the site. Other conservation measures are planned for the new station. Discussion of those elements will be incorporated in the on-going EA.

8.1.3 OFO at Naco POE

The Naco POE is owned and operated by the GSA. As such, the OFO is not in a position to directly retrofit existing facilities. The Naco POE has no plans for expansion.

8.2 Graywater Reuse

Graywater is lower quality than potable water, but of higher quality than black water. Graywater derives from water uses such as bathtubs, showers, washing machines, and bathroom sinks. Blackwater is water flushed from toilets and, unless treated, is not suitable for reuse. Water from kitchen sinks, garbage disposals, and dishwashers is also usually considered blackwater because of high concentrations of organic waste and other pathogens.

This alternative involves installing indoor graywater collection systems to reuse water from interior water fixtures. Graywater is not suitable for all water uses and is most commonly used for drip or flood irrigation of non-edible landscape plants. Utilizing graywater on exterior landscaping can save groundwater and reduce water costs.

Graywater use is regulated in Arizona and is permitted as long as it is kept on the subject property and is not used to irrigate edible plants. Non-residential installation of graywater collection systems requires a Type 3 Reclaimed Water General Permit for Graywater from the Arizona Department of Environmental Quality (AZDEQ).

CBP would incur costs to install graywater reuse systems in the existing facilities. Nevertheless, this technique can be included when designing new facilities. Water savings would derive from not pumping additional groundwater for outside irrigation. CBP not only would reduce total water usage through the reuse of graywater, it would also see a commensurate water bill decrease. Graywater reuse would capture flows that otherwise would become wastewater and thus would reduce the volume of water that could potentially be recharged. Assuming graywater usage would offset groundwater consumption (that otherwise would occur), direct reuse of graywater is more efficient than recharging generated wastewater.

8.2.1 CBP A&M

The Army and CBP signed a Land-Use Permit renewal in 2006 that gives CBP use of the space on which the existing facilities are located through May 31, 2011. As a tenant, CBP A&M is not in a position to retrofit existing facilities. For the new facilities, graywater reuse could be included as a design feature. CBP A&M's use of greywater is restricted by two relevant limitations:

- The first is that graywater is captured from showers, bathroom sinks, and washing machines. Except for bathroom sinks, the CBP A&M facilities do not have significant graywater producing fixtures.
- Secondly, graywater reuse is only an effective conservation method if it ultimately is used in place of a potable water supply. Furthermore, it can only be used for non-potable purposes, such as landscape irrigation. Therefore, landscape features must have existed already and must have been receiving potable water for the introduction of graywater to result in water conservation.

CBP A&M facilities have no landscaping and thus are not a candidate facility for graywater reuse. Since CBP A&M will be a tenant organization on Fort Huachuca, it will be required to comply with U.S. Army water conservation measures.

8.2.2 USBP Naco Station

The USBP Naco Station has fourteen bathrooms and two showers, which could produce graywater. Since the USBP Naco Station has no landscaping, the primary exterior use of water is the car wash sprayer. While some states would allow a graywater system that would collect and pressurize graywater for use in car washing, Arizona limits the use of graywater to flood or drip irrigation. It is unlikely that use of graywater in the spray car wash would be deemed an appropriate use of this water supply. Alternatively, car wash water recycling systems are available, which would capture used car wash water and filter it for reuse.

The proposed BPS facility will be designed using LEED standards, which promote water conservation and efficiency. Current plans include capturing incidental rainfall as part of conservation measures for the site. Other conservation measures are planned for the new station. Discussion of those elements will be incorporated into the on-going EA.

8.2.3 OFO at Naco POE

The Naco POE is by the GSA. As such, the OFO is not in a position to directly retrofit existing facilities. The Naco POE has no current plans for expansion. As demonstrated in **Figure 6**, little to no exterior landscaping exists at the POE. As such, greywater reuse opportunities are limited for the OFO.

8.3 Large Water User Audits by the University of Arizona Cooperative Extension

Recognizing that conservation measures recommended by the USPP are general in nature, the USPP also encourages large commercial water users in the Subwatershed to undergo an in-depth audit of indoor and outdoor water use. Audits are performed through the University of Arizona Cooperative Extension's Water Wise program. Water use experts are available to conduct audits and suggest applicable changes to increase water use efficiency. CBP could request an audit of all three facilities in an effort to identify specific measures, which could be implemented to increase water use efficiency. The audit may identify water use activities which could be altered to reduce water consumption. In turn, staff at each facility would become responsible for implementing the recommended changes.

CBP would be affected by the cost of implementing the conservation efforts. However, CBP would not only reduce total water usage through adopting recommended conservation techniques, but it also would experience a commensurate water bill decrease. Although conservation alternatives reduce the volume of water that could potentially be recharged, conservation upfront is more efficient than over-consuming water and then recharging generated wastewater.

9.0 WATER MITIGATION MEASURES

After conservation efforts are considered, the remaining water use attributable to CBP within the Subwatershed may need to be mitigated in order to balance impacts on the Subwatershed's water supplies. Unlike conservation, mitigation seeks to find alternative supplies to augment local groundwater. Mitigation also may include reducing groundwater elsewhere in the Subwatershed. The goals of mitigation are to return water to the regional aquifer and/or reduce long-term withdrawals that could adversely impact groundwater and surface water supplies. Reducing the overdraft of groundwater will have the effect of maintaining flows in the San Pedro River, which will in turn support the rich wildlife habitat found in riparian areas along the river's banks.

The following sub-sections discuss three potential water mitigation strategies. One or more of these strategies could be implemented to achieve an overall water mitigation plan.

9.1 Rainwater Harvesting

Each year an average of 15.39 inches of rain falls at Fort Huachuca. Precipitation near Naco averages 17.65 inches per year. Much of that water is collected in the Subwatershed, but more than 97 percent is lost to evaporation. Rainwater may be collected and reused or recharged. Rainwater harvesting can be done at ground level, where the land is sculpted to create depressions that capture rainwater and allow it to penetrate the ground and irrigate plants. In addition, rainwater may be harvested from building rooftops by connecting roof gutters to a rainwater collection system. **Figure 8** includes photographs of a non-residential rooftop rainwater harvesting system and a diagram of a rainwater harvesting system.



Figure 8a – Rainwater Harvesting in a Non-Residential Setting

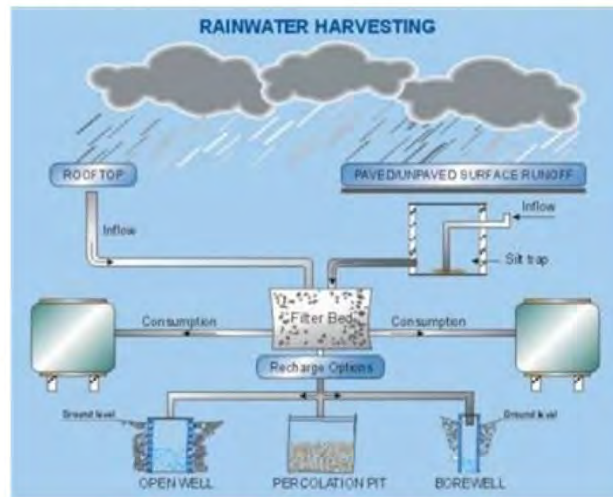


Figure 8b – Rainwater Harvesting Diagram

Note: The collection tanks shown in Figure 8a can be installed underground

Figure 8 – Rainwater Harvesting
Water Conservation Management Report for U.S. Customs and Border Protection Activities Within the Sierra Vista Subwatershed of the San Pedro Watershed

Although the photograph depicts above-ground storage tanks, rainwater storage tanks can be installed underground. Collected water is then stored for later use or delivered to a dry well or recharge basin for recharge into the aquifer. Use of a dry well is a relatively inexpensive way to augment groundwater recharge, but it may not have the same benefit as a constructed and managed recharge facility. The construction and operation of drywells are permitted through AZDEQ.

Rainwater harvesting may be installed on an existing building or incorporated into new construction. Construction and maintenance costs associated with the system may be offset somewhat by the resultant decrease in mitigation obligation.

9.1.1 CBP A&M

The Army and CBP signed a Land-Use Permit renewal in 2006 that gives CBP use of the space on which the existing facilities are located through May 31, 2011. As a tenant organization, CBP A&M is not in a position to retrofit existing facilities. For new facilities, rainwater harvesting could be included as a design feature. The land required to install the collection system and dry wells would need to be included in CBP A&M's contract with the Army. Furthermore, given the nature of this type of recharge activity, approval from the Fort would likely be required.

Based on the total square footage of the proposed structures (46,950 square feet) and an annual rainfall rate of 15.39 inches per year, approximately 1.38 AF/YR could potentially be captured from the proposed buildings at LAAF. Considering existing mitigation by the Fort, this quantity is twice as large as projected direct water use by CBP A&M. By recharging that supply, CBP A&M could reduce water demand that would require mitigation.

9.1.2 USBP Naco Station

The proposed BPS will be designed using LEED standards, which promotes water conservation and efficiency. Current plans include capturing rainfall in constructed retention basins as part of on-site conservation measures. Based on calculations provided by the BPS project manager, annual rainfall on the 40 acre site could result in 35 AF/YR of recharge in retention basins. **Appendix F** includes the detailed calculations from the BPS project manager. As noted on the calculations, this estimate is a gross approximation of the total runoff captured by the on-site retention basins. Because the rainwater harvesting and retention basins are already included in design for the expansion at the USBP Naco Station, the resultant recharge has been accounted for in future net water use.

9.1.3 OFO at Naco POE

The Naco POE is owned and operated by the GSA. As such, the OFO is not in a position to directly retrofit existing facilities. The Naco POE has no current plans for expansion.

9.1.4 Rainwater Harvesting – All Facilities

Approximately 4.45 AF of average annual groundwater augmentation can be achieved through implementation of rainwater harvesting at CBP's current and planned facilities in the Subwatershed. The actual augmentation will rely on actual rainfall and the effectiveness of these systems.

9.2 Shift from Septic to Sewer

Septic tanks are designed to temporarily hold wastewater in order to allow natural processes to partially breakdown waste material before allowing wastewater to flow to the leach field and seep back into the ground. Even with aquifer replenishment from septic systems, little control is available in terms of potential waste and groundwater contamination. Septic tanks can be replaced with a connection to a private or municipal sewer provider. Once a connection is made, the wastewater is then delivered to the wastewater treatment plant through underground pipes. The wastewater is treated and then disposed, discharged, reused, or recharged in an appropriate and controlled manner.

Formally treated wastewater is called effluent or reclaimed water. Disposal may consist of discharge to evaporation ponds, which do not contribute back to the aquifer if they are properly constructed. Discharging effluent into a natural waterway can augment available surface water and contribute back to the aquifer. Nevertheless, groundwater recharge is difficult to quantify and rarely is recognized as a contribution by the discharging party. Reuse of effluent can reduce groundwater demands but only when the effluent is used to meet a demand previously met by groundwater. Recharge of effluent involves the active process of putting water back into the aquifer either through infiltration ponds, which are managed to minimize evaporation, or through vadose zones or injection wells. When done properly, reuse and recharge methods result in the greatest benefit to the aquifer.

Of the three CBP components, only the USBP Naco Station is currently on a septic system. The CBP A&M is serviced by the Fort's wastewater collection and treatment system and the Naco POE is serviced by the NSD. The CBP Laguna Niguel Facilities Center and USBP are planning to shift the USBP Naco Station from the septic system to sewer service from the City of Bisbee. The City of Bisbee treats wastewater to a quality level suitable for both reuse and discharge. Effluent from Bisbee is reused on the TVGC in Naco and replace historic use of groundwater on this 100-year-old

course. Bisbee discharges remaining water to the Greenbush Draw during times of the year when golf course irrigation demands are lower. Although Bisbee is largely located just outside the Subwatershed, its water supply is derived from an Arizona Water Company well field located along Greenbush Draw (a tributary of the San Pedro River within the Subwatershed). The delivery of Bisbee effluent to both the golf course and the discharge location help offset Arizona Water Company's water export.

To assess how the shift from a septic system to a municipal sewer service would benefit the aquifer, the amount of wastewater the USBP Naco Station produces and the percentage of wastewater that ultimately makes it to the TVGC or Greenbush Draw must be established. These calculations were presented in Section 5.5.1. Because the conversion from septic tank to sewer is in process for the USBP Naco Station, the resultant recharge has been accounted for in current net water use.

9.3 Detention Basin Recharge

The City of Sierra Vista constructs detention basins in an effort to augment the amount of natural recharge within the Subwatershed. According to the City's website, detention basins work by capturing large amounts of fast moving water (typically from a storm) and then releasing that quantity slowly into the ground. Incoming water is captured in the detention basin's storage space. This water then is released slowly through a designed outlet structure where it seeps into the ground rather than running off as floodwater. The engineer must balance basin cost and size with the anticipated flows to derive the most efficient facility possible.

The City of Sierra Vista maintains eleven constructed stormwater basins within its limits. The basins have been funded with a combination of City and developer funds. The least expensive of the basins is the Busby Detention Basin. The cost to construct the basin was \$50,000. The basin has an 11.9 AF capacity and an estimated recharge rate of six AF/YR, which yields a capital cost of \$8,333 per AF of recharge capacity. Because the city already owned the land, acquisition costs were not included in this estimate.

Given this information, CBP could initiate a similar program of detention basin construction by purchasing land and/or identifying land already owned by CBP that would be suitable for detention basin construction. Nevertheless, actual construction costs, and recurring annual maintenance costs have not been established. Water collected and recharged within the basin would reduce the amount of water that would need to be mitigated by other means.

9.4 Conservation Easements for Agricultural Lands

A conservation easement is a legal agreement between a landowner and a third party, such as a land trust or government agency. Such an agreement permanently limits uses of land for the purpose of protecting its conservation values. Although a landowner still owns the land, by agreeing to an easement, they give up some rights associated with the land. Easements do not prevent the land from being sold or passed on to heirs, and the easement will remain in force should the land change ownership.

For CBP's purposes, conservation easements are aimed at reducing or eliminating water consumption along the San Pedro River and its tributaries. This objective is accomplished by property owners' relinquishing water rights in exchange for accepting a conservation easement. The reduced water use then can offset water used by CBP within the Subwatershed.

The U.S. Geological Survey has identified the shallow aquifer underlying the Babocomari River as one of the most important contributors to the San Pedro aquifer in the upper San Pedro Valley. As such, considerable conservation easement activity has occurred along the Babocomari River, which is a key tributary to the San Pedro River. Babocomari Ranch is located along the Babocomari River and its owner, the Brophy family, has been a willing participant in negotiating conservation easements. The most recent easement was purchased by The Nature Conservancy for \$1.9 million on behalf of Fort Huachuca in order to mitigate for the Fort's water use pursuant to its BO. The easement protects 487.3 acres of grasslands that contain valuable wetland habitat. As of September 2007, the total area protected along the Babocomari River stands at 1,410.2 acres and 4.61 miles of river reach. According to the Arizona Water Resource Newsletter from the University of Arizona's Water Resources Research Center, the Brophy family has identified about 16,000 acres of ranch they would like to see placed under conservation easements.

The Nature Conservancy also has worked with Fort Huachuca to acquire easements along the San Pedro River in the Palominas area. Unlike the Babocomari Ranch, The Nature Conservancy actually purchased the land and then established conservation easements, which restricted groundwater pumping and development. Once the easements were in place, The Nature Conservancy sold the property with the easements intact. As with the previous example, the Fort paid for the easements and received credit under its BO for the number of AF of water use the easements reduced.

The costs of conservation easements can vary widely. Cost is generally determined through a property appraisal by considering existing conditions and conditions under the potential easement. The appraised value depends on market conditions and the type and severity of restrictions under

the easement. The cost per AF of water mitigation is then calculated by dividing the easement acquisition price by the estimated reduction in net groundwater pumping.

10.0 BENEFITS, COSTS AND RISKS OF WATER CONSERVATION AND MITIGATION MEASURES

10.1 Water Conservation

Only three conservation programs have been identified as potentially applicable for CBP's facilities. Of these, only certain facilities are in a position to take advantage of all three programs. Considering these limited opportunities and the limited design information that is available regarding CBP's future facilities, only a generalized evaluation of benefits, costs, and risks can be provided at this time.

First, in terms of retrofitting indoor plumbing, only the USBP Naco Station controls its own facilities whereby it could pursue this measure. Indoor plumbing retrofits generally are worthwhile in the Western U.S. Water savings usually justify the costs of such programs, and risks are minimal in that low water using devices are well tested in the marketplace.

Second, in terms of graywater reuse, only the USBP Naco Station has a meaningful opportunity for implementation. This technique may be worth some consideration at both the existing facility and at any new facilities because of the availability of water outlets that can produce graywater and because of CBP's water need to wash cars at this site. Nevertheless, this technique may not lead to successful water mitigation as State restrictions limit use of graywater (car washing likely is not an acceptable use). In addition, these systems are uncommon and have rarely proven to justify their construction costs. A site-specific evaluation would help CBP make a decision about the viability of this option.

Finally, the large water user audits may be performed for the three facilities, but the benefits are uncertain given the water use characteristics of each site.

10.2 Water Mitigation

CBP also faces limitations regarding water mitigation options because only certain measures are applicable and because only certain facilities can take advantage of them. For instance, rainwater harvesting does not seem feasible for the Naco POE or for the temporary facilities at LAAF. Nevertheless, the USBP Naco Station and the new CBP A&M facility may be good candidates in the future. The permanent CBP A&M facility would be required to comply with U.S. Army requirements, which could warrant a more detailed study to determine risks, costs, and potential successes of such programs. Risks are evident given the limited track record of such programs and the fact that

rainwater might still have at least some benefit in natural recharge or recharge through a detention basins.

Detention basins appear to be a worthwhile program as demonstrated by their prominent use in the Subwatershed. More information would be needed to identify potential locations for the basins and associated costs, benefits, and risks. Conservation easements offer CBP high potential for water mitigation. At present, easement opportunities are available. Past experience has demonstrated low risk with this option.

From a broader perspective, CBP could incur important benefits by taking an active role in regional conservation efforts. CBP could start by prioritizing water conservation techniques in the design of its new facilities, by supporting wastewater recharge of the aquifer with local utilities, and by supporting municipal conservation programs that reduce water use.

11.0 CONCLUSIONS

This report has estimated current water use and mitigation and future water use of the three CBP components situated within the Subwatershed. Calculations are based upon staffing level and home location data provided by each CBP component. The total water use includes water used directly at each CBP component, water used at home by CBP employees and their families, water used by Subwatershed population induced by CBP's local economic activities, and a portion of industrial water use within the Subwatershed. The portion of industrial water use for each CBP component was based on the percentage of Subwatershed population which was attributable to each CBP component. CBP A&M, USBP Naco Station, and OFO at Naco POE have a total current water use of 320.03 AF/YR in the Subwatershed.

Current levels of existing mitigation caused by or associated with each CBP component have been calculated. Existing mitigation efforts include effluent recharge at Fort Huachuca, reuse of effluent, on-site rainwater harvesting, effluent recharge by the City of Sierra Vista and passive recharge by septic tanks. CBP A&M, USBP Naco Station, and OFO at Naco POE currently mitigate for 145.54 AF/YR in the Subwatershed. Based on total current water use and total current mitigation, net water use for all CBP components amounts to 174.49 AF/YR.

Two of the CBP entities plan to expand their facilities and increase assigned personnel. Defined as future conditions, the expansion of these facilities would increase water use. Under future conditions, total water use would be 349.79 AF/YR. Total future levels of mitigation would be 177.59 AF/YR. Future net water use would be 172.2 AF/YR. In addition, water use for construction is not a recurring debt to the Subwatershed and would only be mitigated once at the time of use. Total construction associated water use after factoring in existing mitigation is projected to be 44.55 AF.

Table 44 summarizes all water use, both current and future, including the estimated existing mitigation and potential obligation for each CBP component.

Table 44. Summary Water Use for Each CBP Component

	Current (AF/YR)			Future (AF/YR)	
	CBP A&M	USBP Naco Station	OFO	CBP A&M	USBP Naco Station
Total Water Use	31.75	264.24	24.04	43.91	281.84
Total Existing Recharge	15.69	122.59	7.26	19.13	151.2
Net Water Use	16.06	141.65	16.78	24.78	130.64
Construction Water Use	3.90 AF	40.65 AF			
Notes: Total amounts have been rounded. Construction Water Use is a one-time activity, not an on-going annual obligation. The Naco POE has no current plans for expansion; expansion activities would be the responsibility of GSA.					

Opportunities for CBP to implement conservation measures are limited by the fact that direct water use at CBP entities represents a small fraction of total water use. CBP has no direct command and control over the activities of its employees or their families at their homes within the Subwatershed. CBP also does not have command and control over the induced population, some of whom may have no relationship to CBP. Furthermore, mitigation opportunities are limited by infrastructure considerations. The most appealing option available to CBP, should mitigation be required, is to purchase conservation easements that would offset CBP water use in the Subwatershed.

12.0 REFERENCES AND WORKS CITED

- Arizona Department of Commerce, Arizona Subcounty Population Projections, July 1, 2006 to July 1, 2055 by County, Census County Division, Place, and Reservation.
- Arizona Department of Water Resources, Statewide Water Advisory Group Draft Plan for the Upper San Pedro, November 2008.
- ASL Hydrologic and Environmental Services, 1994, Sierra Vista Subwatershed Hydrology Primer, for City of Sierra Vista, Bella Vista Water Company, and Pueblo Del Sol Water Company, 29 p.
- City of Prescott, 2007, Annual Water Withdrawal and Use Report.
- City of Sierra Vista Website (<http://www.ci.sierra-vista.az.us>). Information on the Environmental Operations Park.
- Community Watershed Alliance of the Middle San Pedro Valley, March 2005, Calculation of Domestic Well GPCD Rates for the Upper San Pedro Basin Active Management Area Review Report.
- Department of Interior, 2008, Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona—2007 Report to Congress.
- Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison Fort Huachuca, Arizona. December 2006. Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona.
- Fluid Solutions and BBC Research and Consulting, 2002, Preliminary Cost/Benefit Analysis for Water Conservation, Reclamation and Augmentation Alternatives for the Sierra Vista Subwatershed, San Pedro Partnership.
- Groundwater Users Advisory Council of the Prescott Active Management Area, Safe-Yield Subcommittee, 2006, Final Report on Safe-Yield Impediments, Opportunities, and Strategic Directive.
- Metcalf and Eddy, Inc., 2003, Wastewater Engineering: Treatment and Reuse, 4th Edition, McGraw Hill, 1819 pp.

Missouri Department of Natural Resources, Thomas J. Dean, James H. Barks and James H. Williams, 1976, A Guide for the Geologic and Hydrologic Evaluation of Small Lake Sites in Missouri, Water Resources Report Number 31.

U.S. Fish and Wildlife Service (USFWS). 2007. Biological Opinion (BO) for the Department of the Army's proposed land use, military operations, and training range utilization at and near Fort Huachuca, Arizona, for 10 years. AESO/SE, 22410-2007-F-0132, 02-21-02-F-229, 02-21-98-F-266. USFWS, Phoenix, AZ. June 14, 2007.

Upper San Pedro Partnership, 2007, Riparian Areas and Change Fact Sheet.

13.0 REPORT PREPARERS

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Experience: Twenty four years of experience in providing hydrologic evaluations and water resource and wastewater services for public and private sector clients and for the Arizona Department of Water Resources and the USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. Expertise in hydrology, groundwater recharge investigations and facility development, wastewater reuse, land and water resource investigations, fluvial geomorphology, climatology, water resource evaluations, and water rights assessments. Mr. Lacey is one of the founding members of Fluid Solutions, founded in 1998. Prior experience included other consulting firms, Arizona Department of Water Resources, and US Forest Service.

Education:

M.A., Physical Geography, Arizona State University, Tempe, Arizona, 1987
B.A., Physical Geography, University of Delaware, Newark, Delaware, 1982

Ed Harvey - Economist

Experience: Ed Harvey joined BBC Research & Consulting in 1973 and served as a Managing Director of the firm from 1989 until 2002, when he formed a new firm, Harvey Economics. He has devoted the bulk of his career to water, mineral, energy and environmental resource studies and community change in the U.S. During his 35-year career, Mr. Harvey has worked extensively for public and private clients conducting economic, social, financial and market studies. His work has focused upon regulatory compliance or change, new business opportunities, and impacts upon businesses, employees, government and affected populations. Examples include economic and social impact analyses, feasibility studies, fiscal impact analyses, market assessments, resource demand projections and benefit-cost analysis. He has played a prominent role in public processes that are usually a part of Mr. Harvey's assignments. Considerable expert witness testimony experience is evident.

Education:

M.S.B.A., Economics, University of Denver, 1973
B.A., Economics, University of Denver, 1971

Christa McJunkin - Water Resource Analyst

Experience: Over 13 years of experience in the water resource and environmental field including seven years as a Water Resource Specialist and Supervisor for the Arizona Department of Water Resources Assured Water Supply program. Her experience also includes the analysis and approval of municipal Designations of Assured Water Supply in the Phoenix AMA, generation of population and water demand estimates for subdivision and city-wide planning efforts, analysis of well sites with regard to service area regulations and the planning and permitting of recharge recovery wells and service area wells.

Education:

M.A., Public Administration, Arizona State University, 2000
B.S., Environmental Science, Northern Arizona University, 1996

Jodie Snyder – Environmental Planner

Experience: Jodie has six years experience supporting Baker for environmental, planning, and water resources projects as an environmental and sustainability planner and Geographic Information Systems specialist. Jodie works closely with Baker’s Environmental and Engineering Departments to coordinate and conduct spatial analysis and to develop reports, maps, and other deliverables that comply with NEPA, the ESA, the Clean Water Act, and other related legislation. In addition, Jodie has worked extensively in the public involvement realm and is a LEED® Accredited Professional with a passion for creating sustainable sites and communities.

Education:

M.A.S., Environmental Policy and Management, University of Denver, 2007

B.A., Geography/Biology/Environmental Studies, Augustana College, 2004

Appendices for this report are available with the complete copy of the
Water Conservation Management Report.

APPENDIX C
WATER MITIGATION DOCUMENTATION



United States Department of the Interior



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In Reply Refer to:
AESO/SE
22410-2010-I-0421

June 30, 2010

Ms. Jennifer Haas
Acting Director, Environmental and Energy Division
U.S. Department of Homeland Security
Washington, DC 20229

RE: Review of Draft Biological Assessment for the Construction, Operation, and Maintenance of the New Customs and Border Protection, U.S. Border Patrol, Naco Station, Tucson Sector, Arizona

Dear Ms. Haas:

Thank you for your correspondence of May 4, 2010, received by us on May 6, 2010. Your letter requested our review of the proposed construction, operation, and maintenance of a new Customs and Border Protection (CBP), U.S. Border Patrol (USBP) Border Patrol Station (BPS; proposed action) south of West Della Street along South Naco Highway in Naco, Cochise County, Arizona, in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*).

Your letter concluded that the proposed action may affect, but is not likely to adversely affect the endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) and its critical habitat, the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*), the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and its critical habitat, the endangered desert pupfish (*Cyprinodon macularius*), and the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*). We concur with your determinations and provide our rationales below.

You requested concurrence that the proposed action is not likely to adversely affect the Ramsey Canyon leopard frog (*L. subaquavocalis*). In their 2008 list of amphibians and reptiles of North America north of Mexico, the Society for the Study of Amphibians and Reptiles reclassified *L. subaquavocalis* as the Chiricahua leopard frog. In a petition finding published in the Federal Register on December 16, 2009 [74 FR 66866], the U.S. Fish and Wildlife Service (FWS) officially recognized all populations of the Ramsey Canyon leopard frog as being members of the species *L. chiricahuensis*, the Chiricahua leopard frog.

You also requested concurrence that the proposed action is not likely to adversely affect the candidate yellow-billed cuckoo (*Coccyzus americanus*). Interagency consultation need not be performed for

candidate species, so an analysis will not be included in this document. We can provide technical assistance upon request, but note that you have already developed conservation measures to avoid and minimize effects to this species.

This review is based on: (1) your April 2010 *Draft Biological Assessment for the Construction, Operation, and Maintenance of the New Customs and Border Protection, U.S. Border Patrol, Naco Station, Tucson Sector, Arizona* (BA), transmitted with your May 4, 2010, letter; (2) the *Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the San Pedro Watershed* (WCMR, included as Appendix A to the BA); (3) the *Biological Survey Report for the Construction, Operation, and Maintenance of the New Customs and Border Protection, U.S. Border Patrol, Naco Station, Tucson Sector, Arizona* (BSR; included as Appendix B to the BA); (4) exchanges of project-related information via meetings, conference calls, and electronic mail between July 16, 2007, and June 24, 2010; (5) a June 24, 2010, electronic mail message transmitting three design and acquisition memoranda documenting your firm commitment of resources to mitigate the effects of the proposed action; and (6) various published and unpublished sources of information. Literature cited in this review is not a complete bibliography of all literature available on the species of concern, and its effects, or on other subjects considered in this review. A complete administrative record of this consultation is on file at this office.

Description of the Proposed Action

The BA and its appendices contain a detailed description of the proposed action, which is incorporated herein via reference. In brief, the proposed action is the construction, operation, and maintenance of an expanded BPS in Naco, Arizona. The current Naco BPS consists of a small building surrounded by several outbuildings and supports a total of 417 personnel. The proposed action includes a new station building, parking (for civilian vehicles, the agency fleet, and seized vehicles), a maintenance facility, all-terrain vehicle (ATV) storage, equine and canine facilities, a helipad, an indoor shooting range, and other related facilities. Once completed, the expanded Naco BPS will be staffed by a work force of up to 450 personnel.

The proposed conservation measures consist of actions intended to: (1) avoid effects to threatened and endangered species during construction of the facilities; and (2) comprehensive measures to reduce the use of water during construction and by personnel both at the facility and in the communities in which they reside.

The measures proposed to avoid and minimize the effects of the Naco BPS construction activities include:

- Construction activities will occur on the existing, largely-disturbed Naco BPS site
- Construction equipment will be transported to the site on existing roads
- Temporary, within-site access roads will be placed in areas requiring no vegetation removal
- Nighttime construction will be infrequent and of short duration, typically related to concrete pouring
- Nighttime illumination will likely require no more than ten 4-lamp units and each unit will be shielded

The measures proposed to conserve (i.e. avoid the use of) and mitigate (offset the residual consumption of) water at the Naco BPS, throughout the region by staff and their families, and by that fraction of the human population present because of the positive economic effects of your personnel's presence, include:

- Installation of low-flow plumbing fixtures and low- or no-flow, recirculating cooling fixtures
- Xeric landscaping
- Construction of buildings to Leadership in Energy and Environmental Design (LEED) Silver standards
- Installation of rainwater harvesting devices and detention/infiltration basins that will capture on-site rainwater and site drainage from impervious surfaces.
- Purchasing land off-site for the construction of detention/infiltration basins that will capture off-site rainwater and site drainage from impervious surfaces.
- Conversion from the existing septic system to a system that discharges to a sanitary sewer, the treatment plant which will subsequently recharge the treated effluent.
- Acquisition of conservation easements to reduce existing water uses and/or reduce the magnitude of future increases in water use on the conserved parcel.
- Acquisition of conservation easements that will curtail existing water use and or forego the future expansion of water use.

You have proposed to mitigate for one-time 40.7 acre feet of construction water use and the residual 130.64 acre-feet per annum (AFA) with four potential mitigation strategies. The first measure is the harvesting of rainwater, which will be stored for landscape and other uses. The rainwater/detention conservation measure could supply up to 35 AFA of infiltration over the 40-acre Naco BPS site; the actual value will vary based on observed rainfall and the efficiency of the infiltration facilities.

The second mitigation measure involves transitioning the Naco BPS from its current septic system to a sanitary sewer, which will conduct wastewater to the City Of Bisbee Wastewater Treatment Plant. The Bisbee facility discharges its treated effluent to either the Turquoise Valley Golf Course, which offsets pumping of groundwater, or to Greenbush Draw, which affects recharge. The water yield associated with this measure has been accounted for in the current net water demand because the septic-to-sewer transition is already in process.

The third mitigation measure is to use existing Customs and Border Protection-owned lands or to purchase other parcels in order to construct detention basins. These basins would be placed in order to detain and infiltrate elevated runoff from constructed, impervious areas. The ability for this conservation measure to mitigate water use is proven, but the actual value can only be determined if and when a site is selected, a project engineered, and the yield modeled and field verified.

The fourth measure is the acquisition of conservation easements to either reduce existing water use or to preclude future expansions in water use (i.e. from development at the existing zoning levels). Approximately 16,000 acres of the Brophy Ranch may be available to be placed under conservation easements. You have proposed and committed funding towards the acquisition of easements on 1,200 acres of these lands to mitigate for 130.46 AFA of water use (see Design Analysis excerpt and Water Use Funding Commitment memorandum transmitted with your June 24, 2010, electronic mail message).

Conclusions

We concur that the proposed action is not likely to adversely affect the Huachuca water umbel and its critical habitat, the Chiricahua leopard frog, the southwestern willow flycatcher and its critical habitat, the desert pupfish, and the Gila topminnow. The southwestern willow flycatcher is an obligate riparian bird and the remaining species are aquatic. The primary analysis of the effects of the proposed action is therefore based on the interactions between groundwater use, the regional aquifer, and discharges to the San Pedro River and its tributaries, including springs. Our rationales for concurrence appear in the respective species' sections that follow the hydrologic analysis.

San Pedro River Hydrology

The presence of the Naco BPS creates a positive economic impact that includes direct expenditures as well as expenditures by personnel and their families. These expenditures support an additional human population that would not be present in the area but for the presence of the Naco BPS.

The WCMR contains an economic impact analysis that derives the number of personnel, families, and the induced population; that analysis is incorporated herein via reference. Only those personnel within the Sierra Vista Subwatershed (SVS) are relevant to this analysis because it is their water use that potentially affects the San Pedro River. Personnel, families, and induced residents residing outside of the SVS affect other aquifers, though personnel use while present at the Naco BPS itself is relevant. Table 23 in the WCMR states that the total human population attributable to the Naco BPS within the SVS is currently 1447.5, and it will increase to 1,588 upon completion of the facility. The water used by this human population constitutes a potential, indirect effect to species occurring in and near the San Pedro River.

The WCMR (see Table 34) estimates the full suite of water uses associated with the Naco BPS and the human population directly and indirectly attributable to it. The WCMR's analysis is incorporated herein via reference but, in brief, the present-day gross water demand of the Naco BPS is calculated to be 264.24 AFA, and will increase to 281.84 AFA upon completion of the proposed action. Once the proposed water conservation measures (those which reduce water demand) are considered, the net water demand is anticipated to be 141.65 AFA and 130.64 AFA, respectively. The remainder of this section documents the proposed action's anticipated effects to regional baseflows in the San Pedro River. Subsequent, species-specific analyses will tier to this hydrologic analysis as applicable.

There are no appreciable surface water sources for human uses within the upper San Pedro River watershed; all water is pumped from the ground. A basic tenet of hydrology is that pumped groundwater derives either from ground water storage or capture of water from basin recharge or discharge. Groundwater in storage is that which resides in an aquifer. Such stored water may eventually discharge to a spring or waterway. Water used by plants through evapotranspiration is also categorized as discharge. Over time and under continual pumping, wells will increasingly deplete storage, capture water and, eventually, reverse the flow direction of ground water. In the case of the Naco BPS groundwater pumping, the captured subsurface water is that which would otherwise discharge to the San Pedro River or be consumed through evapotranspiration (ET) by the river's riparian vegetation. Declining groundwater levels thus lead to declines in riparian vegetation and the ecosystems associated with them (Stromberg *et al.* 1996).

The ratio between a given well's impacts to storage and capture varies between groundwater systems. In the SVS, we have partitioned the fraction of groundwater withdrawal from storage (55%) versus capture (45%) based on an average of the values resulting from groundwater modeling by Goode and Maddock (2000) (65 percent from storage); Freethey (1982) (56% from storage); Corell, *et al* (1996) (51% from storage), and Vionnet (1992) (48% from storage). Using this value, the total aquifer storage change from pumping attributable to the Naco BPS is estimated to be 77.91 AFA ($0.55 * 141.65$ AFA) under existing conditions. The remaining 45 percent of impacts of the Naco BPS are to natural discharge. Natural discharge is partitioned between two fates: riparian ET and baseflow in area streams. Leenhouts *et al.* (2006) determined that groundwater-derived ET consumes a maximum of 9,010 AFA (64%) of the San Pedro River's total natural discharge of 14,010 AFA. Baseflow discharge therefore accounts for the remaining 34% of natural discharge.

Riparian ET changes, shown in Column G of Table 1, below, are 40.79 AFA based on current Naco BPS water demand and are mitigated fully based on future water demand. The corresponding baseflow changes, shown in Column H and expressed in cubic feet per second (CFS), are 0.03 cubic feet per second (CFS) on current, partially-mitigated groundwater demand. The future groundwater demand is anticipated to be fully offset by implementation of the mitigation actions. It is thus anticipated that there will be no future baseflow impact from the Naco BPS.

Table 1: Hydrologic impact analysis. Note that values in columns B and C were derived from values appearing in Table 1-1 in the BA and Table 34 in the WCMR. Columns D, E, G, and H were calculated by FWS. Column F assumes that easement acquisition will fully mitigate for all hydrologic impacts not offset by other conservation measures. Naco BPS construction water use is not included, but will also be mitigated fully by conservation measures and easement acquisition.

A	B	C	D	E	F	G	H
Time	Gross groundwater demand (AFA)	Net demand (with conservation and recharge, without easements) (AFA)	Change in storage (55% of Column C) (AFA)	Change in natural discharge without easements (45% of Column C) (AFA)	Change in Natural Discharge with easements (AFA)	Change in ET (64% of Column F) (AFA)	Change in baseflow (36% of column F) (AFA), converted to CFS)
Current	264.24	141.65	77.91	63.74	63.74	40.79	0.03
Future	281.84	130.64	71.85	58.79	0.00	0.00	0.00

The current groundwater storage deficits and reduction in baseflow resulting from water use solely at the Naco BPS are unlikely to be affecting the baseflow hydrology of the San Pedro River. The Arizona Water Company, which serves the Naco BPS, withdraws groundwater from a location near Bisbee. The effects of water pumped from the Arizona Water Company's Bisbee production well area are unlikely to manifest in the San Pedro River in any foreseeable timeframe. Pumping from the Bisbee area results in less than 10% of capture of either inflow or outflow at 10 and 50-year timelines (Leake *et al.* 2008). Lastly, the current water demand at the Naco BPS, however, is only 2.28 AFA which, even if left entirely unmitigated, results in an immeasurably small baseflow impact over any reasonable time scale. The anticipated future increase in the Naco BPS water demand to 2.46 AFA, if also left unmitigated, would be similarly minute.

The greatest magnitude of groundwater effects from the Naco BPS, at both its current and future staff levels, result from the presence of personnel, families, and the induced local population (238.31 AFA at present, 261.45 AFA in the future), not the facility itself (see table 1-1 in the BA). Most of this (69%) (see Table 26 in the WCMR) human population currently resides, and is anticipated to continue to reside, in incorporated areas, which are presumed to be primarily the City of Sierra Vista, the most populous municipality in the SVS. The effects of groundwater use by the City of Sierra Vista may be

contributing to degradation of the middle to lower reaches of the San Pedro River as well as the Babocomari River (Schwartzman 1990, Leake *et al.* 2008). While Thomas and Pool (2006) found that "...year-round pumping from wells in the regional aquifer away from the river was not a major factor in the decrease in low flows.", their analyses were of the longest-term gaging site near Charleston, not the gage near Tombstone, which would reflect flow losses in the lower reaches of the river within the SVS.

Your proposed conservation easement acquisition, most likely from the Brophy Ranch along the affected reach of the Babocomari River, is anticipated to be effective in mitigating this portion of the total water use associated with the Naco BPS. The Naco BPS-related residents of the City of Sierra Vista benefit from the municipality's water conservation and recharge measures, though they are also residing in an area within which ground water withdrawals will have the most immediate effects to area streams (Leake *et al.* 2008).

We cannot definitively determine the exact locations of the 31% of personnel, families, and the induced local population that reside in unincorporated areas within the SVS (see Table 26 in the WCMR). Given that these residents represent less than one-third of the current impact of only 0.03 CFS (and, with mitigation, no future impact), we have determined that their total contributions to baseflow impacts are and will become increasingly hydrologically insignificant over time. We recognize that there is a time delay in terms of when current impacts and future mitigation of those impacts may reach the San Pedro River. This uncertainty, however, is unlikely to equate with any reasonable expectation that the proposed action will have any adverse effects to the San Pedro River.

First, we reiterate that current impacts are anticipated to be only 0.03 CFS, a value that is small in magnitude and which may approach the variability that exists in the hydraulic control which determines the accuracy of the stream gages that would be used to measure baseflows. Ninety-five percent of the published discharge values for the three stream gages within the upper San Pedro River, near Palominas, Charleston, and Tombstone are within 10 to 15 percent of the actual values (USGS 2010).

Additionally, the estimated magnitude of the impacts represents a worst-case scenario since it assumes that all baseflow is derived from the discharge of ground water from the regional aquifer, a situation that is known to be incorrect based on radioisotope and studies (Pool and Coes 1999, Baillie 2005, Wahi 2005). These studies suggest appreciable baseflow contributions from rainfall and overbank flood events; sources of water not considered in the calculations appearing in Table 1, above. We are also aware that a report revising the current understanding of upper San Pedro River Baseflows is currently in review by the United States Geological Survey. While in draft and therefore not citable, we anticipate that the report will: (1) effectively separate discharges into that portion derived from regional aquifer discharge (which represents the actual baseflow) from those resulting from direct runoff and/or the release of bank storage, itself a component of runoff (which is not baseflow); and (2) determine that actual baseflow varies seasonally.

Spring discharges in areas near the San Pedro are a component of baseflow. Trend data are generally lacking, though Pool and Coes (1999) noted no long-term increases or declines at Lewis Springs. Nevertheless, continued overdraft of the regional aquifer is anticipated to result in decreased spring discharges. We anticipate that the Naco BPS's total contribution to these eventual declines will be limited in magnitude based on the limited impacts identified in Table 1, above.

An additional potential hydrologic effect would be changes to surface flow patterns and peak flow hydrology, which are crucial for maintaining the dynamism of riparian ecosystems (Stromberg *et al.* 1991). The primary – and interrelated - mechanisms by which peak flow hydrology could be affected are: (1) the addition of appreciable amounts of new impervious area at the Naco BPS site, which could increase runoff; and (2) the construction of on-site detention basins to collect the increased runoff. Detention basins are typically a required engineering element of a development; the elevated peak flows could cause downstream erosion and flooding. Detention basins are a method by which the increased runoff can be collected, detained, and then allowed to infiltrate and/or be released over time. A detention basin, however, may only detain the volume of water resulting from increases in impervious area. A given site's baseline level of runoff is typically appropriate (subject to water law) and thus, may not be legally retained. These engineering and legal constraints ensure that, by design, the proposed action will not affect peak flow hydrology.

The following species-specific analyses will incorporate biological determinations based on the preceding hydrologic analyses.

Huachuca Water Umbel

We anticipate that implementation of the proposed action will have no direct effect to Huachuca water umbel; the species is not present on the project site. Our analysis primarily pertains to the potential indirect effects to plants occurring in the San Pedro River or its tributaries.

The most recent data collected indicate that there are 65 Huachuca water umbel metapopulations extant on the upper San Pedro River within the San Pedro Riparian National Conservation Area (San Pedro RNCA) (Vernadero Group 2009); 33.7 miles of the San Pedro RNCA is critical habitat for the species (FWS 1999). Other regional populations (i.e. Garden Canyon and sites in Mexico) are located upgradient from the Naco BPS and associated human population and thus would not be affected.

Huachuca water umbel is an aquatic or semi-aquatic, emergent plant, and is vulnerable to depletions in stream flow (FWS 1997). The primary constituent elements (PCEs) identified in the final rule (FWS 1999) as necessary for the survival and recovery of the Huachuca water umbel include, but are not limited to, the habitat components which provide: (1) sufficient perennial baseflows for growth and reproduction; (2) a stable stream channel subject to periodic floods that rejuvenate the riparian plant community; (3) a riparian plant community that is stable over time and in which non-native species either do not exist or have little or no adverse effect on umbel growth and reproduction; and (4) refugial sites that allow each population to survive catastrophic events and recolonize larger areas.

As discussed in the section entitled San Pedro River Hydrology, above, implementation of the proposed action, including measures to mitigate the effects of water use at the Naco BPS and by the facility's personnel, families, and the induced local population, is anticipated to result in immeasurably small effect on base or peak flow hydrology in the San Pedro River. The effects to Huachuca water umbel, including the PCEs of its critical habitat, are thus discountable (extremely unlikely to occur), and insignificant (unlikely to reach the scale where effects would be measurable). We thus concur that the proposed action is not likely to adversely affect the Huachuca water umbel and its critical habitat.

Chiricahua Leopard Frog

We anticipate that implementation of the proposed action will have no direct effect to Chiricahua leopard frogs; the species is not present on the project site. Our analysis primarily pertains to the potential indirect effects to frogs that will be translocated to sites within the San Pedro River or its tributaries.

Chiricahua leopard frogs currently exist in Brown, Miller, Carr, and Ramsey canyons; these individuals are upgradient from the pumping centers associated with the Naco BPS and its associated human population. Chiricahua leopard frogs are also anticipated to be translocated to various springs within the San Pedro RNCA (FWS 2008). With the exception of Murray Springs, the discharge of which is currently being augmented by effluent discharge from the Sierra Vista Environmental Operations Park, springs within the San Pedro RNCA derive all or part their discharges from the regional aquifer. As discussed in the San Pedro River Hydrology section, above, we have determined that the Naco BPS's current impacts to the San Pedro River are insignificant and discountable, and that future impacts will be reduced to zero by mitigation measures. We anticipate that the proposed action's effects to springs, a subset of river baseflows, will be similarly minute. Critical habitat has not been designated for this species; therefore, none will be affected. We concur that the proposed action is not likely to adversely affect the Chiricahua leopard frog.

Southwestern Willow Flycatcher

The only potential effects analyzed herein are indirect; the species does not occur on the project site.

Southwestern willow flycatchers occur in large numbers in downstream reaches of the San Pedro River. The Middle Gila/San Pedro Critical Habitat Unit critical habitat encompasses the San Pedro River from a point 3.5 miles upstream from the Hot Springs Canyon Confluence to the Gila River confluence, and includes the middle Gila River from the confluence to the Ashurst-Hayden Diversion Dam. The lowermost reaches of the river exhibit all of the PCEs of southwestern willow flycatcher critical habitat in at least some locations, including the presence of riparian plant species in a dynamic riverine environment; a specific, suitable structure of this vegetation; and the presence of insect populations for food.

Southwestern willow flycatchers have been documented sporadically on the upper San Pedro River over the last 10 years. Jack Whetstone, a BLM wildlife biologist, detected southwestern willow flycatchers while conducting weekly surveys at the Monitoring Avian Productivity and Survivorship (MAPS) bird banding station near Kingfisher pond both in August 2000 and 2001 (Whetstone pers. comm. 2000 and 2001 as cited in Environment and Natural Resources Division 2007). EEC, a biological consultant for Fort Huachuca, detected three migrant southwestern willow flycatchers in 2002, and two migrants were detected in 2003 and 2004. One breeding pair was detected during the third survey period in 2005. The nest was located south of the then-unusable Hereford Road Bridge on the west bank of the river. EEC monitored the nest from July 8 to August 3, 2005. Two eggs were originally observed; however, nest failure was determined on August 3, 2005, possibly due to heavy river flows and elevated stages that caused vegetation damage. More recently, a southwestern willow flycatcher exhibiting a brood patch – a condition associated with breeding – was captured at a Monitoring Avian Productivity and Survivorship (MAPS) survey site near Kingfisher Pond (also known as Young-Block Pond) (H. Swanson, pers. comm. 2008). An unsubstantiated report of a southwestern willow flycatcher at

Kingfisher Pond was received in June 2010 (S. Sferra pers. comm.). It appears likely that the San Pedro RNCA supports occasional breeding activities, though the reproductive output of such birds has not yet been confirmed.

The section entitled San Pedro River Hydrology, above, contains a detailed analysis wherein we anticipate that implementation of the proposed action will not appreciably affect the baseflow or flood hydrology of the San Pedro River within the SVS. The upper and lower reaches of the San Pedro River are hydrologically connected (Haney and Lombard 2005), but it is estimated that only 18 percent (7,054 AFA) of the annual water volume that leaves the Sierra Vista Subwatershed flows all the way to the Winkelman Subwatershed (ADWR 1991). This amount includes flood flows; the volume of base flows would be much less due to the intermittency of such surface water. We do not anticipate that the proposed action will have any measurable effect to baseflows in the reaches of the lower San Pedro River occupied by southwestern willow flycatchers, nor will the PCEs of the species' critical habitat be affected. We concur that the proposed action is not likely to adversely affect the southwestern willow flycatcher and its critical habitat.

Desert Pupfish and Gila Topminnow

The only potential effects analyzed herein are indirect; neither species occurs on the project site. Our analysis primarily pertains to the action's potential indirect effects; these species are likely to be translocated to springs within the San Pedro RNCA (FWS 2008). As discussed in the San Pedro River Hydrology and Chiricahua Leopard Frog sections, above, we have determined that the Naco BPS's current impacts to the springs tributary to the San Pedro River are insignificant and discountable, and that future impacts will be reduced to zero by mitigation measures. We anticipate that the proposed action's effects to springs, a subset of river baseflows, will be similarly minute. Critical habitat has not been designated for these species; therefore, none will be affected. We concur that the proposed action is not likely to adversely affect the desert pupfish or Gila topminnow.

Closing Text and Effects of Border Patrol Operations on Threatened and Endangered Species

Thank you for your continued coordination. No further section 7 consultation is required for the proposed project at this time. We remain, however, concerned with the effects of operations conducted by the portion of the current 417 (and future 450) personnel assigned to field activities. Operations that may adversely affect listed species include those that would result in eliminating vegetation, altering natural water flow, reducing water absorption and infiltration, impacting aquifer recharge capacity, impacting wetlands or uplands with petroleum products or other pollutants, and/or increasing siltation within perennial and seasonal streams or washes. A variety of CBP activities are of potential concern to protection of listed fish, amphibians, plants, and other aquatic organisms in the Naco BPS Area of Operations (AO). Some of these CBP activities include: road dragging, enlarging/upgrading existing roads or two-tracks, new roads initiated through off-road activities, increased vehicle speeds resulting from upgrading roadways, vegetation clearing, and helicopter and unmanned aerial vehicle (UAV) flights. Some of the possible disturbances to listed species from these CBP activities could include soil disturbance, vegetation disturbance, noise disturbance, light disturbance, chemical application, collisions, air quality disturbance, water quality disturbance, increased vehicle traffic, and increased pedestrian traffic. Vehicle use, especially off of established roads, but also dragging of roads increases the potential for soil particles to become airborne during dry periods (affecting air quality, vegetation transpiration, and pollination) and increasing siltation of streams and other wetlands during precipitation

events (affecting oxygen availability, gill function, and reproduction of listed fish species). In the case of CBP Air and Marine operations, may cause noise disturbance and bird/bat strikes.

In regard to evaluating the effects of your activities, action agencies and the FWS are mandated to use the best scientific and commercial data available (section 7(c)(1), 50 CFR 402.14(d), 50 CFR 402.14(g)(8)). In concluding that adverse effects are likely occurring from CBP activities, we have depended upon the observations of FWS staff as well as studies and information from other areas and other surrogate species, as no specific quantitative studies have been conducted in the Naco BPS AO on the effects of CBP activities on listed species or critical habitats. However, in our best scientific judgment, we believe many studies on effects of sedimentation on fishes, and erosion and sedimentation analyses of road construction and maintenance are broadly applicable to CBP activities in the area and, combined with on-the-ground informal assessments of effects of your actions, constitute the best scientific and commercial data available, consistent with the ESA and its implementing regulations as cited above.

We recommend that you promptly initiate and complete programmatic section 7 consultation for your operational activities in the Naco BPS AO. Through section 7 consultation, we can exempt certain activities from section 9 prohibitions of take through an incidental take statement, provided that the take does not jeopardize the continued existence of the listed species and the activities do not adversely modify or destroy their critical habitats.

In the interim, before consultation is completed, we recommend you take action to ensure your activities have minimal effects to listed species and their habitats. Note also that section 7(d) of the ESA requires that after initiation of consultation, the Federal action agency shall not make any irreversible or irretrievable commitment of resources with respect to the agency action that has the effect of foreclosing the formulation of any reasonable and prudent alternative measures.

In summary we look forward to working with you to ensure that all CBP activities minimize the effects to listed species and are in compliance with the ESA. In all future correspondence on this project, please refer to consultation number 22410-2010-F-0421. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department. Should you require further assistance, or if you have any questions, please contact Jason Douglas at (520) 670-6150 (x226) or Sherry Barrett at (x223).

Sincerely,

/s/ Jim Rorabaugh for
Steven L. Spangle
Field Supervisor

Ms. Jennifer Haas

11

cc (hard copy):

Field Supervisor, Fish and Wildlife Service, Phoenix, Arizona (2)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, Arizona
Fish and Wildlife Service, Tucson, Arizona (Attn: Jason Douglas)

cc (electronic copy):

U.S Customs and Border Protection (Attn: Charles Parsons), Laguna Niguel, California
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, Arizona
Regional Supervisor, Arizona Game and Fish Department, Tucson, Arizona

Filename: U:\CBP Naco BPS and related projects\CBP Naco BPS NLAA.docx

Literature Cited

- Arizona Department of Water Resources (ADWR). 1991. Nov. Hydrographic survey report for the San Pedro River watershed. Volume 1: general assessment, in re the general adjudication of the Gila River system and source. Phoenix, AZ: ADWR. Filed with the Court, November 20, 1991, 548 pgs.
- Baillie, M. N. 2005. Quantifying Baseflow Inputs to the San Pedro River: A Geochemical Approach, M.S. Thesis, Dept. Hydrology & Water Res., Univ. of Arizona, Tucson.
- Environment and Natural Resources Division. 2007. Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona. 330 pp with appendices.
- Haney, J.A. and J.L. Lombard. 2005. Interbasin groundwater flow at the Benson narrows, Arizona. *Southwest Hydrology* 4(2):8-9.
- Leake S.S., D.R. Pool. and J.M. Leenhouts. 2008. Simulated Effects of Ground-Water Withdrawals and Artificial Recharge on Discharge to Streams, Springs, and Riparian Vegetation in the Sierra Vista Subwatershed of the Upper San Pedro Basin, Southeastern Arizona. Scientific Investigations Report 2008-5207. 14 pp.
- Pool, D. R. and A. L. Coes. 1999. Hydro-geologic Investigations of the Sierra Vista Subwatershed of the Upper San Pedro Basin, Cochise County, Southeast Arizona, US Geological Survey Water-Resources Investigations Report 99-4197.
- Schwartzman, P.N. 1990. A hydrogeologic resource assessment of the lower Babocomari watershed, Arizona. Master's Thesis, Department of Hydrology and Water Resources, University of Arizona, Tucson, AZ.
- Sferra, S. 2010. Personal communication between S. Sferra, U.S. Fish and Wildlife Service and J. Douglas, U.S. Fish and Wildlife Service regarding the sighting of a southwestern willow flycatcher at Green Kingfisher Pond in the San Pedro Riparian National Conservation Area.
- Stromberg, J.C., Patten, D.T., and Richter, B.D. 1991. Flood flows and dynamics of Sonoran riparian forests. *Rivers* 2:221-235.
- Stromberg, J.C., R. Tiller, and B. Richter. 1996. Effects of ground water decline on riparian vegetation of semiarid regions: the San Pedro River, Arizona. *Ecological Applications* 6(1):113-131.
- Swanson, H. 2008. Personal communication between H. Swanson, Bureau of Land Management, and J. Douglas, U.S. Fish and Wildlife Service regarding the capture of a southwestern willow flycatcher in breeding condition at Green Kingfisher Pond in the San Pedro Riparian National Conservation Area.
- Thomas, B. and D.R. Pool. 2006. Trends in Streamflow of the San Pedro River, Southeastern Arizona, and Regional Trends in Precipitation and Streamflow in Southeastern Arizona and Southwestern New Mexico, U.S. Geol. Survey Prof. Paper 1712, 79 pp.

- U.S. Fish and Wildlife Service (FWS). 2008. Biological Opinion on Aquatic Species Conservation at the San Pedro Riparian and Las Cienegas National Conservation Areas, Arizona. 54 pp.
- U.S. Fish and Wildlife Service (FWS). 1999b. Endangered and threatened wildlife plants; Designation of Critical Habitat for Huachuca Water Umbel. A plant. Final rule. 50 CFR Part 17. July 12, 1999. Federal Register 64 (132); 37441-37453.
- U.S. Fish and Wildlife Service (FWS). 1997a. Endangered and threatened wildlife and plants; determination of endangered status for three wetland species found in southern Arizona and Northern Sonora, Mexico. Federal Register 62(3):665-689.
- U.S. Fish and Wildlife Service (FWS). 1995. Final rule determining endangered status for the southwestern willow flycatcher. Federal Register 60:10694-10715.
- U.S. Geological Survey. 2010. Water Resources of the United States – 2009 Annual Water Data Report for San Pedro River near Tombstone, Arizona. Website (<http://wdr.water.usgs.gov>) accessed June 25, 2010.
- Vernadero Group. 2009. 2009 Southwestern Willow Flycatcher (*Empidonax traillii extimus*) and Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*) Monitoring Report: San Pedro Riparian National Conservation Area and The Babocomari Cienega, Santa Cruz and Cochise Counties. Prepared for the Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona. 26 pp with appendices.
- Wahi, A.K. 2005. Quantifying Mountain System Recharge in the Upper San Pedro Basin, Arizona, Using Geochemical Tracers, M.S. Thesis, Dept. of Hydrology & Water Res., Univ. of Arizona, Tucson, 122 p.

OCT 9 2015



**U.S. Customs and
Border Protection**

Ms. Jean Calhoun
Assistant Field Supervisor
Tucson Office - Arizona Ecological Services
U.S. Fish and Wildlife Service
201 N. Bonita Avenue, Suite 141
Tucson, AZ 85745

Reference: Construction, Operation, and Maintenance of the Customs and Border Protection,
U.S. Border Patrol, Naco Station, Tucson Sector, Arizona
AESO/SE 22410-2010-I-0421

Dear Ms. Calhoun:

As part of the Endangered Species Act (ESA) Section 7 consultation for the construction, operation, and maintenance of the Naco Border Patrol Station (BPS) in Naco, Arizona (the Proposed Action), U.S. Customs and Border Protection (CBP) sought the U.S. Fish and Wildlife Service's (USFWS) concurrence that the Proposed Action may affect, but was not likely to adversely affect, various listed species. USFWS ultimately concurred with CBP's determination. Its concurrence was premised, in part, on CBP's commitment to implement, as a part of the Proposed Action, certain conservation and mitigation measures to offset the use of groundwater from the construction, operation, and maintenance of the Naco BPS. USFWS' concurrence is documented in a letter from the USFWS to CBP dated June 30, 2010, a copy of which is enclosed. I am writing to you about two of the conservation measures that were included in CBP's Proposed Action: (1) the establishment of off-site detention/infiltration basins; and (2) the acquisition of conservation easements to offset water use from the Proposed Action.

Water used by personnel at the Naco BPS, their families, and the induced population in the Sierra Vista Sub-watershed is drawn from groundwater within the Sierra Vista Sub-watershed. The nearby San Pedro River contains habitat for species listed as threatened and endangered under the ESA and these species rely on the same groundwater source for maintaining the health of their habitat. Groundwater pumping in the sub-watershed reduces the water available for recharge of the San Pedro River and constitutes a potential, indirect effect to listed species occurring in and near the San Pedro River.

During construction of the Naco BPS, CBP built detention basins on site that harvest rainwater for landscaping and other uses as a primary measure to offset groundwater use. The rainwater detention basins have been operational since 2011 and supply an average of approximately 35 acre-feet per year (AFY) of infiltration over the 40-acre Naco BPS site.

In addition to the detention basins, CBP determined that an effective way to offset the remaining water use is through the acquisition of a conservation easement to preclude future expansions in water use from development within the Sierra Vista Sub-watershed. CBP, working with both the U.S. Army Corps of Engineers (USACE) and the Trust for Public Land (TPL), is preparing to acquire an easement in the Sierra Vista Sub-watershed. The TPL has identified and secured an option on a 1912-acre property, currently known as the Flying H Ranch (see enclosure) (the Property). CBP believes the Property is well-suited to CBP's intended conservation objectives. To that end, TPL has begun all necessary real estate and environmental due diligence proceedings to allow TPL to exercise its option on the Property and, in turn, sell a conservation easement, which would cover the entire 1912-acre property, to CBP. A copy of the draft easement is enclosed. As you will see, the easement would restrict future water use, thus mitigating water use associated with the construction, operation, and maintenance of the Naco BPS.

CBP has determined that the 1912-acre conservation easement on the Property would provide 210.60 AFY of water savings. The calculations are described and shown in detail below. Based on the zoning (RU-4), which offers a maximum effective potential housing density of 3 acres per residence, setting aside the 1912-acre property for conservation equates to precluding development of 637.3 residences.

$$1912 \text{ acres} / 3 \text{ acres per residence} = 637.3 \text{ residences}$$

A single family residence is occupied by an average of 2.5 people; average per-person water use is 118 gallons per day. This yields a water consumption estimate of 107,675 gallons per residence per year.

$$2.5 \text{ persons per residence} \times 118 \text{ gallons per person per day} \times 365 \text{ days per year} = 107,675 \text{ gallons per residence per year}$$

Therefore, precluding the development of 637.3 residences saves the use of 68,624,866.67 gallons of water per year.

$$637.3 \text{ residences} \times 107,675 \text{ gallons per residence per year} = 68,624,866.67 \text{ gallons per year}$$

Using a conversion rate of 325,851 gallons per acre-foot, this is equal to 210.60 AFY.

$$68,624,866.67 \text{ gallons per year} / 325,851 \text{ gallons per acre-foot} = 210.60 \text{ acre-feet per year}$$

A water savings of 210.60 AFY is sufficient to offset the 130.46 AFY that CBP calculated as the amount of water use resulting from the Naco BPS in the *2010 Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Sub-watershed of the San Pedro Watershed*. Furthermore, the water savings from the conservation easement on the Property would also be sufficient to offset water use at two other CBP facilities within the Sierra Vista Sub-watershed: the Office of Air and Marine facility at the Libby Army Airfield on Fort Huachuca (16.98 AFY) and the Office of Field Operations facility at the Naco Land Port of Entry (16.04 AFY). The total water use for all CBP facilities in the Sierra Vista Sub-watershed is 163.48 acre-feet.

$$130.46 \text{ AFY} + 16.98 \text{ AFY} + 16.04 \text{ AFY} = 163.48 \text{ AFY}$$

Ms. Jean Calhoun
Page 3

Given the estimated 210.60 AFY provided by the conservation easement, the conservation easement would provide a water savings credit of 47.12 AFY that would be applied toward any potential future needs for mitigation. Should additional construction or increases in staffing level be proposed, CBP will consult with USFWS and determine if additional mitigation is necessary.

$$210.60 \text{ AFY} - 163.48 \text{ AFY} = 47.12 \text{ AFY}$$

CBP respectfully requests that USFWS review the draft easement and the above calculations and provide concurrence that the water savings from the proposed conservation easement on the Property satisfies the mitigation requirement for the construction, operation, and maintenance of the Naco BPS and provides mitigation credits as described. CBP would like to move forward with this acquisition as quickly as possible. Therefore, CBP requests a reply from USFWS within 30 days of receipt of this letter. No response from USFWS within the specified time frame will be considered concurrence and CBP will proceed with the transaction. If you have questions, please contact Mr. John Petrilla at (949) 643-6385, or john.petrilla@dhs.gov. Thank you.

Sincerely,



Paul Enriquez
Environmental Branch Chief
Real Estate and Environmental Services Division
Border Patrol Facilities and Tactical Infrastructure
Program Management Office

Enclosures



United States Department of the Interior



Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
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Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:
AESO/SE
02EAAZ00-2014-I-0613
22410-2010-I-0421

October 30, 2015

Mr. Paul Enriquez
Environmental Branch Chief
Real Estate and Environmental Services Division
Border Patrol Facilities and Tactical Infrastructure
Program Management Office
U.S. Customs and Border Protection
1300 Pennsylvania Avenue NW
Washington, DC 20229

Dear Mr. Enriquez:

This letter is in response to your October 9, 2015, request for written concurrence from the U.S. Fish and Wildlife Service (FWS) regarding the water-saving credits for your agency's acquisition of a conservation easement on the Flying H Ranch in Cochise County, Arizona. Specifically, you have requested that we concur with your calculations indicating that the acquisition would result in a water savings of 210.60 acre-feet per year (AFY). This letter also provides verification regarding the implementation of water use-related conservation measures for the construction, operation, and maintenance of the Naco Border Patrol Station (BPS), the subject of our June 30, 2010, letter of concurrence (File number 22410-2010-I-0421) and for the Office of Air and Marine Facility at Libby Army Airfield on Fort Huachuca, the subject of our July 14, 2015, letter of concurrence (File number 02EAAZ00-2014-I-0613). This correspondence is provided in accordance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*).

Your October 9, 2015, letter included calculations based on the housing density permitted by the Flying H Ranch property's zoning and the water used by the hypothetical persons per residence to determine the amount of water use that would be precluded by encumbering the property with a conservation easement that prevents such residential development.

Mr. Paul Enriquez

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We have verified your results using the same assumptions but differing in the mathematical method by which they were calculated. The verification is as follows:

1,912 acres zoned for one residence per 3-acre parcel = 637.3 residences

2.5 persons per residence × 637.3 residences × 118 gallons per capita per day = 188,003.5 gallons per day (GPD)

188,003.5 GPD × 0.00112 (the conversion factor from GPD to AFY) = 210.6 AFY

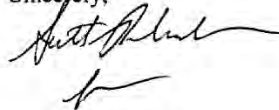
Your October 9, 2015, correspondence also indicates that the Naco BPS site design incorporated rainwater-harvesting detention basins to improve recharge and offset water use for landscaping. Your October 9, 2015, letter as well as your February 2010 *Water Conservation Management Report for U.S. Customs and Border Protection Activities within the Sierra Vista Subwatershed of the Upper San Pedro Watershed* (Water Conservation Report; Page 40 and Appendix F) estimated that approximately 35 AFY of infiltration was occurring at the Station.

The total identified water conservation measures (recharge and foregone development) are therefore 245.6 AFY, which is sufficient to fully mitigate the 163.48 AFY of water use at the Naco BPS (130.46 AFY), Libby Army Airfield (16.98 AFY), and the current use of the Office of Field Operations Facility at the Naco Land Port of Entry (16.04 AFY). Additionally, a credit of 82.12 AFY remains for future water mitigation needs.

We look forward to continued cooperation with U.S. Customs and Border Protection on reducing water use in the Upper San Pedro River Basin and the conservation and recovery of listed species.

If we can be of further assistance in this matter, please contact Jason Douglas (520) 670-6150 (x226) or Jean Calhoun (520) 670-6150 (x223).

Sincerely,



Steven L. Spangle
Field Supervisor

cc (hard copy):

Field Supervisor, Fish and Wildlife Service, Phoenix, Arizona (2 copies)
Jean Calhoun, Assistant Field Supervisor, Fish and Wildlife Service, Tucson, Arizona

cc (electronic copy):

Paul A. Martin, Environmental Planning Specialist, U.S. Customs and Border Protection,
Washington, District of Columbia

Mr. Paul Enriquez

3

cc (electronic copy - continued):

John Petrilla, Environmental Protection Specialist, U.S. Customs and Border Protection,
Laguna Niguel, California

Dawn Rohr, Conservation Branch Chief, Environmental and Natural Resource Division,
Fort Huachuca, Arizona

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, Arizona
(pep@azgfd.gov)

Raul Vega, Regional Supervisor, Arizona Game and Fish Department, Tucson, Arizona

U:\ACBP NACO BPS AND RELATED PROJECTS\CBP FLYING H RANCH CONSERVATION EASEMENT WATER CREDIT LETTER.DOCX

RECORDING REQUESTED BY AND)
WHEN RECORDED RETURN TO:)
)
U.S. Army Corps of Engineers)
1325 J Street)
Sacramento, California 95814)
Attn: Ryan Taylor)

74300149

EXEMPT FROM AFFIDAVIT
REQUIRED PURSUANT TO
A.R.S. §11-1134A.2. (for CE)

DEED OF PERPETUAL CONSERVATION EASEMENT
(Flying H Ranch)

THIS DEED OF CONSERVATION EASEMENT (hereinafter referred to as the "Easement" or "Conservation Easement") is made this 8th day of March, 2016, by and between THE TRUST FOR PUBLIC LAND, a California nonprofit public benefit corporation authorized to do business in Arizona as TPL-Arizona, Inc., whose address is 607 Cerrillos Road, Suite F-1, Santa Fe, New Mexico 87505 (hereinafter referred to as the "Grantor"), in favor of the UNITED STATES DEPARTMENT OF HOMELAND SECURITY, U.S. CUSTOMS AND BORDER PROTECTION, whose address is 1331 Pennsylvania Ave. NW, Washington, DC 20229, (hereinafter referred to as the "Grantee").

Exhibits to this Deed of Conservation Easement consist of the following:
Exhibit A – Legal Description of the Property
Exhibit B – Map of the Property
Exhibit C – Easement Documentation Report, dated February 26, 2016

RECITALS

A. The Grantor is the fee simple owner of the real property consisting of 1,912 acres, more or less, in Cochise County, Arizona, and more particularly described and shown in Exhibit A and Exhibit B, respectively, which are attached hereto and incorporated by this reference (the "Property").

B. The Grantee, acting through the Secretary of Homeland Security and the U.S. Customs and Border Protection desires to purchase certain interest in real property to protect resources associated with the Property, and is qualified as a "holder" of a conservation easement under the terms of Section 33-271 of the Arizona Revised Statutes.

RECORDING REQUESTED BY AND)
WHEN RECORDED RETURN TO:)
U.S. Army Corps of Engineers)
1325 J Street)
Sacramento, California 95814)
Attn: Ryan Taylor)

--- Digitally Recorded ---	
ID	2016-0199
County	Cochise
Date/Time	3/15/16 3:42 pm
www.recordingexpress.com	

74300149

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B. The Grantee, acting through the Secretary of Homeland Security and the U.S. Customs and Border Protection desires to purchase certain interest in real property to protect resources associated with the Property, and is qualified as a "holder" of a conservation easement under the terms of Section 33-271 of the Arizona Revised Statutes.

C. The Property contains substantial natural and open space values and attributes (hereinafter called “**Conservation Values**”) of great importance to the Grantor and the Grantee, and their protection will yield a significant public benefit; therefore, this Conservation Easement is created for the purpose of protecting the Conservation Values of the Property. The Property’s specific Conservation Values includes (i) protection of water supplies for the San Pedro River within the Sierra Vista Subwatershed of the river, which, in turn, preserve and protect the animal and plant species, including certain threatened or endangered species, that depend on the San Pedro River’s riparian environment, to be achieved by prevention of development (and associated water uses) of the Property, (ii) preservation of open space in an area of natural scenic beauty, including lands adjacent to State Highway 92, (iii) preservation of wildlife habitat for birds, mammals, reptiles, amphibians and invertebrates and (iv) protection of grassland habitat or potential grassland habitat (including the ability to restore and improve such grasslands.) These Conservation Values shall not be interpreted to prevent the removal of woody shrub and brush by Grantor, and restoration of grasslands by Grantor.

D. Grantor desires that the Conservation Values of the Property be preserved and protected in perpetuity.

E. Grantor intends to convey to Grantee, the right to preserve and protect the Conservation Values of the Property in perpetuity consistent with the terms of this agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants, terms, conditions, and restrictions contained herein, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, Grantor hereby grants and conveys to the Grantee, its successors and assigns, a perpetual conservation easement consisting of the rights and restrictions enumerated herein, over and across the Property. Grantor expressly stipulates that the Easement runs with the land and that the Easement shall be binding upon Grantor’s representatives, heirs, successors, and assigns.

- 1) **Purpose.** It is the purpose of the Easement to ensure that the Property will be retained predominantly in its substantially undisturbed and natural state, to preserve and protect in perpetuity the Conservation Values (as defined in Recital C herein) of the Property, and to prevent any use of the Property that will impair or interfere with those Conservation Values. In achieving these purposes, it is the intent of the Grantor and Grantee that the Easement permit the continuation of ranching and agricultural uses of the Property as may be conducted consistent with the Conservation Values protected herein. Grantor further intends to prevent any use of the Property that would significantly impair or interfere with the Conservation Values of the Property.

- 2) **Easement Documentation Report.** In order to establish the present condition of the Property, so as to properly monitor future uses of the Property and assure compliance with the terms hereof, an inventory of the Property's relevant resources, features, and conditions has been prepared (the "**Easement Documentation Report**" or "**Report**"). The parties acknowledge that the Report is intended to document the condition of the Property subject to the Easement as of the date written above and that both Grantor and Grantee have acknowledged in a signed statement that the Easement Documentation Report accurately represents the condition of the Property at the time of conveyance. A copy of the Report is attached hereto as **Exhibit C**, and copies of the Report (which include color versions of maps and photos) have been provided to both Grantor and Grantee. In the event a controversy arises with respect to the nature and/or extent of the historical and/or present use of the Property or the physical condition of the Property as of the date of the signing of this Conservation Easement, the parties shall not be foreclosed from utilizing all relevant or material documents, surveys, reports, and other evidence to assist in the resolution of the controversy.
- 3) **Rights of Grantee.** To accomplish the purpose of this Conservation Easement, the following rights are conveyed to Grantee.
- (a) The right to preserve and protect the Conservation Values of the Property consistent with the reserved rights of Grantor.
 - (b) The right to enter upon the Property at reasonable times in order to monitor Grantor's compliance with and otherwise enforce the terms of this Easement provided that such entry shall not unreasonably disturb Grantor's use and quiet enjoyment of the Property and provided that there be reasonable notice of entry sufficient to allow Grantor to be present and further provided, however, that Grantee shall have the right of immediate entry to the Property if, in its sole judgement, such entry is necessary to prevent damage to or the destruction of any of the Conservation Values protected by this Easement in accordance with Section 7(d) herein. The rights of entry for monitoring shall also extend to the Conservation Monitor, if any.
 - (c) To prevent any activity on or use of the Property that is inconsistent with the purpose of this Easement; and to require the rehabilitation of such areas or features of the Property that may be damaged by Grantor's activity or use (except for uses specifically allowed in this Easement) which are contrary to the purpose of this Easement or expressly prohibited under Section 5 herein.
 - (d) To use a qualified third party to perform any of Grantee's rights to monitor the compliance by the Grantor with the terms of this Easement (the "**Conservation Monitor**"). The selection of a Conservation Monitor, if any, shall be made by Grantee with concurrence of Grantor, provided, however, that the selection of either the Arizona Land and Water Trust (or its successors) or USDA Natural Resource Conservation Service shall not require further concurrence by Grantor.

Any costs associated with the use of a Conservation Monitor shall be the responsibility of the Grantee.

4. Reserved Rights. Grantor reserves for itself and its personal representatives, heirs, successors, and assigns, all rights accruing from ownership of the Property, including the right to engage or permit or invite others to engage in all uses and activities on the Property that are not expressly prohibited herein and are not inconsistent with the purpose of the Conservation Easement or the express terms and conditions set forth herein. Without limiting the generality of the permitted uses and activities, the following uses and activities are expressly permitted:

- (a) To carry on ranching and educational operations on the entire property.
- (b) To maintain, repair and construct the necessary agricultural improvements as reasonably necessary to facilitate the livestock grazing operations, including range livestock water, which shall be usage limited to livestock stock tanks, wildlife guzzlers and similar features with low water demand requirements.
- (c) To engage in and permit others to engage in recreational uses of the Property that do not substantially impact the Conservation Values of the Property. As described in Section 8 herein, this shall not be interpreted to give any right of public access to the Property unless approved by Grantor.
- (d) To collect dead and down firewood.
- (e) To construct, maintain and repair such utilities and agricultural outbuildings as are necessary in connection with the future uses of the Property permitted herein and provided such structures are not used *de facto* for residential purposes or other purposes prohibited by this Easement.
- (f) To build, maintain and repair fences; any new or reconstructed barbed wire fences shall be consistent with any wildlife compatible fencing guidelines published by the Arizona Game and Fish Department.
- (g) To construct, maintain and repair necessary trails and vehicleways.
- (h) To construct, maintain and repair stock tanks, pipelines, dikes, berms, gabions, and similar livestock watering or erosion control structures.
- (i) To manage vegetation to obtain increased forage production, increased perennial grass cover and reduced soil erosion. Vegetation management operations include but are not limited to range seeding, mechanical and chemical brush control and prescribed fire.
- (j) To restore native plant communities on the Property.

- (k) To use biocides and fertilizers for agricultural purposes, revegetation and control of noxious weeds and insect pests subject to following label recommendations, local, state and federal agency regulations for application, and generally accepted principles of safe and efficient use at the time of application.
- (l) Hunting by Grantor or permittees of Grantor provided that any hunting is consistent with the hunting regulations of the State of Arizona.
- (m) The grazing and pasturing of livestock in accordance with current generally accepted practices of range management.
- (n) The right, but not the obligation, to remove any of the structures, debris or other manmade materials that existed on the Property prior to the effective date of this Easement.

5. Prohibited Uses. Any activity on or use of the Property inconsistent with the purpose of this Easement is prohibited. Without limiting the generality of the foregoing, Grantor is expressly prohibited from carrying out the following activities and uses but Grantor shall have no responsibility for such activities carried out by third persons or governmental agencies over which Grantor has no control.

- (a) Construction or placing of any buildings, permanent camping accommodations, power lines, mobile homes or billboards except construction of agricultural or ranching outbuildings as provided in Section 4 herein. Grantor shall be permitted to maintain, repair, replace or extend power lines as may be needed to provide electricity to water wells for the agricultural uses that are permitted herein.
- (b) Confinement livestock feeding in which animals are permanently located in enclosures and the majority of their feed supplied from outside sources. This includes but is not limited to cattle feeding, dairy, hog, ostrich and emu farm operations. This paragraph shall not be construed to prevent the temporary or supplemental feeding of livestock.
- (c) Irrigation of pasture or other crops by groundwater pumping.
- (d) Commercial or industrial uses except for ranching and ecotourism operations.
- (e) Surface alternation or natural vegetation alteration other than that necessary or helpful to accommodate the uses of the Property authorized herein including the restoration of grasslands and erosion abatement.
- (f) The legal or de facto subdivision of the Property for any purpose. Grantor shall not transfer title to the Property except in its current entire configuration, even if the

Property is comprised of separate legal parcels. Notwithstanding the foregoing, however, Grantor may divide the Property into no more than two separate parcels (the "Divided Parcels"), each of which may be under separate ownership and operated as an independent unit, provided that each Divided Parcel shall remain subject to all the terms of this Easement. Any further right of legal or defacto division of the overall Property shall be extinguished, it being the intent of Grantor and Grantee that the Property shall not be separated into more than a maximum of two (2) parcels.

- (g) Dumping or storage of refuse, or other unsightly, offensive or toxic materials including, without limitation, livestock carrion. Notwithstanding anything in this Easement to the contrary, this prohibition does not make the Grantee an owner of the Property, nor does it permit the Grantee to control any use of the Property by the Grantor which may result in the storage, dumping, or disposal of hazardous or toxic materials; provided, however, that the Grantee may bring an action to protect the conservation values of the Property as described in this easement. (This prohibition does not impose liability on the Grantee, nor shall the Grantee be construed as having liability as a "responsible party" under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or similar federal or state statutes.)
- (h) Any stocking of non-native fish or amphibians or other non-native organisms to or from catchments, tanks, springs or creeks.
- (i) Filling, excavating, dredging, mining, drilling, exploration or extraction of minerals, hydrocarbons, soils, sand, gravel, rock or other materials on or below the surface of the Property except as necessary in connection with such activities as may be useful in performing any of the activities permitted pursuant to Section 4 herein. Additionally Grantor shall not lease or transfer any rights to third parties for such uses.
- (j) Pumping of groundwater for other than on-site agricultural uses associated with livestock grazing on the Property as provided for herein or restoration of native vegetation.
- (k) Storage and use of biocides and chemical fertilizers, except for residential and agricultural purposes permitted herein.
- (l) Off road vehicle travel except as reasonably necessary to facilitate agricultural, ranching and related operations.

6. Prior Notice and Approval.

- (a) Grantor expressly agrees to abide by the constraints of the Conservation Easement, and the Grantee agrees to recognize and abide by permitted uses. Grantor agrees to notify the Grantee in writing before exercising any right reserved by Grantor if the exercise of that right may adversely impact the Conservation Values associated with the Property. When notice is required, the Grantor shall notify the Grantee in writing not less than forty-five days (45) prior to the date Grantor intends to begin the activity in question. The notice shall describe the nature, scope, design, location, timetable, and any other material aspect of the proposed activity in sufficient detail to permit Grantee to make an informed judgment as to its consistency with the purpose of the Conservation Easement.
- (b) Where Grantee's approval is required or is desired by Grantor, Grantee shall grant or withhold its approval in writing within forty-five (45) days of receipt of Grantor's written request for approval. Grantee's approval may be withheld only upon a reasonable determination by Grantee acting in good faith that the action as proposed would be inconsistent with the purposes of this Conservation Easement. If, in the opinion of the Grantee, it is possible that the proposed activity can be modified to be consistent with this Conservation Easement, the Grantee shall inform the Grantor of the manner in which the proposed activity may thereafter be conducted.

7. Grantee Remedies, Breach and Restoration. If a dispute arises between the parties concerning the consistency of any proposed use or activity with the purpose of this Conservation Easement, the parties shall meet together to discuss the dispute and attempt resolution. In the event that the Grantee and the Grantor cannot resolve any dispute hereunder, the provisions of this Easement are enforceable by the Grantee and its successors or permitted assigns, as follows:

- (a) Notice of Violation. If the Grantee determines that a violation of the terms of this Easement has occurred or is threatened, the Grantee shall give written notice to the Grantor of such violation and demand corrective action sufficient to cure the violation. If Grantor fails to cure the violation within thirty (30) days after receipt of notice thereof from the Grantee, or under circumstances where the violation cannot reasonably be cured within a 30 day period, fail to begin curing such violation within the 30 day period, or fail to continue diligently to cure such violation until finally cured, the Grantee may seek injunctive relief as set forth herein.
- (b) Injunctive Relief. Where irreparable harm may occur, the Grantee, in the sole reasonable judgment of the Grantee, may bring an action in equity in a court of competent jurisdiction to enforce the terms of this Easement, to enjoin the

violation, by temporary or permanent injunction, and to require the restoration of the Property to the condition that existed prior to any such injury.

- (c) Damages. Grantee shall be entitled to recover damages as awarded by a court of competent jurisdiction for violation of the terms of this Easement or injury to any Conservation Values protected by this Easement. Without limiting the Grantor's responsibility therefore, the Grantee may, in its reasonable discretion, apply any damages recovered to the cost of undertaking any corrective action on the Property.
- (d) Emergency Enforcement. If the Grantee in its sole reasonable discretion, determines that circumstances require immediate action to prevent or mitigate significant damage to the Conservation Values of the Property, the Grantee may pursue its remedies under this Section 7, without waiting for the period provided for cure to expire, and provided that Grantee has first given Grantor the written notice of the violation described in Section 7(a) herein.
- (e) Scope of Relief. The rights under this Section 7, apply equally in the event of either actual or threatened violations of the terms of this Easement. The parties agree that the Grantee's remedies at law for any violation of the terms of this Easement may be inadequate and that the parties shall be entitled to the injunctive relief described in Section 7(b), both prohibitive and mandatory, in addition to such other relief to which the Grantee may be entitled, including specific performance of the terms of this Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. The remedies described in this Section 7, shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity.
- (f) Costs of Enforcement. Any award of fees or costs to either party in any suit involving the enforcement of terms of this Easement shall be determined in accordance with applicable law. Any obligation of any agency of the United States of America assigned pursuant to this paragraph is subject to applicable federal law as well as authorization and availability of funds.
- (g) Forbearance. Forbearance by Grantee to exercise its rights under this Easement in the event of any breach of any term thereof shall not be deemed or construed to be a waiver of such term or of any subsequent breach of the same or any other term of this Easement or of any of Grantee's rights under this Easement. No delay or omission by Grantee in the exercise of any right or remedy upon any breach shall impair such right or remedy or be construed as a waiver.
- (h) Waiver of Certain Defenses. Grantor acknowledges that it has carefully reviewed the Easement. In full knowledge of the provisions of this Easement, Grantor hereby waives any claim or defenses it may have against Grantee or its successors

in interest under or pertaining to the Easement based upon waiver, laches, estoppel, adverse possession, or prescription.

- (i) Acts Beyond Grantor's Control. Nothing contained in this Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property resulting from causes beyond Grantor's control, including, without limitation, wildfire, flood, storm, and earth movement, or from any prudent action taken by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes.

8. Public Access. Grantor reserves the right to restrict or prohibit public or private access to the Property. This Easement is not intended to allow additional rights of Grantee to use the Property except for those rights specifically allowed under Section 3 herein or otherwise allowed by law.

9. Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is requested to give to the other shall be in writing and either served personally or sent by next business day mail service, registered or certified mail, return receipt requested, addressed as follows:

To Grantor:

The Trust for Public Land
101 Montgomery Street, Suite 900
San Francisco, CA 94104
Tel: (415) 800-5295
FAX: (415) 495-0541
Attn: Legal Dept.

To Grantee:

U.S Customs and Border Protection
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677
Attn: Paul Enriquez

Following a conveyance of the Property
from The Trust for Public Land to The
San Jose Ranch Inc.

The San Jose Ranch Inc.
P.O. Box 4012
2861 West Highway 92
Bisbee, AZ 85603
Attn: John W. Ladd
Tel: (520) 456-5938

Or to such other addresses as either party from time to time shall designate by written notice to the other.

10. Recordation. The Grantee shall record this instrument in timely fashion in the official records of Cochise County, Arizona and may re-record it at any time, as may be required, to preserve its rights in the Easement.

11. Liabilities, Indemnification and Costs.

- (a) **No Actions.** Grantor represents and warrants that to the best of Grantor's knowledge, there is no pending or threatened litigation affecting the Property or any portion thereof which will materially impair the Conservation Values of the Property or any portion thereof to the Grantee.
- (b) **Indemnification.** Grantor shall hold harmless, indemnify, and defend the Grantee and the Grantee's officers, employees, agents, and contractors and the heirs, personal representatives, successors, and assigns of each of them from and against all liabilities, penalties, costs, losses, damages, expenses, causes of action, claims, demands, or judgments, including, without limitation, reasonable attorney's fees, arising from or in any way connected with the presence or release of any hazardous material or substance of any kind on the Property. This paragraph shall not apply in the case of any hazardous material or substance in any manner placed on the Property by the Grantee or the Grantee's representatives or agents.
- (c) **Costs Incident of Ownership.** Grantor agrees to pay any and all real property taxes and assessments levied by competent authority on the Property and to bear all costs of operation, upkeep, and maintenance of the Property, and does hereby indemnify the Grantee therefore.

12. Change of Conditions. The fact that any use of the Property that is expressly prohibited by this Easement, or any other use as determined to be inconsistent with the purpose of this Easement, may become greatly more economically valuable than permitted uses, or that neighboring properties may in the future be put entirely to uses that are not permitted hereunder, has been considered by the Grantor in granting this Easement. It is Grantor's belief that any such changes will increase the benefit to the public of the continuation of this Easement, and it is the intent of both Grantor and Grantee that there are no changed circumstances justifying the termination or extinguishment of this Easement pursuant to this Section. In addition, the inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Easement or be considered grounds for its termination or extinguishment.

13. Amendment. If circumstances arise under which an amendment to or modification of the Easement would be appropriate, Grantor and Grantee may jointly amend the Easement. Any such amendment shall be consistent with the purposes of the Easement, shall not affect its perpetual duration, shall not permit additional development or improvements to be undertaken on the Property other than development or improvements currently permitted by the Easement, and shall not impair any of the Conservation Values

of the Property. Any such amendment shall be recorded in the official records of the county in which the Property is located.

14. Extinguishment. If circumstances arise in the future that render the purpose of this Easement impossible to accomplish, this Easement can only be terminated or extinguished, whether with respect to all or part of the Property, by judicial proceeding in a court of competent jurisdiction.

15. General Provisions.

- a. Controlling Law. The interpretation and performance of this Easement shall be governed by the laws of the United States of America and the State of Arizona, except that in the event of a conflict, the provisions of Federal law shall apply.
- b. Severability. If any provision of this Easement or the application thereof to any person or circumstance, is found to be invalid, the remainder of the provisions of this Easement shall not be affected thereby.
- c. Entire Agreement. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions negotiations, understandings, or agreements, relating to the Conservation Easement, all of which are merged into this Conservation Easement.
- d. No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.
- e. Grantor – Grantee. The terms "Grantor" and "Grantee" include respectively the above named Grantor, and its personal representatives, heirs, successors, and assigns, and the above named Grantee, its successors and assigns.
- f. Joint Obligation. The obligations imposed by this Easement upon the parties shall be joint and several.
- g. Successors. The covenants, terms, conditions, and restrictions of this Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Property.
- h. Assignment by Grantee. Grantee may assign its rights and responsibilities under this Conservation Easement to a federal or state agency, including but not limited to U.S. Bureau of Land Management, Cochise County or the Arizona Game and Fish Commission. Grantee may also assign its rights and responsibilities under this Conservation Easement to the Arizona Land and Water Trust (or its successors), however an assignment by Grantee to any other nonprofit organization may only be done with concurrence of Grantor.

- i. Assignment by Grantor. Immediately after conveying the Conservation Easement to the Grantee, the original Grantor, The Trust for Public Land, intends to convey all of its interest in the Property to The San Jose Ranch Inc. Accordingly, the contact information for The San Jose Ranch is in the Notice Section (Section 9) of this Conservation Easement, and upon such conveyance of the Property the Grantor shall solely be The San Jose Ranch Inc. and The Trust for Public Land shall have no further rights or responsibilities under this Conservation Easement. Future conveyances of the Property shall have similar effect whereby the successor owners of the Property in fee title shall be the Grantor under this Conservation Easement.
- j. Duration of Easement. The Easement created by this deed shall burden and run with the Property in perpetuity.
- k. Subsequent Liens On Property. No provision of this Easement should be construed as impairing the ability of Grantor to use the Property as collateral for subsequent borrowing, provided that any mortgage, deed of trust or lien arising from such a borrowing is at all times subordinated to this Easement.
- l. Captions. The captions have been inserted solely for convenience of reference and are not part of the Easement and shall have no effect upon construction or interpretation.
- m. Counterparts. The parties may execute this instrument in two or more counterparts, which shall, in the aggregate, be signed by all parties; each counterpart shall be deemed an original instrument as against any party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.


TO HAVE AND TO HOLD unto the Grantee, its successors, and assigns forever.

IN WITNESS WHEREOF Grantor and the Grantee have set their hands on the day and year first above written.

GRANTOR:
The Trust for Public Land, a California
 nonprofit public benefit corporation

Signed in Counterpart
 By: _____
 Gilman Miller, Senior Counsel
 Date: _____, 2016

GRANTEE:
 [U.S. Customs and Border Protection]

By: 
 Name: LOREN FLOSSMAN
 Title: DIRECTOR
 Date: 8 MAR 16

ACKNOWLEDGMENT

STATE OF Washington
COUNTY OF D. C.) ss

On this 8th day of March, 2016, before me
Guy F Tombonene, a Notary Public in and
for Washington County, State of District of Columbia, personally appeared
LOREN W FLOSSMAN, known or identified to me to be
the DIRECTOR for
CUSTOMS AND BORDER PROTECTION, that executed the within
instrument on behalf of said corporation, and acknowledged to me that such corporation
executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the
day and year in this certificate first written above.



Notary Public for the State of
[Signature]
Residing in
Washington, D.C.

My Commission Expires
February 14, 2017

My Commission Expires
02/14/2017

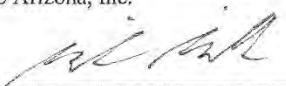
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IN WITNESS WHEREOF Grantor and the Grantee have set their hands on the day and year first above written.

GRANTOR:

The Trust for Public Land, a California nonprofit public benefit corporation authorized to do business in Arizona as TPL-Arizona, Inc.

By: 
 Gilman Miller, Senior Counsel
 Date: 3-8-16, 2016

GRANTEE:

[U.S. Customs and Border Protection]

By: Signed in Counterpart

Name: _____

Title: _____

Date: _____

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Francisco

On Mar 8, 2016 before me, H. Shih, Notary Public,

personally appeared Eilman Miller, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature H. Shih (Seal)



THIS NOTARY CERTIFICATE IS TO BE ATTACHED TO: Deed of Perpetual Conservation Easement (Flying H Ranch)

Date of Document: March 8, 2016 / Consisting of 48 pages
Parties to Document: 48
[The Trust for Public Land]
[United States Department of Homeland Security, U.S. Customs and Border Protection]

Exhibit A
Legal Description of the Property

PARCEL NO. 1:

ALL OF SECTION 33, TOWNSHIP 23 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ALL COAL AND OTHER MINERALS AS RESERVED IN THE PATENT TO THE LAND.

PARCEL NO. 2:

ALL OF SECTION 35, TOWNSHIP 23 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ALL COAL AND OTHER MINERALS AS RESERVED IN THE PATENT TO THE LAND.

PARCEL NO. 3:

THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 4;

AND THE SOUTHWEST QUARTER, THE NORTH HALF OF THE SOUTHEAST QUARTER,

AND THE NORTH HALF OF SECTION 5;

ALL IN TOWNSHIP 24 SOUTH, RANGE 23 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ANY PORTION THEREOF LYING WITHIN STATE HIGHWAY 92.

EXCEPT ANY PORTION OF SAID SECTION 5 LYING SOUTH OF THE NORTHERLY LINE THE SOUTHERN PACIFIC RAILROAD RIGHT OF WAY.

EXCEPT THAT PORTION CONVEYED TO THE ARIZONA HIGHWAY DEPARTMENT IN QUIT CLAIM DEED RECORDED AS DOCKET 267, PAGE 14.

EXCEPT ANY PORTION OF SAID SECTION 5 LYING WITHIN THE FOLLOWING DESCRIBED PARCEL OF LAND: .

A PORTION OF THE WEST HALF OF THE WEST HALF OF SECTION 5
AND THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF

SECTION 6 OF TOWNSHIP 24 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

COMMENCING AT A ONE-INCH BURIED PIN MONUMENT FOR THE NORTHWEST CORNER OF SAID SECTION 5;

THENCE SOUTH 00 DEGREES 09 MINUTES 54 SECONDS EAST, A DISTANCE OF 144.30 FEET ALONG THE LINE OF SAID SECTIONS TO A NON-TANGENT CURVE POINT ON THE SOUTHERLY HIGHWAY 92 RIGHT OF WAY AND THE POINT OF BEGINNING;

THENCE 618.40 FEET ALONG A RIGHT OF WAY CURVE TO THE RIGHT HAVING A DELTA ANGLE OF 03 DEGREES 22 MINUTES 30 SECONDS AND A RADIUS OF 10,500.00 FEET;

THENCE SOUTH 81 DEGREES 25 MINUTES 12 SECONDS EAST, A DISTANCE OF 46.97 FEET ALONG SAID RIGHT OF WAY;

THENCE SOUTH 00 DEGREES 09 MINUTES 54 SECONDS EAST, A DISTANCE OF 3017.32 FEET;

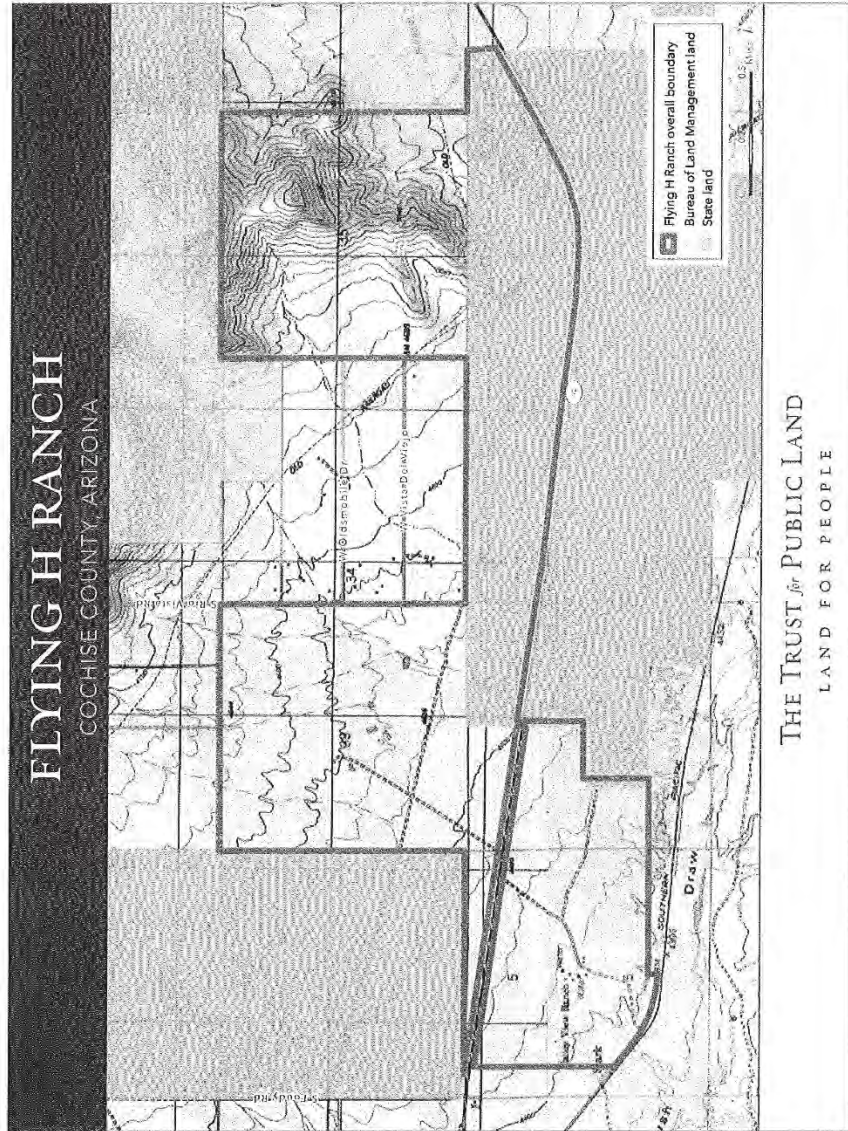
THENCE NORTH 50 DEGREES 53 MINUTES 03 SECONDS WEST, A DISTANCE OF 952.38 FEET ALONG THE NORTHERLY LINE OF RAILROAD;

THENCE NORTH 89 DEGREES 55 MINUTES 34 SECONDS EAST, A DISTANCE OF 77.20 FEET TO THE COMMON QUARTER CORNER OF SAID SECTIONS;

THENCE NORTH 00 DEGREES 09 MINUTES 54 SECONDS WEST, A DISTANCE OF 2497.54 FEET ALONG THE LINE OF SAID SECTIONS TO THE POINT OF BEGINNING.

AND EXCEPT AN UNDIVIDED 1/2 INTEREST IN AND TO ALL OIL AND GAS, AS RESERVED IN DEED RECORD IN BOOK 147 OF DEEDS, PAGE 143.

**Exhibit B
Map**



September 22, 2011

**Exhibit C
Easement Documentation Report**

**[Attached copy of Easement Documentation Report, which includes
acknowledgement page signed by Grantor and Grantee]**

**FLYING H RANCH
CONSERVATION EASMENT
BASELINE DOCUMENTATION REPORT**

**1,912 acres in the San Pedro River Watershed
Along State Highway 92 between
San Pedro River and City of Bisbee
Cochise County, Arizona**

**A Land and Water Protection Project of
U.S. Homeland Security/Customs and Border Protection and
The Trust for Public Land**

Condition of the Property as of February 26, 2016

Prepared by:

Michael Patrick
Arizona Program Manager
The Trust for Public Land
607 Cerrillos Road, Suite F-1
Santa Fe, NM 87505

Acknowledgement of Condition

This acknowledgement constitutes a part of a Conservation Easement Baseline Document Report prepared in conjunction with a Conservation Easement purchased on March 8th 2016 by U.S. Customs and Border Protection ("Grantee") from The Trust for Public Land ("Grantor"). The conservation easement covers a tract of land known as the Flying H Ranch located approximately nine miles southwest of City of Bisbee in Cochise County, Arizona.

The Conservation Easement Baseline Documentation Report entitled "Flying H Ranch Baseline Documentation Report", was prepared by The Trust for Public Land and includes a cover page, table of contents, maps, photographs, tables, exhibits, this Acknowledgement, and a description of the Protected Property, consisting of 1,912 acres, more or less, of private land. Grantor and Grantee acknowledge and agree that the Conservation Easement Baseline Documentation Report is an accurate representation of the Protected Property at the time of the transfer of the Conservation Easement. The Grantor anticipates selling the Property to The San Jose Ranch, Inc. and therefore has requested the acknowledgement of The San Jose Ranch, Inc. below as well.

GRANTEE:
U.S. Customs and Border Protection

By: [Signature]
Name: LOREN FLOSSMAN
Title: DIRECTOR
Date: 8 MAR 16

GRANTOR:
THE TRUST FOR PUBLIC LAND, a
California nonprofit public benefit corporation
authorized to do business in Arizona as TPL-
Arizona, Inc

Signed in Counterpart
By: _____
Name: _____
Title: _____
Date: _____

THE SAN JOSE RANCH, INC, an Arizona
corporation (as a future Grantor)

Signed in Counterpart
By: _____
Name: _____
Title: _____
Date: _____

Acknowledgement of Condition

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GRANTEE:
U.S. Customs and Border Protection

By: [Signature]
Name: LOREAN FLOSSMAN
Title: DIRECTOR
Date: 8 MAR 16

GRANTOR:
THE TRUST FOR PUBLIC LAND, a
California nonprofit public benefit corporation
authorized to do business in Arizona as TPL-
Arizona, Inc

By: [Signature]
Name: GOLDMAN MITCHELL
Title: Sr. Counsel
Date: 3-8-16

THE SAN JOSE RANCH, INC, an Arizona
corporation (as a future Grantor)

By: [Signature]
Name: JOHN W. LADD
Title: PRES
Date: 03-14-2016

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6. Photographs.....	12
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Exhibits:

- Exhibit A: Locator map of Protected Property (shows Sierra Vista subwatershed)
- Exhibit B: Locator map of Protected Property (includes Ladd Ranch)
- Exhibit C: Legal description of Protected Property
- Exhibit D-1: Map of Protected Property
- Exhibit D-2: Map of Protected Property with Photo Point Locations/Annotations
- Exhibit E: Photographs of Protected Property
- Exhibit F: Aerial Photograph of Protected Property
- Exhibit G: Detail of Structures in Old Ranch Headquarters Area

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- Exhibit G: Detail of Structures in Old Ranch Headquarters Area

CONSERVATION EASEMENT BASELINE DOCUMENTATION REPORT

1. INTRODUCTION

This Baseline Documentation Report has been prepared in conjunction with a conservation easement ("**Conservation Easement**") purchased on March 15th, 2016, by the U.S. Customs and Border Protection, an agency of the U.S. Department of Homeland Security ("**Grantee**"), from The Trust for Public Land ("**Grantor**"). The Conservation Easement covers approximately 1,912 acres of private land in Cochise County, Arizona, as legally described in attached Exhibit C and shown on the map attached as Exhibit D ("**Protected Property**"). The Protected Property is also referred to in this document as the "Flying H Ranch" or the "Property", and is referred to as the Property in the Conservation Easement. The Property consists of ten tax parcels per the records of Cochise County, and these parcels are listed in Section 7 herein. Exhibits A and B are location maps showing the general location of the Property.

The primary purpose for the purchase of the Conservation Easement is to mitigate for water use in this Sierra Vista sub-watershed of the San Pedro River watershed. By preventing future residential development and other uses of the Flying H Ranch requiring significant water consumption, this project will reduce associated water withdrawals from the groundwater of this subwatershed of the River and thereby benefit water supply to the San Pedro River.

This Baseline Document Report is intended to document the condition of the Protected Property as of the date of the Conservation Easement and provide a baseline of conditions of the Protected Property for use in annual monitoring to ensure compliance with the terms of the Conservation Easement.

The Grantor intends to sell the Flying H Ranch to The San Jose Ranch Inc., whose owners also own the adjacent ranch shown on Exhibit B as the Ladd Ranch; The San Jose Ranch Inc. plans to manage the Protected Property as part of the Ladd Ranch, which will likely include work to improve the grassland habitat and reduce the large amounts of woody shrub vegetation on the Flying H Ranch. Mr. Ladd, via The San Jose Ranch Inc., will therefore become Grantor under the Conservation Easement upon an assignment of the Property from The Trust for Public Land; in this role, John Ladd is referenced in this report to provide further clarification in this baseline report.

2. LOCATION

The Protected Property is located in Cochise County along State Highway 92 (between mile markers 345 and 349). The entrance to the old ranch headquarters for the Property is approximately 5-1/2 miles east of the San Pedro River and 9 miles southwest of the city of Bisbee. As shown on Exhibits B & D, the Property is bisected by State Highway 92 with runs west to east through the Property.

3. SITE DESCRIPTION

The Flying H Ranch Conservation Easement will protect approximately 1,912 acres in the Sierra Vista subwatershed within the larger watershed of the San Pedro River. The San Pedro River is considered to support some of the best riparian habitat remaining in the Sonoran Desert ecoregion. The river is a major migratory pathway for Neotropical migratory birds and supports the second largest nesting population of federally-listed southwestern willow flycatchers. The perennial and near perennial reaches of the river support extensive areas of cottonwood-willow riparian forest that are important migratory habitat for a diverse array of birds. Floodplain terraces adjacent to the river also support high-quality mesquite bosque woodland. The highest breeding bird densities in North America have been recorded in this combination of habitats. As described in this report, a major conservation benefit of this Flying H Ranch project is to reduce groundwater consumption associated with future development of the Property, thereby benefiting water supply for the San Pedro River.

The Property is located in the Sky Islands Region, a region named for forested mountain "islands" surrounded by desert and grassland plains, located at the convergence of the north-south span of temperate and subtropical forests and the east-west overlap of the Chihuahuan and Sonoran deserts, where intermingling of bioregional edges results in extraordinary biodiversity. The Sky Island Region extends from southeastern Arizona into southwestern New Mexico and the northern Mexican states of Sonora and Chihuahua. One of the Sky Island mountain ranges, the Mule Mountains is located approximately 9 miles northeast of the Property and another, the Huachuca Mountains (one of the most important of these mountains ranges from a bio-diversity perspective) is located 20 miles to the west.

The Flying H Ranch is located at the northern end of a large San Pedro Valley grassland area. The portion of this grassland area in Mexico covers over 500,000 acres and has been identified by The Nature Conservancy and other grassland experts as a priority grassland landscape for conservation and restoration. In the U.S. side, a significant portion of this grassland area has been fragmented by residential development (particularly associated with the growth of the nearby city of Sierra Vista) or experienced shrub conversion (e.g. loss of grassland to mesquite encroachment).

The Protected Property is described further below in three different areas of the Property (these areas are shown in Exhibit D-2):

Area A: This area is the portion of the Flying H Ranch that is located on the south side of Highway 92. The old ranch headquarters is located in this area, and there is a dirt ranch road in fair condition that runs from the state highway to the headquarters area. There are a number of old residential buildings, ranch outbuildings, corral and water tank within an area of approximately two acres, all currently in poor and uninhabitable condition. There is a water well (Well No. 55-603148) located here; since there is no electrical service at this time we were not able to determine if the well is in working condition. There is substantial amount of mesquite encroachment (40%+) in this area.

Area B: This area consists of Section 33 and some additional land that is south of Section 33 and north of State Highway 92. The only improvements in this area are a water well (Well No. 55-602968) and water storage tank (approximately 20' diameter and 10' tall). (There is also a capped water well, No. 55-218989, in this area.) An electric transmission line runs from the state highway to the existing water well. This area is accessed from Highway 92 either from an old ranch road currently in fair condition (entrance from highway is through gate just south of the water well) or from Rio Vista Road, which follows the eastern boundary of this area (i.e. follows the eastern boundary of Section 33). Along the northern boundary of this area runs Calle 5 Road, which then intersects with Ruby Dare Road at the northwest corner. There is an old gravel quarry located near the center of Section 33, from which gravel and rock was extracted in the 1960's for use when the state highway was built; this quarry site is difficult to see due to vegetative cover, but the sides (7-8; high) of the quarry are still visible. A large drainage runs across the property from the north to south on the eastern side of this area (sloping in the southerly direction, and draining into the state lease described below.) There is very little open grassland, with much vegetative cover consisting of mesquite, creosote, white thorn, desert broom and sage brush. Much of the private land to the immediate north and east of this area has been subdivided into 40 acre or smaller parcels, and quite a few of these parcels currently have residences on them.

Area C: This area is Section 35. It is located at the southern end of Naco Hills and therefore has much more topography (steep slopes, hills and ridgelines) than other parts of the ranch. There are no improvements on this area of the property. A ranch road runs up the hill from western boundary of Section 35 (entering this area from the eastern end of Vista Del Viejo Road). The top of this road offers big views of the Huachuca Mountains to the west and of City of Bisbee to the east. There is an old railroad grade crossing east-west across the southern part of this section. This Area C does not have as much shrub encroachment as Area A or B.

State Lease: There is also a grazing lease on approximately 687 acres of land owned by the Arizona State Land Department that has historically been associated with the Flying H Ranch (referred to as the Whelan Lease or Lease No. 5-97447, and shown on Exhibit D-2.) This state lease land runs just to the south of Sections 33 and 35 (i.e. Areas B and C). The Conservation Easement does not affect this land since it only pertains to the private land of the Flying H Ranch.

The Trust for Public Land intends to convey the Flying H Ranch and that associated grazing lease to The San Jose Ranch, Inc., a private company managed by John Ladd, to be managed as part of the large Ladd Ranch that is adjacent to Flying H Ranch to the south .

4. CONSERVATION VALUES OF THE PROTECTED PROPERTY

The Protected Property's specific Conservation Values are described in Recital C of the Conservation Easement, and restated below:

"The Property contains substantial natural and open space values and attributes (hereinafter called "Conservation Values") of great importance to the Grantor and the Grantee, and their protection will yield a significant public benefit; therefore, this Conservation Easement is created for the purpose of protecting the Conservation Values of the Property. The Property's specific Conservation Values includes (i) protection of water supplies for the San Pedro River within the Sierra Vista Subwatershed of the river, which, in turn, preserve and protect the animal and plant species, including certain threatened or endangered species, that depend on the San Pedro River's riparian environment, to be achieved by prevention of development (and associated water uses) of the Property, (ii) preservation of open space in an area of natural scenic beauty, including lands adjacent to State Highway 92, (iii) preservation of wildlife habitat for birds, mammals, reptiles, amphibians and invertebrates and (iv) protection of grassland habitat or potential grassland habitat (including the ability to restore and improve such grasslands). These Conservation Values shall not be interpreted to prevent the removal of woody shrub and brush by Grantor, and restoration of grasslands by Grantor."

Following is a further description of the importance of these Conservation Values:

Protection of water supplies for San Pedro River: The river bed of the San Pedro River intersects a shallow groundwater table in this region and the groundwater therefore contributes to flow of the river. Increasing groundwater consumption for residential, commercial, industrial, and irrigated agriculture water uses can reduce the quantity of water available for the River, thereby negatively impacting the unique riparian and aquatic ecosystems of the San Pedro River and imperiling the survival and recovery of federally listed species including Huachuca water umbel, lesser long-nose bat, Sonora tiger salamander, Chiricahua leopard frog, and Southwestern willow flycatcher, among others. A primary purpose of the conservation easement for the Flying H Ranch is to prevent future groundwater uses that would be associated with residential development of the Property, thereby benefitting water supply available for the San Pedro River. The conservation easement terms also prohibits other significant uses of the Property that would require significant groundwater consumption, such as irrigated crops.

Preservation of Open Space: The Flying H Ranch lies in a scenic stretch of land along State Highway 92, thereby providing open space benefits to the public. From the Property are views of the Huachuca Mountains to the west, Naco Hills to the northeast and the large grasslands to the south as these grasslands rise up to the San Jose Mountain located in Mexico. The prevention of residential development, commercial and industrial uses, billboards, and other property uses that would detract from open space benefits along this major state highway from the San Pedro River to the City of Bisbee is a significant benefit of this project.

Preservation of Wildlife Habitat: Fragmentation of wildlife habitat by residential development is one of the major stresses on wildlife in southeastern Arizona, particularly in areas like this that are experiencing significant population growth; such fragmentation and other negative wildlife impacts result from additional fencing, roads, power lines, traffic, and predation from cats and dogs, among other negative impacts. Protection of the Flying H Ranch as an intact ranch will prevent subdivision and fragmentation of a significant part of this landscape.

Protection of Grassland Habitat or Potential Grassland Habitat: The Flying H Ranch is located at the northern end of a large (500,000+ acres) priority grassland area in the Upper San Pedro River watershed that is considered as important for protection and restoration. The protection of grassland landscapes within the Sky Island Region, to provide habitat for wildlife and connectivity with the surrounding mountain ranges, is a high priority of numerous conservation groups such as The Nature Conservancy, The Trust for Public Land, and Sky Island Alliance. Although the Flying H Ranch currently has substantial encroachment (mesquite, creosote, etc.), The Trust for Public Land intends selling the Property to the Ladd family to manage as part of the large adjacent Ladd Ranch; the Ladds desire, and have the expertise and experience, to work on restoration of grasslands and removal of shrub on the Flying H Ranch over time to benefit both livestock grazing and wildlife.

5. RESERVED RIGHTS AND PROHIBITED PROPERTY USES UNDER CONSERVATION EASEMENT

This section is included in order to provide notes and/or comments about some of the reserved rights and prohibited uses of the Property in accordance with the terms of the Conservation Easement; these reserve rights and prohibited uses are found in Sections 4 and 5, respectively, of the Conservation Easement. (References to paragraph numbers and exhibits in these excerpts refer to paragraphs and exhibits in the Conservation Easement.) In the event of any conflict between text referenced or summarized in this report and the Conservation Easement, the Conservation Easement shall control.

As described in the Introduction section of this report, The Trust for Public Land (Grantor) intends to convey the Property to The San Jose Ranch, Inc., managed by John Ladd, after the deed of Conservation Easement is recorded on the Property. Therefore The San Jose Ranch, Inc. would become Grantor under the Conservation Easement as an assign under Section 15(g) of the Conservation Easement. For the clarification of the current conditions and comments provided in this section of the report, we have referred to John Ladd (as manager of The San Jose Ranch, Inc.) in this section of the report

4. Reserved Rights (of the Conservation Easement). Grantor reserves for itself and its personal representatives, heirs, successors, and assigns, all rights accruing from ownership of the Property, including the right to engage or permit or invite others to engage in all uses and activities on the Property that are not expressly prohibited herein

and are not inconsistent with the purpose of the Conservation Easement or the express terms and conditions set forth herein. Without limiting the generality of the permitted uses and activities, the following uses and activities are expressly permitted:

- (a) To carry on ranching and educational operations on the entire property.

Current condition/comments: Prior to The Trust for Public Land's purchase of the Flying H Ranch, it had been used for cattle grazing.

- (b) To maintain, repair and construct the necessary agricultural improvements as reasonably necessary to facilitate the livestock grazing operations, including range livestock water, which usage shall be limited to livestock stock tanks, wildlife guzzlers and similar features with low water demand requirements.

Current condition/comments: There are several water wells on the property that have historically been used for livestock (e.g. stock tanks). The Grantee does not believe that such specific use of water will significantly impact the project's goal to substantially prevent future groundwater consumption from the Property.

- (c) To engage in and permit others to engage in recreational uses of the Property that do not substantially impact the Conservation Values of the Property.

Current condition/comments: Grantor and Grantee believe that many passive recreational uses of the Property, such as hiking, nature watching, or hunting, are consistent with the Conservation Values and may be beneficial for invitees of the Grantor.

- (d) To collect dead and down firewood.

- (e) To construct, maintain and repair such utilities and agricultural outbuildings as are necessary in connection with the future uses of the Property permitted herein and provided such structures are not used de facto for residential purposes or other purposes prohibited by this Easement.

Current condition/comments: There are very few agricultural improvements in good condition at the time of the Conservation Easement, and improvements such as corrals, livestock handling facilities or barns may be important for its intended use for livestock grazing. If the existing water wells are needed for the allowed purposes (e.g. to fill stock tanks for livestock and wildlife), then repairs and maintenance to the electric transmission lines may be needed.

- (f) To build, maintain and repair fences; any new or reconstructed barbed wire fences shall be consistent with any wildlife compatible fencing guidelines published by the Arizona Game and Fish Department.

Current condition/comments: *Much of the boundary fencing of the Property is missing or in disrepair, and repair and maintenance of boundary fencing would be important for effective livestock grazing. Internal fencing may also be needed for rotation and cattle management.*

- (g) To construct, maintain and repair necessary trails and vehicleways.
- (h) To construct, maintain and repair stock tanks, pipelines, dikes, berms, gabions, and similar livestock watering or erosion control structures.
- (i) To manage vegetation to obtain increased forage production, increased perennial grass cover and reduced soil erosion. Vegetation management operations include but are not limited to range seeding, mechanical and chemical brush control and prescribed fire.

Current condition/comments: *Land restoration is an objective of the Grantor and John Ladd.*

- (j) To restore native plant communities on the Property.

Current conditions: *There is currently substantial vegetative cover on the property of woody shrubs, including mesquite and creosote. It is the desire of Grantor and John Ladd that this could be converted/restored over time to provide for significant grassland cover for the benefit of livestock and wildlife.*

- (k) To use biocides and fertilizers for agricultural purposes, revegetation and control of noxious weeds and insect pests subject to following label recommendations, local, state and federal agency regulations for application, and generally accepted principles of safe and efficient use at the time of application.

Current condition/comments: *For the restoration activities described in the preceding right ("to restore native plant communities"...), the use of biocides for removal of woody shrub is one of the main techniques recognized as appropriate by USDA's Natural Resource Conservation Service.*

- (l) Hunting by Grantor or permittees of Grantor provided that any hunting is consistent with the hunting regulations of the State of Arizona.
- (m) The grazing and pasturing of livestock in accordance with current generally accepted practices of range management.

Current conditions/comments: *The primary intended use of the Property by Grantor and John Ladd is for livestock grazing.*

- (n) The right, but not the obligation, to remove any of the structures, debris or other manmade materials that existed on the Property prior to the effective date of this Easement.

Current conditions/comments: As described in the Site Description section of this report, there are a number of unusable buildings and other improvements on the Property, particularly at the site of the old ranch headquarters. John Ladd has expressed desire to be able to remove any old improvements in the future, provided there is no obligation imposed by the Conservation Easement to do so.

5. Prohibited Uses (of the Conservation Easement). Any activity on or use of the Property inconsistent with the purpose of this Easement is prohibited. Without limiting the generality of the foregoing, Grantor is expressly prohibited from carrying out the following activities and uses but Grantor shall have no responsibility for such activities carried out by third persons or governmental agencies over which Grantor has no control.

- (a) Construction or placing of any buildings, permanent camping accommodations, power lines, mobile homes or billboards except construction of agricultural or ranching outbuildings as provided in Section 4 herein. Grantor shall be permitted to maintain, repair, replace or extend power lines as may be needed to provide electricity to water wells for the agricultural uses that are permitted herein.

Current condition/comments: There are currently few improvements to the Property, except those noted in Section 3 of this report (especially in the old ranch headquarters area of Area A) and the photo documentation.

- (b) Confinement livestock feeding in which animals are permanently located in enclosures and the majority of their feed supplied from outside sources. This includes but is not limited to cattle feeding, dairy, hog, ostrich, and emu farm operations. This paragraph shall not be construed to prevent the temporary or supplemental feeding of livestock.

- (c) Irrigation of pasture or other crops by groundwater pumping.

Current conditions/comments: There are no crops or irrigated pasture on the Property at the time of this report. This prohibition is because of a primary objective of the Conservation Easement to eliminate future uses of the Property that will require groundwater (except for the small amount that may be needed for livestock watering).

- (d) Commercial or industrial uses except for ranching and ecotourism operations.

- (e) Surface alternation or natural vegetation alteration other than that necessary or helpful to accommodate the uses of the Property authorized herein including the restoration of grasslands and erosion abatement.

- (f) The legal or de facto subdivision of the Property for any purpose. Grantor shall not transfer title to the Property except in its current entire configuration, even if the Property is comprised of separate legal parcels. Notwithstanding the foregoing, however, Grantor may divide the Property into no more than two separate parcels (the "Divided Parcels"), each of which may be under separate ownership and operated as an independent unit, provided that each Divided Parcel shall remain subject to all the terms of this Easement. Any further right of legal or de facto division of the overall Property shall be extinguished, it being the intent of Grantor and Grantee that the Property shall not be separated into more than a maximum of two (2) parcels.

Current condition/comments: Grantee would prefer that all of the Property remain under single ownership to avoid additional administrative burden and monitoring of multiple landowners, and reduce the potential for violations of the Conservation Easement. At request of Grantor, the Grantee is agreeable to allow one division of the Property under the Conservation Easement.

- (g) Dumping or storage of refuse, or other unsightly, offensive or toxic materials including, without limitation, livestock carrion. Notwithstanding anything in this Easement to the contrary, this prohibition does not make the Grantee an owner of the Property, nor does it permit the Grantee to control any use of the Property by the Grantor which may result in the storage, dumping, or disposal of hazardous or toxic materials; provided, however, that the Grantee may bring an action to protect the conservation values of the Property as described in this easement. (This prohibition does not impose liability on the Grantee, nor shall the Grantee be construed as having liability as a "responsible party" under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or similar federal or state statutes.)

Current condition/comments: There are currently no known sites of dumping or storage of such materials on the Property except for a small location south of the old gravel quarry in Section 33 where some old car tires (approximately 12) have been dumped.

- (h) Any stocking of non-native fish or amphibians or other non-native organisms to or from catchments, tanks, springs or creeks.
- (i) Filling, excavating, dredging, mining, drilling, exploration or extraction of minerals, hydrocarbons, soils, sand, gravel, rock or other materials on or below the surface of the Property except as necessary in connection with such activities as may be useful in performing any of the activities permitted pursuant to Section 4 herein. Additionally Grantor shall not lease or transfer any rights to third parties for such uses.

Current conditions/comments: There is an old quarry site located in Section 33 (see Site Description for Area B) where rock and gravel was quarried in the 1960's.

While there may be some future de minimus uses of existing rock and other natural material for allowed uses on the Property (e.g. use of rocks to build gabions for erosion control), mining and the other extractive activities are not consistent with the Conservation Values.

- (j) Pumping of groundwater for other than on-site agricultural uses associated with livestock grazing on the Property as provided for herein or restoration of native vegetation.

Current conditions/comments: *The only recent uses for the water wells on the Property have been for livestock watering.*

- (k) Storage and use of biocides and chemical fertilizers, except for residential and agricultural purposes permitted herein.

Current conditions/comments: *There is no known storage of such materials at the time of this report.*

- (l) Off road vehicle travel except as reasonably necessary to facilitate agricultural, ranching and related operations.

Current conditions/comments: *Use of vehicles, such as all-terrain vehicles, for off-road recreational uses is destructive to wildlife habitat and the Conservation Values.*

6. PHOTOGRAPHS.

Photographs documenting the current condition of the Protected Property accompany this report and are incorporated by reference. The photographs were taken on August 11, 2015. (A site visit made in January 2016 confirmed that these still accurately show the condition of the Property.) A brief description of each photograph appears in Exhibit E and the photographs following; the coordinates of each photo point used are also provided in Exhibit E and these locations are also shown on the plat in Exhibit D-2.

7. OTHER PROPERTY INFORMATION.

Parcels:

The Property contains the following ten tax assessor parcels per the records of Cochise County:

<i>In Section 33, T23S, R23E Parcel 102-01-005</i>
<i>In Section 35, T23S, R23E Parcels 102-01-007B, 102-01-007C, 102-01-007E, 102-01-007G, 102-01-007H, 102-01-007J</i>

<i>In Sections 4 & 5, T24S, R23E</i> Parcels 102-34-001F, 102-34-001G, 102-34-014
--

Minerals Estate:

- The legal description of Exhibit C shows that minerals were retained by the federal government through the original land patents for the land in Sections 33 and 35 (Parcel 1 and Parcel 2 of the legal description, respectively). More detail on the mineral reservation can be found in those original land patents.
- Additionally a ½ interest in oil and gas was reserved in a deed for the Parcel 3 property (as that property is described in Exhibit C). This deed is recorded in Book 147 of Deeds, page 143, Cochise County records, deeded signed in April 1946.

Water Wells

There are three registered water wells located on the property at date this baseline report was prepared.

Well 55-603148: This well is located by the old ranch headquarters for 'domestic' use with a well depth of 300 feet and a groundwater depth of 97' when drilled in 1973. This well is not functional at time of the baseline report.

Well 55-602968: This well is located by the water tank north of Highway 92 and is registered for stock tank use with a well depth of 800' and groundwater depth of 265' when drilled in 1969. It has been in recent use to supply water to stock tank.

Well 55-218989: This well, located by Highway 92 approximately ¼ mile east of milepost 346 and twenty feet north of the highway right-of-way, is registered for 'municipal use' with a well depth of 528' and groundwater depth of 271' when drilled. The well is capped and currently not in use. The well was constructed in 2009 by Cochise County 1900, LLC, the residential development entity that owned the property for several years and drilled this well as part of its plans for development of the property.

Exhibit A
Location Map of the Property (Sierra Vista Subwatershed)

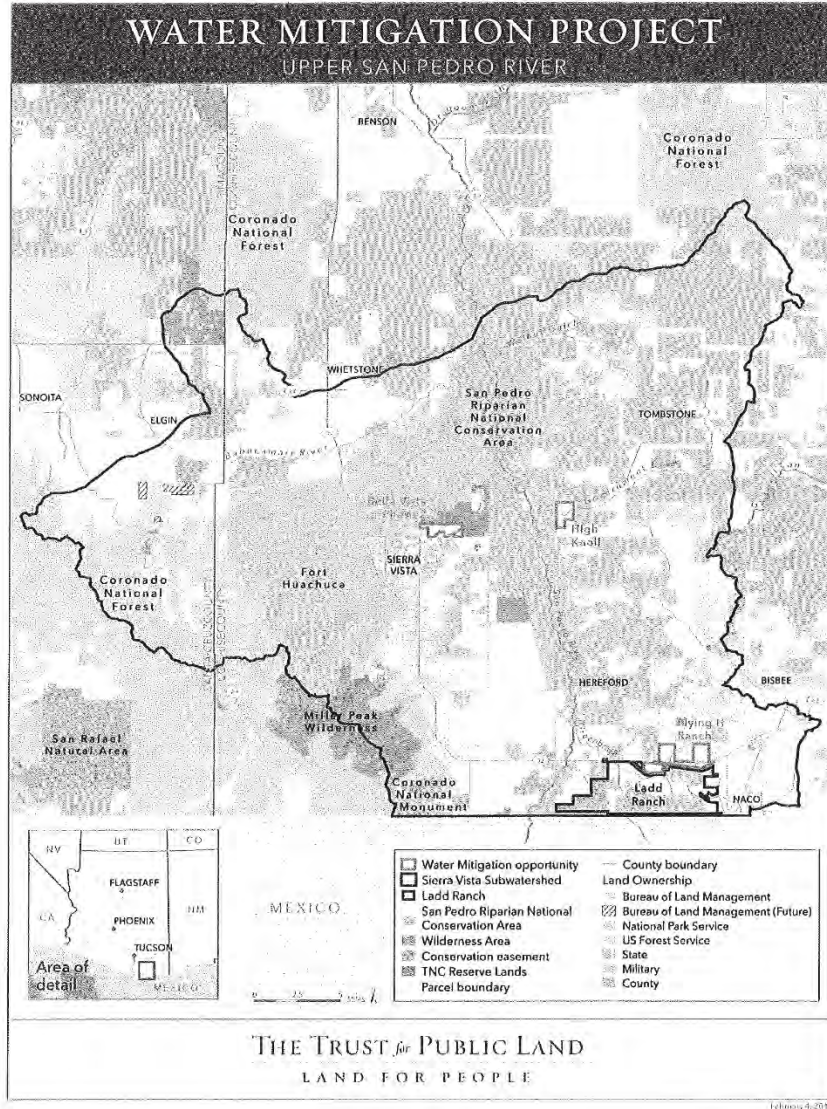


Exhibit B
Location Map of the Property (San Pedro River to City of Bisbee)

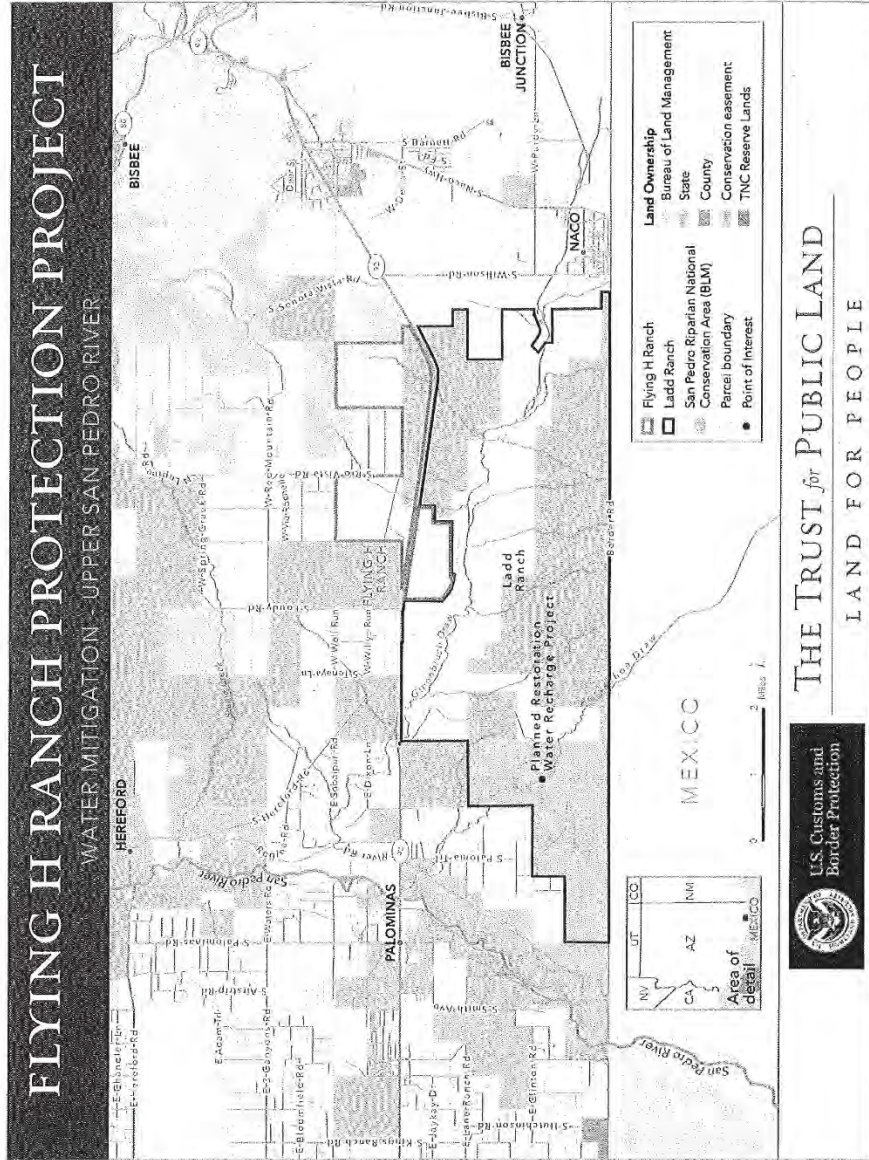


Exhibit C
Legal Description of the Property

PARCEL NO. 1:

ALL OF SECTION 33, TOWNSHIP 23 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ALL COAL AND OTHER MINERALS AS RESERVED IN THE PATENT TO THE LAND.

PARCEL NO. 2:

ALL OF SECTION 35, TOWNSHIP 23 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ALL COAL AND OTHER MINERALS AS RESERVED IN THE PATENT TO THE LAND.

PARCEL NO. 3:

THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 4;

AND THE SOUTHWEST QUARTER, THE NORTH HALF OF THE SOUTHEAST QUARTER.
AND THE NORTH HALF OF SECTION 5;

ALL IN TOWNSHIP 24 SOUTH, RANGE 23 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT ANY PORTION THEREOF LYING WITHIN STATE HIGHWAY 92.

EXCEPT ANY PORTION OF SAID SECTION 5 LYING SOUTH OF THE NORTHERLY LINE THE SOUTHERN PACIFIC RAILROAD RIGHT OF WAY.

EXCEPT THAT PORTION CONVEYED TO THE ARIZONA HIGHWAY DEPARTMENT IN QUIT CLAIM DEED RECORDED AS DOCKET 267, PAGE 14.

EXCEPT ANY PORTION OF SAID SECTION 5 LYING WITHIN THE FOLLOWING DESCRIBED PARCEL OF LAND: .

A PORTION OF THE WEST HALF OF THE WEST HALF OF SECTION 5 AND THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 6 OF TOWNSHIP 24 SOUTH, RANGE 23 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

COMMENCING AT A ONE-INCH BURIED PIN MONUMENT FOR THE NORTHWEST CORNER OF SAID SECTION 5;

THENCE SOUTH 00 DEGREES 09 MINUTES 54 SECONDS EAST, A DISTANCE OF 144.30 FEET ALONG THE LINE OF SAID SECTIONS TO A NON-TANGENT CURVE POINT ON THE SOUTHERLY HIGHWAY 92 RIGHT OF WAY AND THE POINT OF BEGINNING;

THENCE 618.40 FEET ALONG A RIGHT OF WAY CURVE TO THE RIGHT HAVING A DELTA ANGLE OF 03 DEGREES 22 MINUTES 30 SECONDS AND A RADIUS OF 10,500.00 FEET;

THENCE SOUTH 81 DEGREES 25 MINUTES 12 SECONDS EAST, A DISTANCE OF 46.97 FEET ALONG SAID RIGHT OF WAY;

THENCE SOUTH 00 DEGREES 09 MINUTES 54 SECONDS EAST, A DISTANCE OF 3017.32 FEET;

THENCE NORTH 50 DEGREES 53 MINUTES 03 SECONDS WEST, A DISTANCE OF 952.38 FEET ALONG THE NORTHERLY LINE OF RAILROAD;

THENCE NORTH 89 DEGREES 55 MINUTES 34 SECONDS EAST, A DISTANCE OF 77.20 FEET TO THE COMMON QUARTER CORNER OF SAID SECTIONS;

THENCE NORTH 00 DEGREES 09 MINUTES 54 SECONDS WEST, A DISTANCE OF 2497.54 FEET ALONG THE LINE OF SAID SECTIONS TO THE POINT OF BEGINNING.

AND EXCEPT AN UNDIVIDED 1/2 INTEREST IN AND TO ALL OIL AND GAS, AS RESERVED IN DEED RECORDED IN BOOK 147 OF DEEDS, PAGE 143.

Exhibit D-1
Map of Flying H Ranch

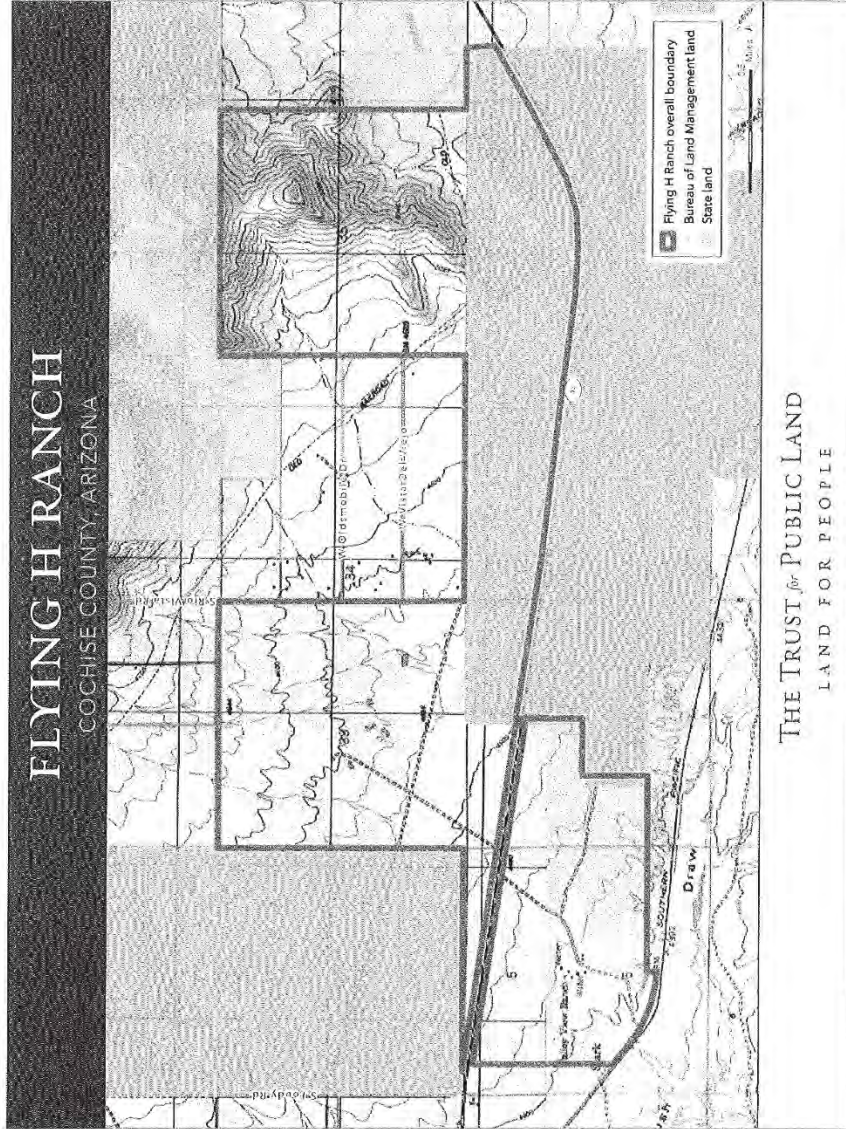


Exhibit D-2

Map of Flying H Ranch (with Photo Point locations and annotations)

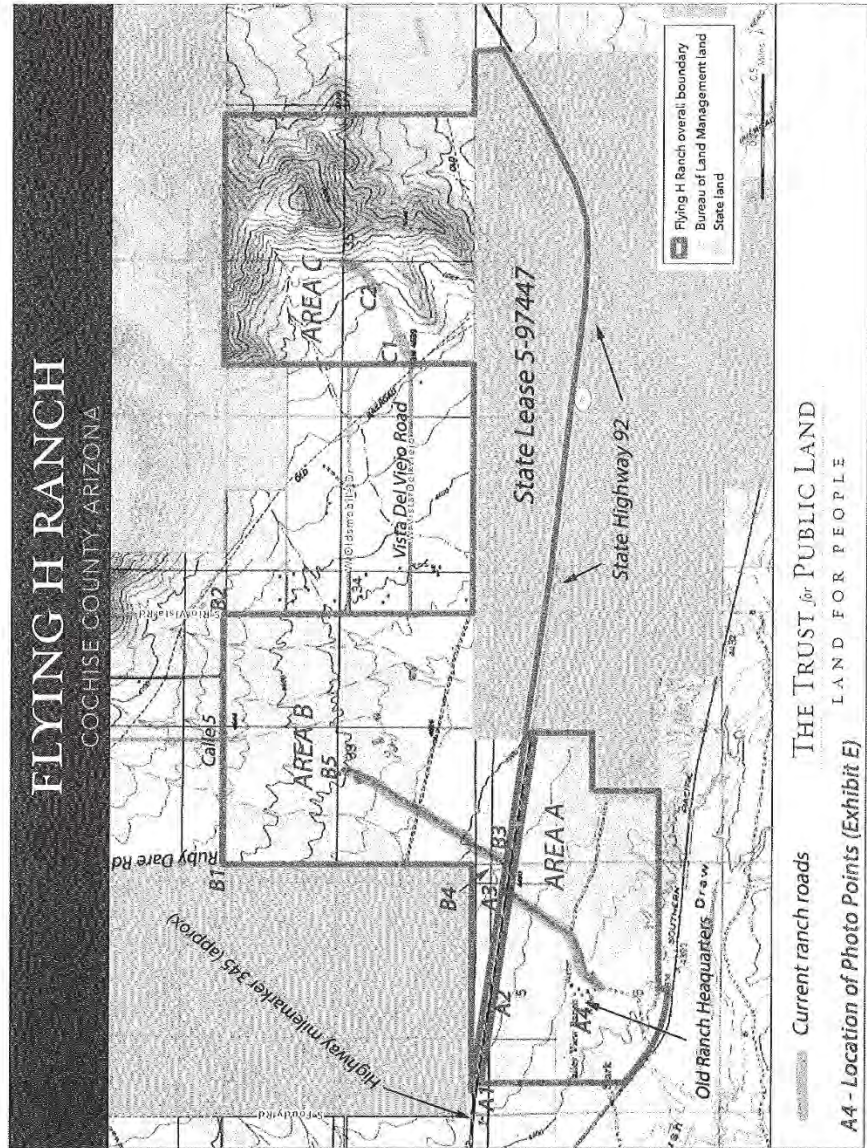


Exhibit E
List of Photographs
Flying H Ranch

The photographs listed below and incorporated herein were taken on August 11, 2015. The photographs accompany this report. (Photo points are shown on the map attached as Exhibit D-2 of this report.)

Photo Point A-1

GPS Coordinates: Latitude 31.379607° North; Longitude 110.033285° West

From State Hwy 92 at west end of Property, just east of highway mile-marker 345.

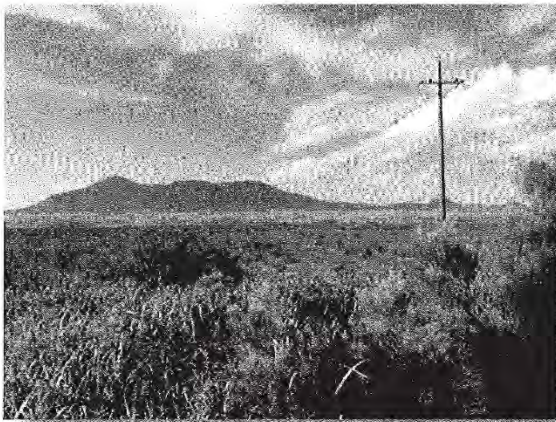


Looking east along State Highway 92 as it enters west side of Property. Note electric transmission lines that run along Highway and Property.

Photo Point A-2

GPS Coordinates: Latitude 31.378489° North; Longitude 110.028712° West

From State Hwy 92.



Looking south from State Highway 92 along electric transmission line that runs from highway south to area of old ranch headquarters.

Photo Point A-3

GPS Coordinates: Latitude 31.377721° North; Longitude 110.022551° West

Ranch road entrance to ranch headquarters from State Highway 92.



Entrance gate and ranch road running south from State Highway 92 to old ranch headquarters.

Photo Point A-4 (Note: See Exhibit G for plat showing more detail of structures located at this old ranch headquarters area.)

GPS Coordinates: Latitude 31.373247° North; Longitude 110.029084° West

Area of old ranch headquarters

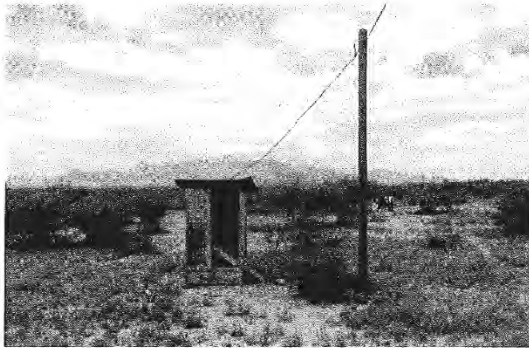


Old adobe building previously used as a saddle barn and workshop (approx. 1,400 square feet).

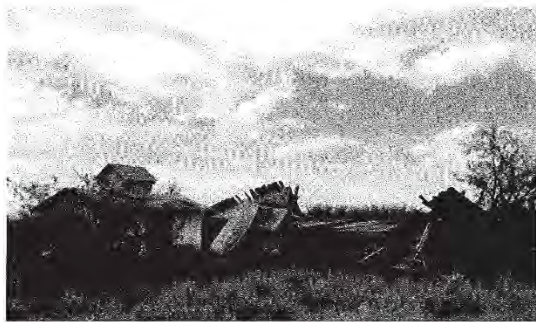
Photo Point A-4 (continued)



Main ranch house building (approx. 900 square feet), mostly covered by surrounding vegetation. Walls, roof and interior are in very poor condition.

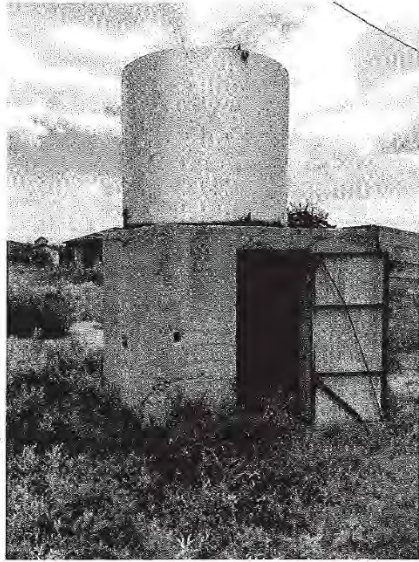


Water well shack at ranch headquarters area. (This is Well No. 55-603148.)



Ruins of old ranch outbuildings in this ranch headquarters area

Photo Point A-4 (continued)



Water storage tank (approx. 500 gallon capacity) on cinder block foundation.

Photo Point B-1

GPS Coordinates: Latitude 31.394290° North; Longitude 110.020411° West
Northwest corner of Section 33



Looking southeast across Section 33 from corner at which Calle 5 and Ruby Dare Road intersect.

Photo Point B-2

GPS Coordinates: Latitude 31.394052° North; Longitude 110.003820° West
Northeast corner of Section 33



Looking south across Section 33 at which S. Rio Vista Road and Calle 5 intersect. S. Rio Vista Road visible on left side of photo, subdivided parcels adjacent to Flying H Ranch are on east side of that road.

Photo Point B-3

GPS Coordinates: Latitude 31.377952° North; Longitude 110.020728° West
Ranch road entrance from State Highway 92

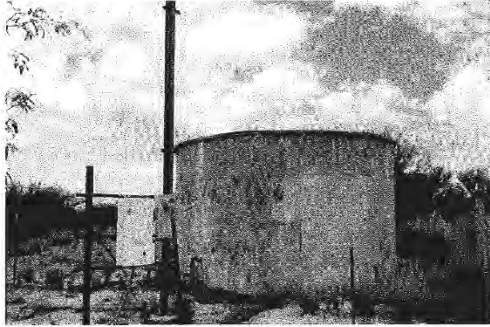


Looking north from Highway 92 to gate and ranch road entering Section 33. Note electric transmission line that runs from highway to Photo Point B-4 (to power water well pump).

Photo Point B-4

GPS Coordinates: Latitude 31.378924° North; Longitude 110.020197° West

Water well and water storage tank on Section 33



Water storage tank located near State Highway. Meter is termination of electric transmission line (shown in Photo Point B-3), and power line from circuit breaker goes to water well.



Water well located at this area. (Well No. 55-602968.)

Photo Point B-5

GPS Coordinates: Latitude 31.387249° North; Longitude 110.014648° West
Area in Section 33 of old gravel pit



Looking at side of old gravel quarry site located near center of Section 33.

Photo Point C-1

GPS Coordinates: Latitude 31.383646° North; Longitude 109.986868° West
West boundary of Section 35 at end of Vista Del Viejo Road



Photo looking east at ranch road that continues from Vista Del Viejo Road into Section 35. (This taken from section line along the western boundary of Section 35.)

Photo Point C-2

GPS Coordinates: Latitude 31.385064° North; Longitude 109.980536° West

From up on ranch road as it climbs up Naco Hills on Section 35



Photo looking west toward Section 33 of Property and Huachuca Mountains in background. Prominent dirt running west is Vista Del Viejo Road as it runs across adjacent Section 34. Obvious residential uses on parcels on Section 34 (between Sections 33 and 35 of Property), and also to north of Section 33 of Property.

Exhibit F
Aerial Photograph of Property

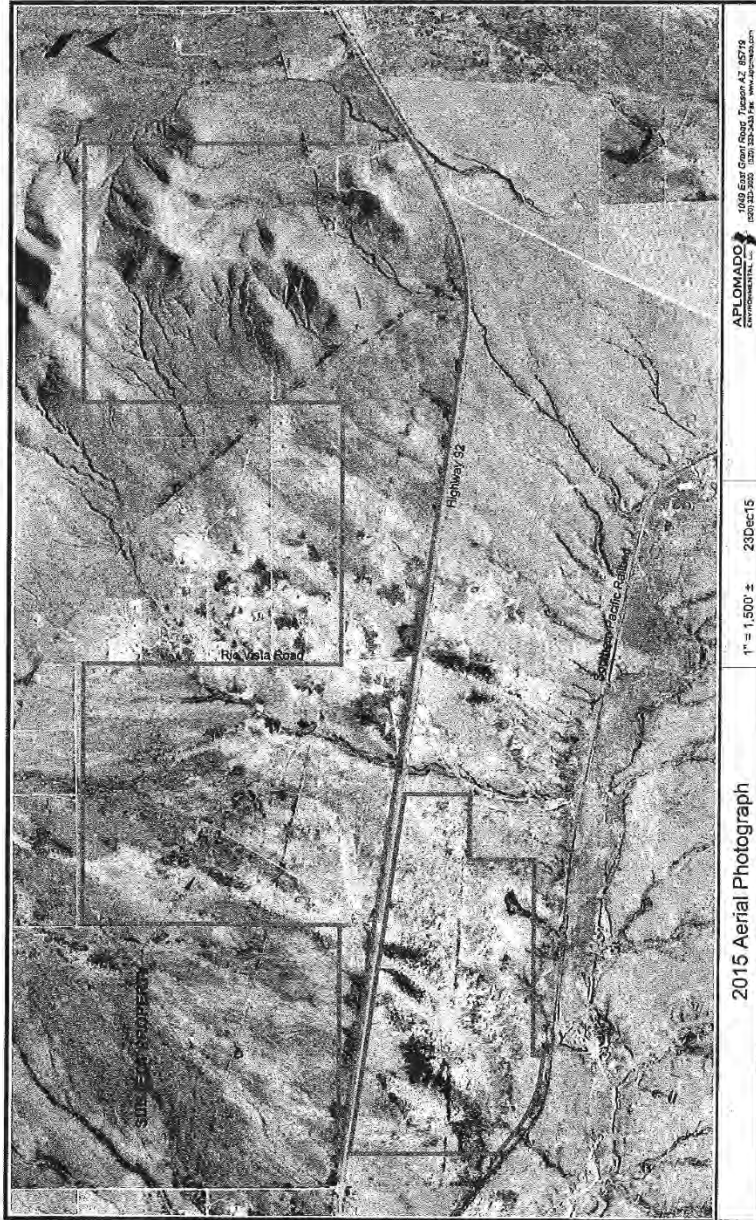
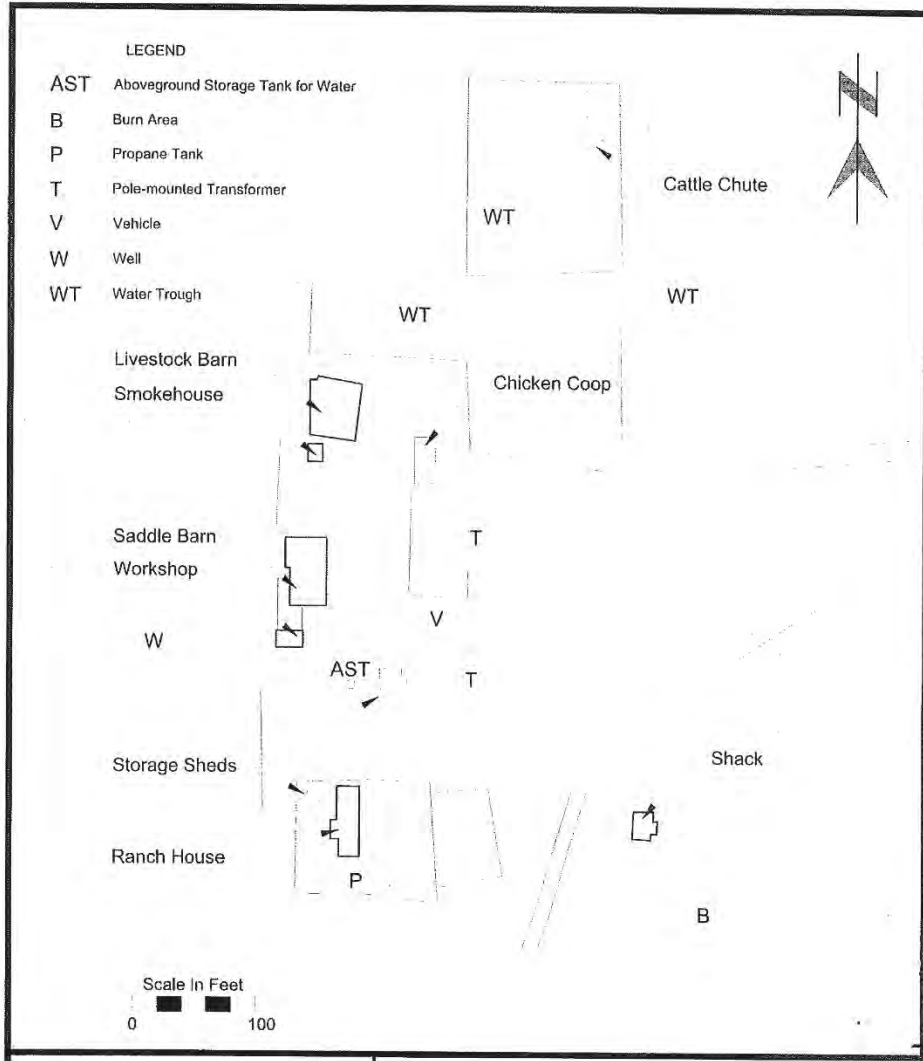


Exhibit G
Detail of Structures in Old Ranch Headquarters Area
(this area labeled as Photo Point A4 in Exhibit D-2)



**FLYING H RANCH
CONSERVATION EASMENT
BASELINE DOCUMENTATION REPORT**

**1,912 acres in the San Pedro River Watershed
Along State Highway 92 between
San Pedro River and City of Bisbee
Cochise County, Arizona**

**A Land and Water Protection Project of
U.S. Homeland Security/Customs and Border Protection and
The Trust for Public Land**

Condition of the Property as of February 26, 2016

Prepared by:

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Arizona Program Manager
The Trust for Public Land
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