

September  
2020



*Final*

# Environmental Stewardship Plan

**FENCE REPLACEMENT PROJECTS  
IN COCHISE AND PIMA COUNTIES,  
TUCSON SECTOR, ARIZONA**

*Department of Homeland Security  
U.S. Customs and Border Protection*



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## Cover Sheet

### Final Environmental Stewardship Plan Fence Replacement Projects in Cochise and Pima Counties, Tucson Sector, Arizona

**Responsible Agencies:** Department of Homeland Security (DHS), United States (U.S.) Customs and Border Protection (CBP), and U.S. Border Patrol (USBP).

**Parties Consulted:** Department of the Interior (DOI), including the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), and U.S. Fish Wildlife Service (USFWS); National Park Service (NPS); U.S. Forest Service (USFS); U.S. Environmental Protection Agency (USEPA); U.S. Army Corps of Engineers (USACE); United States Section, International Boundary and Water Commission (USIBWC); Arizona State Historic Preservation Office (AZSHPO); Arizona Game and Fish Department (AGFD); and local tribes.

**Affected Location:** U.S./Mexico international border in Cochise and Pima counties, Tucson Sector, Arizona

**Project Description:** CBP proposes to improve and maintain 63 miles of fence along the U.S./Mexico international border in Arizona. CBP is proposing to install and maintain tactical infrastructure consisting of replacement primary pedestrian fence within CBP's Tucson West and East sectors along Cochise and Pima counties, Arizona (Sections 1A, 2, 1B, 3A, 3B, and 3C) (the Project Area).

The westernmost three segments of the Project Area (1A, 2, and 1B) occur within Tucson West Sector in Pima County, Arizona. Segment 1 includes the replacement of two sections of vehicle barrier with the first (Section 1A) beginning approximately 2 miles west of the Lukeville Port of Entry (POE) continuing west approximately 30 miles. Section 1B fence replacement begins approximately 3 miles east of the Lukeville POE and continues east for approximately 8 miles. Segment 2 includes approximately 5 miles of primary pedestrian fence replacement around the Lukeville POE, extending from approximately 2 miles west of the POE to approximately 3 miles east of the POE.

The easternmost segment includes Sections 3A, 3B, and 3C, which occur within the Tucson East Sector in Cochise County, Arizona. Section 3 includes three segments of vehicle barrier replacement beginning approximately 18 miles west of the Naco POE and continuing to approximately 25 miles east of the Douglas POE (or approximately 5 miles west of the Arizona/New Mexico state line) for approximately 20 miles of non-contiguous vehicle barrier replacement.

**Report Designation:** Final Environmental Stewardship Plan (ESP).

**Abstract:** CBP is constructing approximately 63 miles of border barrier projects in areas where the existing barrier no longer meets the USBP's operational needs. The Project Area lies within the USBP Tucson Sector. This ESP evaluates potential environmental impacts associated with the project. Protections and best management practices (BMPs) for factors such as air quality, noise, land use and recreation, geological resources and soils, hydrology and water management, biological resources, cultural resources, socioeconomics, and hazardous materials and waste have been incorporated into the project design.

**FINAL**

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**ENVIRONMENTAL STEWARDSHIP PLAN  
FENCE REPLACEMENT PROJECTS  
IN COCHISE AND PIMA COUNTIES,  
TUCSON SECTOR, ARIZONA**

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**DEPARTMENT OF HOMELAND SECURITY  
U.S. CUSTOMS AND BORDER PROTECTION  
U.S. BORDER PATROL**

**SEPTEMBER 2020**

## **Executive Summary**

### **BACKGROUND**

On April 24, 2019, the Secretary of the Department of Homeland Security (DHS), pursuant to Section 102(c) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996, as amended, issued a waiver to ensure the expeditious construction of barriers and roads in the United States Border Patrol's (USBP) Tucson Sector. Although the Secretary's waiver means that United States (U.S.) Customs and Border Protection (CBP) no longer has any specific legal obligations under the laws set aside by the waiver, DHS and CBP recognize the importance of responsible environmental stewardship. To that end, CBP has prepared this Environmental Stewardship Plan (ESP), which analyzes the potential environmental impacts associated with construction of tactical infrastructure in the USBP Tucson Sector. The ESP also discusses CBP's plans to potentially mitigate environmental impacts.

As it moves forward with the Project described in this ESP, CBP will continue to work in a collaborative manner with local governments, state and federal land managers, and the interested public to identify environmentally sensitive resources and develop appropriate best management practices (BMPs) to avoid or minimize adverse impacts resulting from the project.

### **GOALS AND OBJECTIVES OF THE PROJECT**

The project will allow USBP agents to strengthen control of the U.S. border between Ports of Entry (POE) in the USBP Tucson Sector. The project will help deter illegal entries within the USBP Tucson Sector by improving enforcement efficiency, so that USBP is better equipped to prevent terrorists and terrorist weapons, cross-border violators (CBVs), drugs, and other contraband from entering the U.S., while contributing to a safer work environment for USBP agents and the public.

### **OUTREACH AND AGENCY COORDINATION**

CBP coordinates with numerous government agencies and tribes regarding potential project impacts. Stakeholders with interests in the region include the Department of the Interior (DOI), Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), U.S. Section of the International Boundary and Water Commission (USIBWC), U.S. Environmental Protection Agency (USEPA), U.S. Army Corps of Engineers (USACE), state and local governments, as well as various local tribes.

### **DESCRIPTION OF THE PROJECT**

CBP will replace several existing segments of vehicle and pedestrian fence totaling approximately 63 miles with new bollard wall in the Ajo and Douglas Station Area of Responsibilities (AORs) within the USBP Tucson Sector (the Project). The Project also includes the installation of a linear ground detection system, road construction or refurbishment, and the installation of lighting, which will be supported by grid power and include embedded cameras. The design of the new steel bollard fencing includes 30-foot steel bollards that are approximately 6" x 6" in diameter.

The Project will occur within CBP’s Tucson West and East sectors along Cochise and Pima counties, Arizona (Sections 1A, 2, 1B, 3A, 3B, and 3C) (the Project Area).

The westernmost three segments of the Project Area (1A, 2, and 1B) occur within Tucson West Sector in Pima County, Arizona. Segment 1 includes the replacement of two sections of vehicle barrier with the first (Section 1A) beginning approximately 2 miles west of the Lukeville POE continuing west approximately 30 miles. Section 1B fence replacement begins approximately 3 miles east of the Lukeville POE and continues east approximately 8 miles. Segment 2 includes approximately 5 miles of primary pedestrian fence replacement around the Lukeville POE extending from approximately 2 miles west of the POE to approximately 3 miles east of the POE.

The easternmost segment includes Sections 3A, 3B, and 3C, which occur within the Tucson East Sector in Cochise County, Arizona. Section 3 includes three segments of vehicle barrier replacement beginning approximately 18 miles west of the Naco POE and continuing to approximately 25 miles east of the Douglas POE (or approximately 5 miles west of the Arizona/New Mexico state line) for approximately 20 miles of non-contiguous vehicle barrier replacement.

## ENVIRONMENTAL IMPACTS AND BEST MANAGEMENT PRACTICES

The Project could result in impacts on several resource categories; however, BMPs are recommended to minimize or eliminate impacts on the discussed resources. Specific BMPs would be implemented to ensure minimal disturbance to the resources within the Project Area.

**Table ES-1** provides an overview of potential environmental impacts by specific resource area and a brief summary of associated BMPs. **Chapter 3** through **12** of this ESP provide the evaluation for these impacts and expand upon the BMPs.

**Table ES-1. Summary of Environmental Impacts, Mitigation, and BMPs**

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
<b>Air Quality</b>	Minor and temporary impact on air quality have the potential to occur during construction; all calculated air emissions, except for particulate matter less than or equal to 10 microns in diameter (PM <sub>10</sub> ), will remain below <i>de minimis</i> levels.	Bare soil will be wetted to suppress dust, and equipment will be maintained according to specifications.
<b>Noise</b>	Minor temporary increases to ambient noise during construction activities have the potential to occur but will not contribute to cumulative impacts of ambient noise levels. Noise impacts have the potential to be greatest during pile-driving activities.	Equipment will be operated on an as-needed basis. Mufflers and other equipment will be properly maintained to reduce noise. All generators will be in baffle boxes, have an attached muffler, or use other noise-abatement methods in accordance with industry standards.

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
<p><b>Land Use, Recreation, and Aesthetics</b></p>	<p>Minor impacts have the potential to occur on land use as a result of the Project in areas of new construction. Minimal impacts on visual resources and character of the land are expected. The Project could have minimal, temporary impacts on recreation in Cabeza Prieta National Wildlife Refuge, San Bernardino National Wildlife Refuges, Organ Pipe Cactus National Monument, Coronado National Memorial, and San Pedro Riparian National Conservation Area.</p>	<p>Environmental monitors will be present during construction to ensure construction activities remain within the Project footprint and impacts on the National Memorial, National Wildlife Refuge, and National Conservation Area lands are minimized.</p>
<p><b>Geologic Resources and Soils</b></p>	<p>Moderate impacts on soils have the potential to occur as a result of the Project. The majority of the impacts will involve only topsoil layers. Approximately 23 acres of previously disturbed soils within the fence footprint will be permanently disturbed.</p>	<p>A Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention, Control, and Countermeasure Plan (SPCCP) will be implemented as part of the Project.</p>
<p><b>Groundwater</b></p>	<p>The Project has the potential to have minor to moderate adverse impacts to the availability of water resources in the region. There is a potential for groundwater contamination as a result of a petroleum-based product spill.</p>	<p>A SPCCP and SWPPP will be implemented as part of the Project.</p>
<p><b>Surface Waters and Waters of the United States</b></p>	<p>Some surface waters, including Waters of the U.S. jurisdictional waters such as Black Draw, have the potential to experience minor, short-term impacts.</p>	<p>A SPCCP and SWPPP will be implemented as part of the Project.</p>
<p><b>Floodplains</b></p>	<p>The Project has the potential to impact 0.2 acres of floodplains. The Project has the potential to have minor and temporary impacts from sedimentation, erosion, and accidental spills or leaks caused by construction.</p>	<p>None required.</p>
<p><b>Vegetation</b></p>	<p>Disturbed habitat has the potential to be temporarily impacted by the staging areas and permanently impacted by the fence replacement.</p>	<p>A monitor will be on site during construction to ensure that construction activities remain within the Project footprint.</p>
<p><b>Wildlife and Aquatic Resources</b></p>	<p>Negligible to minor impacts on wildlife have the potential to occur. Potential loss of small mammals and reptiles during construction could occur. Approximately 0.11 acres of aquatic habitat could experience minor, short-term impact.</p>	<p>Surveys of nesting migratory birds will be conducted, and migratory bird nests will be flagged and avoided if construction occurs during breeding/nesting season. Use of lights during construction will be minimized.</p>

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
<b>Protected Species and Critical Habitat</b>	Federally-listed species and Critical Habitat has the potential to be impacted at Black Draw. The project could have a minor to moderate impact on state-listed species.	A monitor will be on site during construction to survey for state-listed species within the active construction footprint. State-listed species would be relocated as needed.
<b>Cultural Resources</b>	No National Register of Historic Places (NRHP)-eligible cultural resources will be impacted by the Project.	All construction will be restricted to previously surveyed areas. If any cultural material is discovered during construction, all activities within the vicinity of the discovery will be halted until receipt of clearance to resume work by a qualified archaeologist.
<b>Socioeconomics</b>	Short-term, beneficial impacts on the local economy have the potential to occur.	None required.
<b>Hazardous Materials and Waste</b>	Soils could be impacted by hazardous or toxic materials in the event of an accidental spill, which could lead to groundwater contamination. However, no hazards to the public are expected through the transport, use, or disposal of unregulated solid waste. The proper permits would be obtained by the licensed contractor tasked to handle any unregulated solid waste and all of the unregulated solid waste being handled in the proper manner.	A SPCCP will be implemented as part of the Project.

CBP followed specially developed design criteria to reduce adverse environmental impacts. Design criteria to reduce adverse environmental impacts included consulting with federal and state agencies and other stakeholders to develop appropriate BMPs and minimizing physical disturbance where practicable. BMPs will include implementation of a Spill Prevention, Control, and Countermeasure Plan (SPCCP), Storm Water Pollution Prevention Plan (SWPPP), Environmental Protection Plan, Dust Control Plan, and Fire Prevention and Suppression Plan. CBP will have environmental monitors on site and impacts will be documented during construction to determine the extent and scope of mitigation measures necessary to reduce or offset adverse environmental impacts.

In addition to the design criteria and BMPs, CBP may implement mitigation measures. The scope or extent of CBP’s mitigation will be based on the actual impacts from the Project and available funding. CBP will assess the actual impacts from the Project upon completion. CBP’s assessment will be based on, among other things, feedback from environmental monitors and the final construction footprint. To the extent mitigation is warranted and funding is available, CBP will work with stakeholders to identify and implement appropriate mitigation measures.



The following definitions describe various impact characteristics:

- *Short-term or long-term.* These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term impacts are those that occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.
- *Direct or indirect.* A direct impact is caused by an action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by an action and might occur later in time or be farther removed in distance but is still a reasonably foreseeable outcome of the action.
- *Negligible, minor, moderate, or major.* These relative terms are used to characterize the magnitude or intensity of an adverse or beneficial impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. A minor impact is slight, but detectable. A moderate impact is readily apparent. A major impact is severe.
- *Adverse or beneficial.* An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one environmental resource and beneficial impacts on another resource.

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## 1. GENERAL PROJECT DESCRIPTION

### 1.1 INTRODUCTION TO THE ENVIRONMENTAL STEWARDSHIP PLAN

The United States (U.S.) Customs and Border Protection (CBP) will replace several existing segments of vehicle and pedestrian fence totaling approximately 63 miles with new bollard wall in the Ajo and Douglas Station Area of Responsibilities (AORs) within the U.S. Border Patrol (USBP) Tucson Sector (the Project). This new bollard fence design is critical to the Tucson Sector's ability to prevent illegal entries and to achieve operational control of the border commensurate with Executive Order (EO) 13767. Under this EO, CBP is directed to "...secure the southern border of the United States through the immediate construction of a physical wall on the southern border, monitored and supported by adequate personnel so as to prevent illegal immigration, drug and human trafficking, and acts of terrorism."

Section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) mandates the Department of Homeland Security (DHS) to install and improve fencing, barriers, and roads along the U.S. border. In 2019, the Secretary of DHS, pursuant to Section 102(c) of IIRIRA, determined that it is necessary to waive certain laws, regulations, and other legal requirements to ensure expeditious construction of the barriers and roads in the Tucson Sector. Although the Secretary's waiver means that CBP no longer has any specific legal obligations to do so, DHS and CBP are committed to continue to protect valuable natural and cultural resources through responsible environmental stewardship.

This Environmental Stewardship Plan (ESP) presents the analysis for the potential environmental impacts associated with replacement and construction activities for tactical infrastructure in the USBP Tucson Sector. This ESP also includes a summary of best management practices (BMPs) that have been developed to help CBP avoid, minimize, and mitigate for potential environmental impacts, and will guide the planning and execution of the Project.

This ESP is organized into 14 chapters plus appendices. **Chapter 1** provides a general description of the Project, discusses the background of USBP, identifies the goals and objectives of the Project, explains the stakeholder outreach process, and provides an overview of BMPs. **Chapter 2** provides a detailed description of the Project. **Chapters 3** through **11** identify potential environmental impacts that could occur within each resource area. **Chapter 12** contains an analysis of related projects and potential effects. **Chapter 13** provides a list of references used to develop the ESP, and **Chapter 14** provides a list of abbreviations and acronyms used in the ESP. Finally, the appendices include other information pertinent to the development of the ESP.

Going forward, this ESP will guide CBP's efforts in the USBP Tucson Sector, as well as demonstrate CBP's commitment to environmental stewardship during the construction and replacement of the international border fence between the U.S. and Mexico.

### 1.2 U. S. BORDER PATROL BACKGROUND

The mission of the USBP is to detect and prevent cross-border violators (CBVs), terrorists, and terrorist weapons from entering the U.S. and prevent illegal trafficking of people and contraband.

To achieve effective control of our nation's borders, CBP uses a multi-prong approach including a combination of personnel, technology, and infrastructure, the mobilization and rapid deployment of people and resources, and the fostering of partnerships with other law enforcement agencies. CBP must ensure that tactical infrastructure functions as intended, which includes meeting the following mission requirements:

- Establishing substantial probability of apprehending terrorists and their weapons as they attempt to illegally enter between Ports of Entry (POE);
- Deterring illegal entries through improved enforcement; and
- Detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.

CBP's USBP administration is divided into nine different sectors, each responsible for border operations between the U.S. and Mexico within their respective AORs. The Project falls within the USBP Tucson Sector AOR.

### 1.3 GOALS AND OBJECTIVES OF THE PROJECT

The purpose of the Project is to aid CBP in fulfilling its mission to detect and prevent CBVs, terrorists, and terrorist weapons from entering the U.S. and therefore achieve effective control of our nation's borders. The Project will help to deter illegal entries within the USBP Tucson Sector by improving enforcement efficiency, thus putting USBP in a better position to prevent terrorists and terrorist weapons, CBVs, drugs, and other contraband from entering the U.S., while also contributing to a safer work environment for USBP agents and the public.

### 1.4 STAKEHOLDER OUTREACH

CBP has consulted with numerous stakeholders regarding the Project. Stakeholders with interest in the region include the following:

- ***Department of the Interior.*** CBP has coordinated with the Department of the Interior (DOI) regarding design features, potential impacts from the Project, and potential conflicts with DOI's planning goals.
- ***Bureau of Land Management.*** CBP has coordinated with the Bureau of Land Management (BLM) regarding design features, potential impacts from the Project, and potential conflicts with BLM's planning goals.
- ***National Park Service.*** CBP has coordinated with the National Park Service (NPS) regarding potential impacts on NPS-managed land and the resources therein, including Organ Pipe Cactus National Monument (OPCNM) and Coronado National Monument.
- ***U.S. Fish and Wildlife Service.*** CBP has coordinated with the U.S. Fish and Wildlife Service (USFWS) to identify listed species that have the potential to occur in the Project Area, as well as to evaluate potential impacts on USFWS-managed land and resources,



including Cabeza Prieta National Wildlife Refuge (CPNWR) and San Bernardino National Wildlife Refuge (SBNWR).

- ***U.S. Section of the International Boundary and Water Commission.*** CBP has coordinated with the U.S. Section of the International Boundary and Water Commission (IBWC) to ensure that any construction along the U.S./Mexico border does not adversely affect International Boundary Monuments or substantially impede floodwater conveyance within international drainages.
- ***U.S. Environmental Protection Agency.*** CBP has coordinated with the U.S. Environmental Protection Agency (USEPA) to obtain feedback regarding, among other things, potential mitigation opportunities for unavoidable impacts, should mitigation be necessary, and to ensure appropriate Storm Water Pollution Prevention Plan (SWPPP) guidelines are implemented.
- ***U.S. Army Corps of Engineers.*** CBP has coordinated all activities with the U.S. Army Corps of Engineers (USACE) to identify potential jurisdictional Waters of the U.S., including wetlands, and to develop measures to avoid and minimize impacts on such resources.
- ***Arizona Game and Fish Department.*** CBP has coordinated with the Arizona Game and Fish Department (AGFD) regarding potential impacts on species within their jurisdiction.
- ***Arizona State Historic Preservation Office.*** CBP has coordinated with the Arizona State Historic Preservation Office (AZSHPO) regarding the protection and preservation of historic resources.
- ***State and Local Governments.*** CBP notified various state and local government officials regarding the Project.
- ***Tribes.*** CBP has notified and coordinated with various tribes regarding the Project, including the Ak-Chin Indian Community, Cocopah Tribe, Gila River Indian Community, Pascua Yaqui Tribe, Quechan Tribe, San Carlos Apache Tribe, and Tohono O'odham Nation.

## 1.5 BEST MANAGEMENT PRACTICES

It is CBP's policy to reduce impacts through the sequence of avoidance, minimization, and mitigation. BMPs vary based on location and resource type. Both general BMPs and species- and habitat-specific BMPs have been developed during the preparation of this ESP. CBP may also implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. Project impacts will be documented during construction and assessed through monitoring after Project construction is complete. CBP's mitigation assessment will be based on, among other things, feedback from environmental monitors and the final construction footprint.

The following sections describe those measures that may be implemented to reduce or eliminate potential adverse impacts on specific aspects of the human and natural environment. Many of these measures have been incorporated by CBP as standard operating procedures based on past projects. Below is a summary of BMPs for each resource category that will be potentially affected. The BMPs have been coordinated with the appropriate agencies and land managers or administrators.

### **1.5.1 General Design BMPs**

The design-build contracts for the Project include design performance measures aimed at avoiding impacts prior to any construction. Designs will be evaluated regarding their ability to avoid and otherwise minimize environmental impacts by incorporating the following design BMPs:

- Maximum use of existing roads for construction access.
- Lands and roads disturbed by temporary impacts repaired/returned to pre-construction conditions.
- Early identification and protection of sensitive resource areas to be avoided.
- Restoration of grades, soils, and vegetation in temporarily disturbed areas.
- On-site retention of stormwater and runoff.

### **1.5.2 Air Quality**

Measures will be incorporated to ensure that emissions of particulate matter less than or equal to 10 microns in diameter (PM<sub>10</sub>) do not significantly impact the environment. Such measures include dust suppression methods to minimize airborne particulate matter generated during construction activities. Standard construction BMPs, such as minimized diesel idling and routine watering of the construction site and access roads, will be used to control fugitive dust emissions during the construction phases of the Project. Additionally, all construction equipment and vehicles will be maintained in good operating condition to minimize exhaust emissions.

### **1.5.3 Noise**

All Occupational Safety and Health Administration (OSHA) requirements will be followed by the contractor. The blasting contractor will provide further analysis of blasting techniques and measures to be taken to ensure negligible impacts from the blasting. Construction equipment will possess properly working mufflers and will be properly tuned to reduce backfires.

### **1.5.4 Geological Resources**

Vehicular traffic associated with the construction, maintenance, and repair activities will remain on established roads to the maximum extent practicable. A SWPPP will be prepared prior to construction activities, and BMPs described in the SWPPP will be implemented to reduce erosion. Areas with highly erodible soils will be given special consideration when designing the Project to ensure incorporation of various BMPs, such as silt fences, straw bales, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion. Materials such as gravel or topsoil will be obtained from existing developed or previously used sources and not from undisturbed areas adjacent to the Project Area.

Erosion-control measures, such as water bars, gabions, straw bales, and revegetation, will be implemented during and after construction activities. Revegetation efforts will be needed to ensure long-term recovery of the area and to prevent soil erosion problems.

### 1.5.5 Water Resources

To address stormwater runoff issues, CBP will address the potential for sedimentation and erosion with appropriate BMPs. A SWPPP will be adopted and implemented by contractors performing work on the Project, which will also include BMPs to reduce potential stormwater erosion and sedimentation effects on local drainages.

The changing of oil, refueling, and other actions that could potentially result in a release of a hazardous substance should be restricted to designated staging areas that are a minimum of 100 feet from any surface drainage. Such designated areas should be surrounded with berms, sandbags, or other barriers to further prevent the accidental spill of fuel, oil, or chemicals. Any accidental spills should be immediately contained, cleaned up, and properly disposed.

Recycled water will be used for dust suppression to the maximum extent possible. Water tankers will not discard unused water where it has the potential to enter any aquatic or marsh habitat. Water storage within the Project Area should be maintained in open water ponds that are not covered and in closed, on-ground containers in upland areas, not in washes. Pumps, hoses, tanks, and other water storage devices will be cleaned and disinfected.

All engineering designs and subsequent hydrology reports will be reviewed by USIBWC prior to the start of construction activities so that the results of those activities do not increase, concentrate, or relocate overland surface flows into the U.S. or Mexico.

### 1.5.6 Biological Resources

The following summary of general and species-specific biological BMPs will be implemented, which are referenced in more detail in the Biological Survey Report (BSR) prepared for the Project (see **Appendix A**). This list has been ordered to follow a typical construction sequence and discusses species- and habitat- specific BMPs at the end. BMPs were developed in coordination with USFWS.

#### 1.5.6.1 Biology General Measures Prior to Construction

Contractors will mark designated travel corridors with high visibility, removable or biodegradable markers, and minimize construction traffic through the corridor. No activities, ground disturbance, vegetation removal, or trimming will occur outside of the marked designated work area.

#### 1.5.6.2 General Biology Measures During Construction

Protection of cacti and suitable habitat must be stressed in environmental education for contractors involved in the construction or maintenance of the Project. .

If construction or clearing activities are scheduled during the nesting season (typically February 15-September 15), the Government will perform a pre-construction survey for migratory bird

species to identify active nests prior to the start of any construction or clearing activity. If construction activities will result in the disturbance or harm of a migratory bird, coordination with USFWS and AFGD will be required. Buffer zones around active nests will be established until nestlings have fledged and abandoned the nest.

Within the portion of the Project Area that is in or near the San Pedro Riparian National Conservation Area (NCA) and Black Draw in SBNWR, contractors will install yellow rope to designate work areas associated with construction that must be maintained in good repair until work is completed within the drainages. For all in-water work in streams, sediment barriers must be used to avoid downstream effects of turbidity and sedimentation.

CBP will provide monitors for environmental and cultural resources throughout the duration of the construction contract.

### **1.5.6.3 Measures for Wildlife and Aquatic Resources**

Areas that are hydro-seeded for temporary erosion-control measures must use only native plant species appropriate to surrounding habitat types. Removal of trees and brush in federally listed species habitats will be limited to the smallest amount needed to meet contract requirements.

Transmission of disease vectors and invasive non-native aquatic species can occur via vehicle contamination (e.g., seeds brought into the area on truck tires). To prevent this, crossing of streams or marsh areas with flowing or standing water must be avoided, and when unavoidable, the vehicle will be sprayed with a 10% bleach solution after the crossing and before entering a new watershed.

Light poles and other pole-like structures will be designed to discourage roosting by birds, particularly ravens or other raptors.

To prevent wildlife species entrapment during construction, all excavated, steep-walled holes or trenches more than 2 feet deep must be covered by plywood at the close of each working day or provided with one or more escape ramp. Each morning before the start of construction and before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. Any animals discovered must be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by the Government biologist. Additionally, all vertical bollards that are hollow must be covered to prevent wildlife entrapment. Bollards should be covered from the time they are erected to the time they are filled.

### **1.5.6.4 Measures for Protected Species and Critical Habitats**

Prior to ground-disturbing activities or vegetation removal or trimming, a qualified biologist will present an environmental awareness program to all personnel who will be on site. The program will contain, at a minimum, information regarding species including the Southwestern Willow Flycatcher, Yellow-billed Cuckoo, Northern Mexican gartersnake, Chiricahua Leopard frog, Beautiful Shiner, Yaqui Catfish, Yaqui Chub, San Bernardino Springsnail, Mexican Spotted owl, Jaguar, Ocelot, Sonoran Pronghorn, Sonoran Desert Tortoise, Huachuca Water-umbel, and Cochise Pincushion Cactus. This will include general species identification, habitat description, species sensitivity to human activity, and a discussion of measures to avoid and protect the species during construction. Following the education program, photographs of the species must be posted

in the office of the contractor and resident engineer, where they will remain throughout the duration of the Project. The contractor is responsible for ensuring that employees are aware of the listed species.

To eliminate attraction of predators to protected animals, all food-related trash items such as wrappers, cans, bottles, and food scraps must be disposed in closed containers and removed daily from the Project site.

Water will not be drawn from the San Pedro River or Black Draw for construction purposes due to the presence of endangered species and critical habitat. Additionally, work will not begin at the San Pedro River or Black Draw prior to the completion of the pre-construction surveys and/or threatened and endangered species relocations. CBP will be notified to complete surveys and relocations for threatened and endangered species no less than 20 days prior to the scheduled work being completed.

If surface waters or surface flows are present in the work area near the San Pedro River or Black Draw, any listed or native fish, reptile, or amphibian within the work area must be removed and relocated by a qualified biologist to a location outside of the Project Area, preferably within the same watercourse, as identified by CBP and the appropriate land managing agency.

In areas of riparian vegetation, the size of the Project work area must be minimized to the extent possible. Vegetation within critical habitat or sensitive areas identified for removal and preservation must be clearly marked both in the field and on design plans, and otherwise communicated in the field to all workers.

A qualified biologist must be present at all times while work is ongoing within the San Pedro Riparian NCA and Black Draw within SBNWR. In the event flows enter the active construction area, the qualified biologist will determine if additional exclusionary measures or species relocations need to take place.

When an individual of a federally listed species is found within the Project limits, work must cease in the area of the species. Any threatened and endangered species or species of concern must not be harmed, harassed, or disturbed to the extent possible by Project activities. Work may resume when the individual moves away on its own, or when a Government biologist safely removes the individual. Individuals of federally listed species found in the Project Area and requiring relocation will be relocated by the Government biologist.

All on-site workers must check under their parked vehicles and equipment prior to driving to ensure there is not a desert tortoise sheltering underneath the vehicle or equipment. If found, the desert tortoise must be allowed to move out from under the vehicle or equipment on its own or a biological monitor must be contacted to relocate the individual before the vehicle or equipment can be moved.

Erosion-control products containing mesh or netting with an opening ¼-inch width or greater within 600 feet of the Quitobaquito Springs and nearby drainage will not be used, due to the potential presence of the Northern Mexican gartersnake.

### **1.5.7 Cultural Resources**

All construction will be restricted to previously surveyed areas. Any known cultural resources must be clearly flagged for avoidance during construction. CBP will be contacted to complete any necessary flagging efforts for cultural resource avoidance prior to ground-disturbing activities taking place. Should any archaeological artifacts or human remains be found during construction, all ground-disturbing activities in the vicinity of the discovery must stop, and the contractor must immediately notify the contracting officer. Work will not resume until receipt of clearance by a qualified archaeologist.

### **1.5.8 Hazardous Materials and Wastes**

All fuels, waste oils, and solvents will be collected in tanks or drums within a secondary containment system. The refueling of machinery will be completed following accepted guidelines, and all vehicles will have drip pans during storage. All spills will be contained immediately using an absorbent (e.g., granular, pillow, sock) to absorb and contain the spill. Any spill of a hazardous or regulated substance will be immediately recorded by the contractor and reported to the monitor onsite. A Spill Prevention, Control, and Countermeasure Plan (SPCCP) will be implemented as part of the Project.

### **1.5.9 Potential Avoidance and Mitigation for Unavoidable Impacts**

If unavoidable impacts result from Project construction, CBP may implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. CBP will assess the actual impacts from the Project after it is complete. CBP's assessment will be based on, among other things, feedback from environmental monitors and the final construction footprint.

## 2. DESCRIPTION OF THE PROJECT

### 2.1 LOCATION

CBP will improve and maintain 63 miles of fence along the United States/Mexico international border in Arizona. The new primary pedestrian fence is within CBP's Tucson West and East sectors along Cochise and Pima counties, Arizona (Sections 1A, 2, 1B, 3A, 3B, and 3C) The westernmost segments of the Project Area (1A, 2, 1B) occur within the USBP Tucson Sector, specifically Pima County. Segment 1, Section 1A begins approximately 2 miles west of the Lukeville POE and continues west approximately 30 miles. Section 1B begins approximately 3 miles east of the Lukeville POE and continues east approximately 8 miles. Segment 2 stretches from approximately 2 miles west of the Lukeville POE to approximately 3 miles east of the Lukeville POE. The easternmost segment occurs within the USBP Tucson Sector, specifically Cochise County. Segment 3 begins approximately 18 miles west of the Naco POE and continues approximately 25 miles east of the Douglas POE (or approximately 5 miles west of the Arizona/New Mexico state line).

Segment 1 includes the replacement of two separate sections of vehicle barriers. The first section (1A) spans 30 miles and the second section (1B) spans approximately 8 miles across Pima County. Segment 2 includes approximately 5 miles of primary pedestrian fence replacement in Pima County. Segment 3 includes three sections of non-contiguous vehicle barrier replacement spanning approximately 20 miles across Cochise County. The first section of the segment (3A) is approximately 0.2 miles in length; the second section (3B) is approximately 0.3 miles in length; the third section (3C) is approximately 19.2 miles in length. **Table 2-1** lists location data for each segment and section and **Figures 2-2** through **2-4** show each segment. **Appendix B** shows the segments in more detail.

The construction corridor is the width of the Roosevelt Reservation, the 60-foot-wide strip of land owned by the Federal Government along the U.S. side of the U.S./Mexico border in California, New Mexico, and Arizona. In some areas of difficult terrain, the corridor will be extended to 150 feet wide to provide additional room for construction equipment.

### 2.2 DESIGN

The current design features a 30-foot, bollard-style fence composed of 6-inch diameter steel bollards spaced center to center 10 inches apart, forming a 4-inch gap between each bollard. The design also includes small animal wildlife passages, approximately 8 inches by 11 inches with locations to be determined in coordination with USFWS and BLM. Additionally, gates that are installed will be of an agreed upon design to accommodate heavy runoff at Black Draw, Silver Creek, and Hay Hollow in Tucson 3 (see **Figure 2-4**) as well as other predetermined washes along the 63-mile corridor. The construction corridor will be 60 feet wide with some exceptions up to

**Table 2-1. Segment Location Data**

Segment	Section	Latitude	Longitude
Segment 1	Section 1A Start	32.038278	-113.331716
	Section 1A End	31.890032	-112.850162
	Section 1B Start	31.8648	-112.76757
	Section 1B End	31.823911	-112.634298
Segment 2	Section 2 Start	31.889999	-112.850162
	Section 2 End	31.8648	-112.76757
Segment 3	Section 3A Start	31.333754	-110.253863
	Section 3A End	31.333767	-110.250286
	Section 3B Start	31.334154	-110.152548
	Section 3B End	31.334137	-110.147464
	Section 3C Start	31.333995	-109.453305
	Section 3C End	31.332759	-109.129344

150 feet wide in areas of difficult terrain. The majority of the corridor has previously been disturbed. The Project also includes repairs and improvements to the existing patrol road, and installation of a fiber-optic cable for communications, LED lighting, and electrical utilities to supply power to the communications cable and lighting. Border security lighting will illuminate the Project Area to allow for construction at night. In those areas where border security lighting is not present, mobile light poles will be used during nighttime construction. It is anticipated that existing access roads will be used for the Project. The access roads were previously used in 2008 when the vehicle and pedestrian fencing was constructed under a previous DHS secretarial waiver. An ESP and an Environmental Stewardship Summary Report (ESSR) were completed in 2008 to support vehicle and pedestrian fence construction.

## 2.3 CONSTRUCTION ACCESS, MATERIALS DELIVERY, AND STAGING

The new bollards will be delivered to fabrication yards in Lukeville and Douglas as well as laydown areas adjacent to the Roosevelt Reservation and fabricated prior to installation. Each panel will be 8- to 10-foot-wide and composed of eight to 10, 6-inch-square (5/16-inch thick) Core-10 steel bollards filled with cement and welded in place by a horizontal steel bar on the bottom and an approximately 5-foot-wide steel sheet across the top. The steel bollards will be spaced 4 inches apart to allow for cross-border visibility. Each panel is estimated to weigh approximately 3,500 pounds, excluding any below ground materials or concrete.

The staging areas will store large equipment, house construction materials, establish batch plants for mixing concrete, and act as fabrication yards for panel assembly. Access to the Project Area is granted via existing roads within the Project Area wherever possible, including federal, state, county, and local roads.



Figure 2-1. Project Overview Map

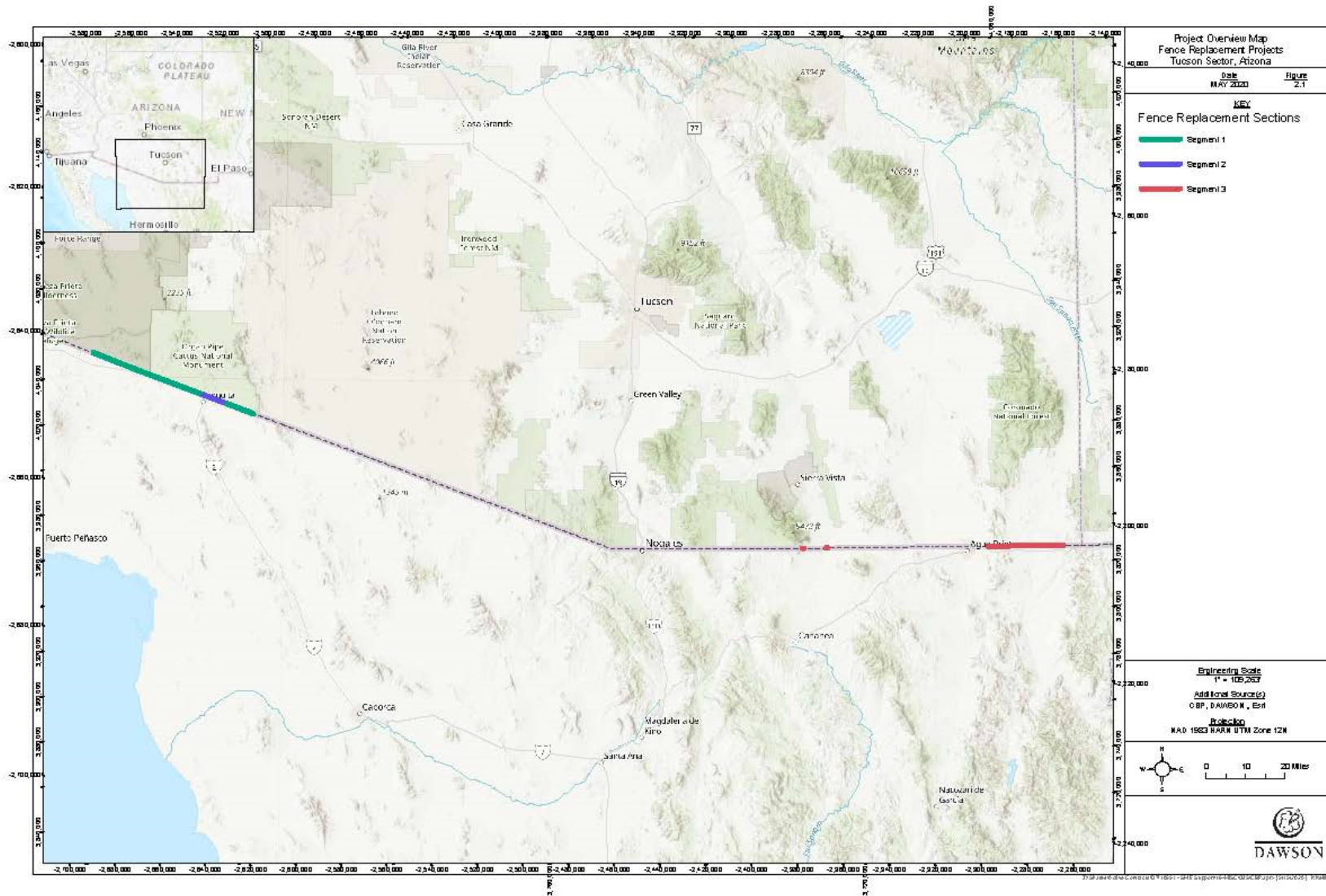


Figure 2-2. Location Map - Tucson Project 1

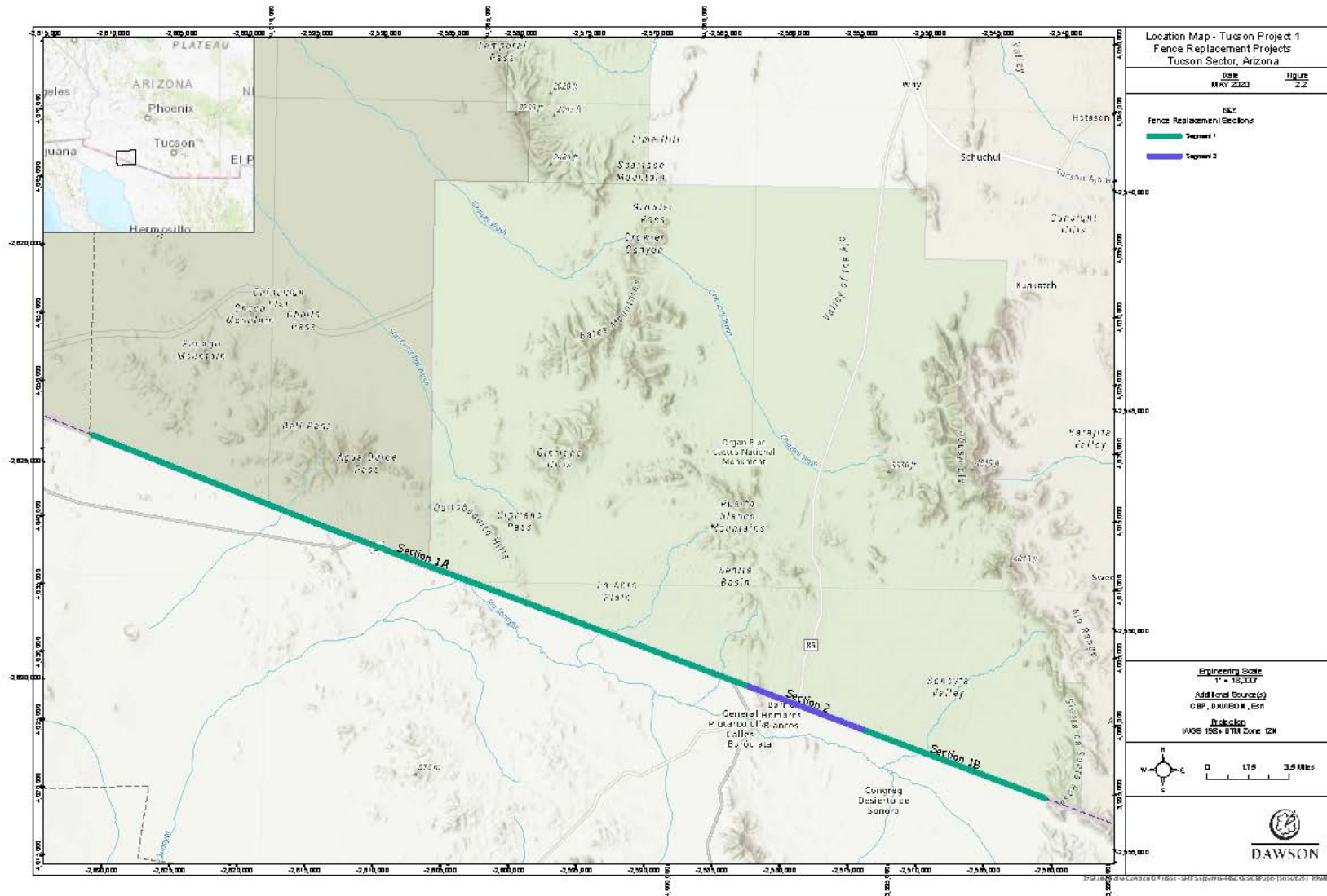


Figure 2-3. Location Map – Tucson Project 2

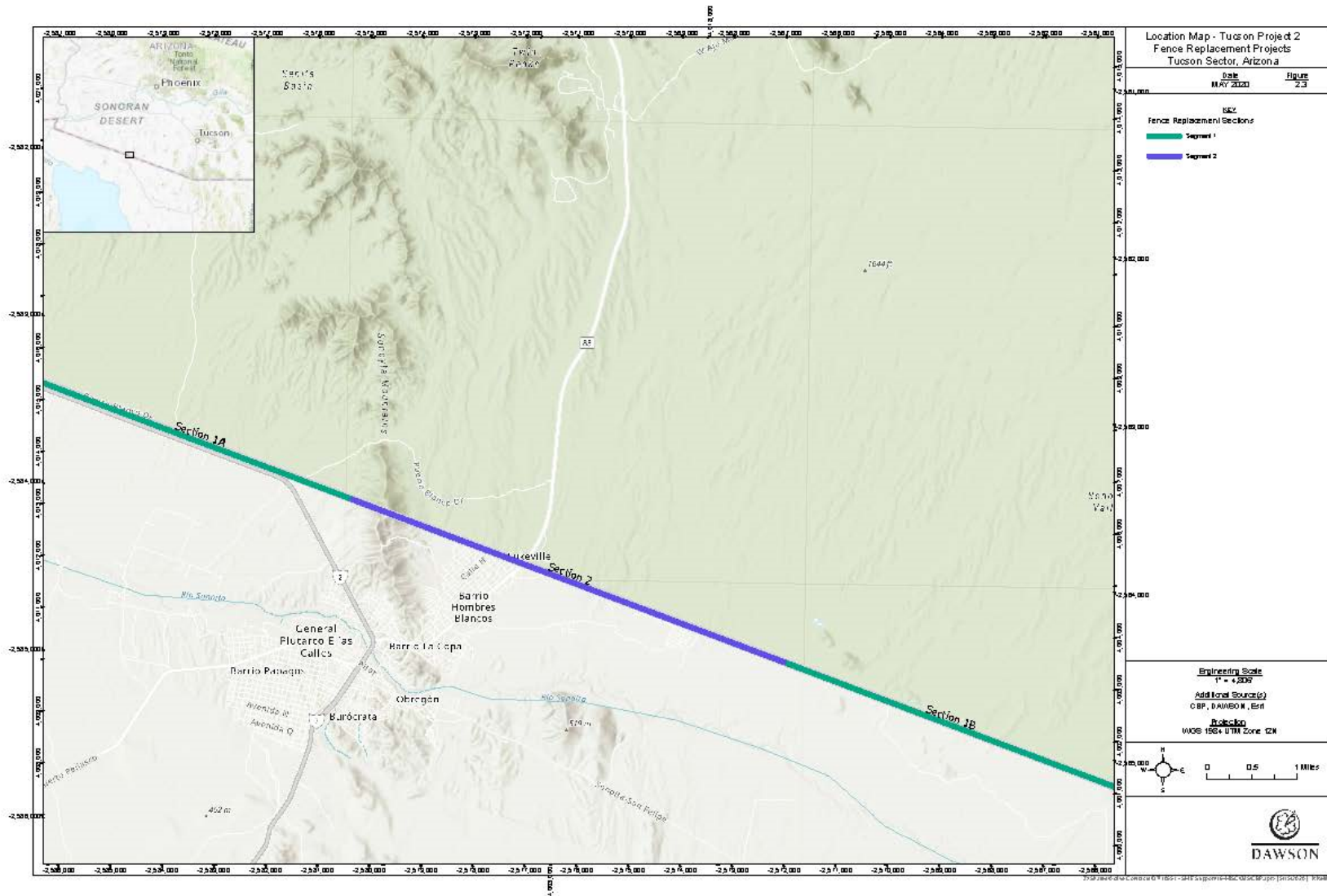
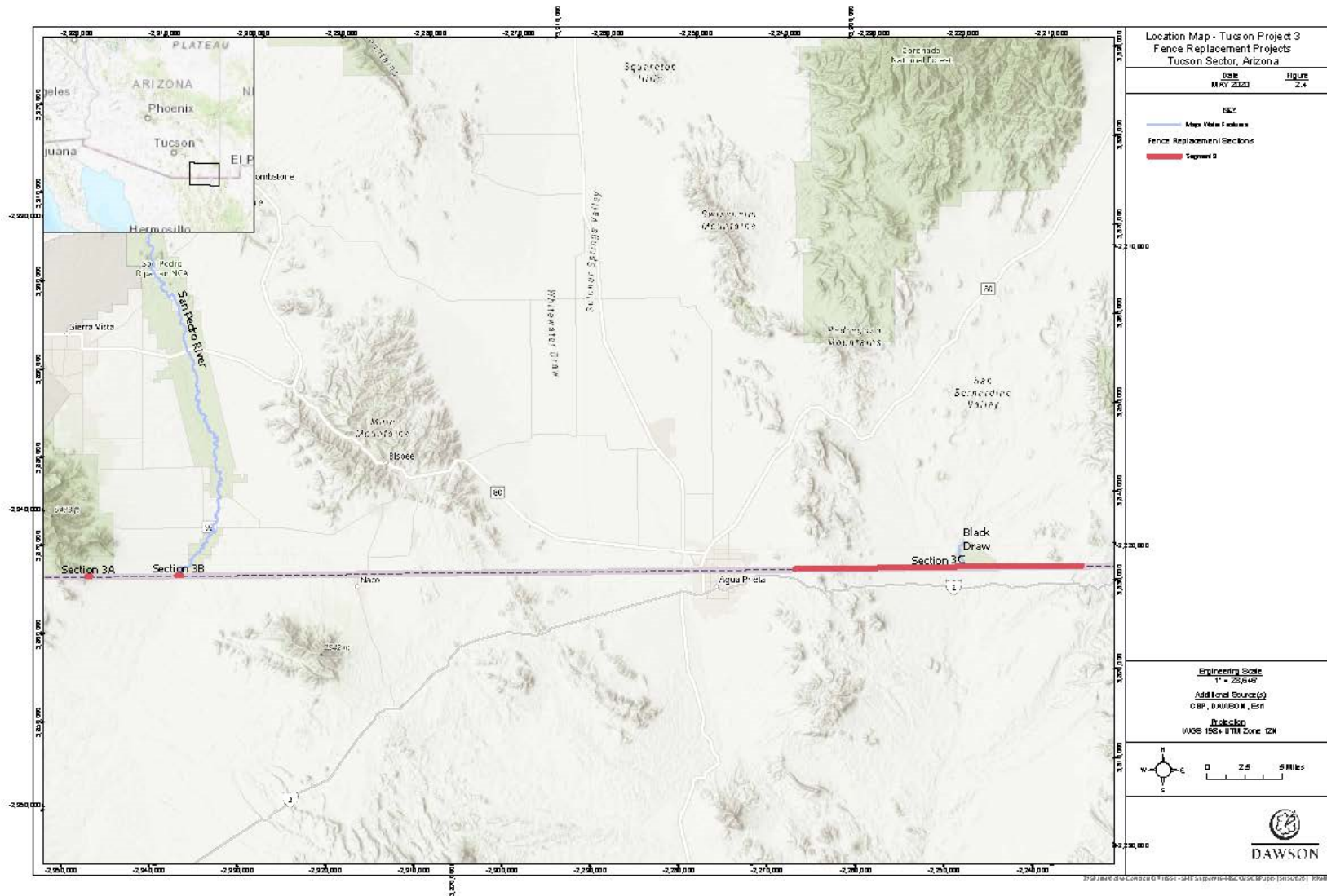




Figure 2-4. Location Map – Tucson Project 3



## 2.4 SITE PREPARATION

Site preparation primarily consists of grading staging areas which will be located in previously disturbed areas whenever possible, including areas previously used for vehicle fence construction. Erosion-control measures will be necessary, as will biological surveys, if construction takes place during the nesting season (from February 15 through September 15 every year). BMPs will limit impacts on all resources including wildlife, botanical, cultural, and other resources. Specific BMPs will be implemented prior to and during construction activities to ensure minimal disturbance within the Project Area.

All activities associated with implementation of the Project have been designed pursuant to the constraints identified in the BSR prepared for the Project (see **Appendix A**). These constraints to on-site preparation and construction ensure impacts on the biological resources present are minimized to the extent practicable.

## 2.5 REMOVAL AND REPLACEMENT OF LEGACY FENCE WITH BOLLARD WALL

The removal of the legacy fence and installation of the bollard wall will be conducted in sections. As each section of the existing legacy fence is removed, a new section of bollard wall will be installed. Each new section of bollard wall will be placed into position and secured below ground. Heavy equipment anticipated to be used during legacy fence removal and bollard wall construction consists of water trucks, impact pile drivers, loaders, bulldozers, excavators, and cranes. Disposal or recycling of the existing legacy fence will be the responsibility of the construction contractor. Once the bollard wall is installed, the Project Area will be returned to conditions similar to those currently existing.

## 2.6 CONSTRUCTION SCHEDULE

Construction is expected to last from August 22, 2019 to December 30, 2021. The total duration for the Project is 496 days. It is anticipated that construction will occur seven days per week from 7:00 a.m. to 7:00 p.m., with some exceptions where work may be scheduled 24 hours per day.

## 2.7 ENVIRONMENTAL CONSIDERATIONS

**Chapters 3 through 11** address numerous environmental factors to be considered during final design and implementation of the Project.

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## 3. AIR QUALITY

### 3.1 AFFECTED ENVIRONMENT

Pursuant to the DHS Secretary's waiver, CBP no longer has any specific legal obligations under the Clean Air Act (CAA). However, CBP recognizes the importance of environmental stewardship and has applied the appropriate standards and guidelines associated with the CAA as the basis for evaluating potential environmental impacts and implementing appropriate BMPs in regard to air quality.

Air quality is defined by the concentration of various pollutants in the atmosphere at a given location. Under the CAA, the six principal pollutants defining air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), suspended particulate matter (PM) (measured less than or equal to 10 microns in diameter [PM<sub>10</sub>] and less than or equal to 2.5 microns in diameter [PM<sub>2.5</sub>]), and lead. CO, SO<sub>2</sub>, lead, and some particulates are emitted directly into the atmosphere from emissions sources. O<sub>3</sub>, NO<sub>2</sub>, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) emissions are used to represent O<sub>3</sub> generation because they are precursors of O<sub>3</sub>.

**Federal Air Quality Standards.** The USEPA established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public. Ambient air quality standards are classified as either primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in **Table 3-1**.

Areas that are and have historically been in compliance with NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis (the process used to determine whether a federal action meets the requirements of the General Conformity Rule) are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

The USEPA designates portions of Pima and Cochise counties as moderate non-attainment areas for PM<sub>10</sub>. The Project Area is within the designated non-attainment portions – Douglas Station in Cochise County and Ajo Station in Pima County.

**Table 3-1. National Ambient Air Quality Standards**

Pollutant	Primary Standard Level	Primary Averaging Time	Secondary Standard Level	Secondary Standard Averaging Time
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>(1)</sup>	None	None
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>(1)</sup>	None	None
Lead	0.15 µg/m <sup>3</sup> <sup>(2)</sup>	Rolling 3-month Average	Same as Primary	Same as Primary
	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary	Same as Primary
Nitrogen Dioxide	53 ppb <sup>(3)</sup>	Annual (Arithmetic Average)	Same as Primary	Same as Primary
	100 ppb	1-hour <sup>(4)</sup>	None	None
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour <sup>(5)</sup>	Same as Primary	Same as Primary
Particulate Matter (PM <sub>2.5</sub> )	12.0 µg/m <sup>3</sup>	Annual (Arithmetic Average) <sup>(6)</sup>	15.0 µg/m <sup>3</sup>	Annual (Arithmetic Average) <sup>(6)</sup>
	35 µg/m <sup>3</sup>	24-hour <sup>(7)</sup>	Same as Primary	Same as Primary
Ozone	0.075 ppm (2008 std)	8-hour <sup>(8)</sup>	Same as Primary	Same as Primary
	0.070 ppm (2015 std)	8-hour <sup>(9)</sup>	Same as Primary	Same as Primary
	0.12 ppm	1-hour <sup>(10)</sup>	Same as Primary	Same as Primary
Sulfur Dioxide	75 ppb <sup>(11)</sup>	1-hour	0.5 ppm	3-hour

Source: USEPA 2019a

Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb - 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m<sup>3</sup>), and micrograms per cubic meter of air (µg/m<sup>3</sup>).

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

(2) Final rule signed October 15, 2008.

(3) The official level of the annual NO<sub>2</sub> standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard

(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).

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

(6) To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

(7) 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/m<sup>3</sup> (effective December 17, 2006).

(8) 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).

(9) 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 0.070 ppm (effective December 28, 2015).

(10) (a) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

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

(11)(a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.



### 3.2 ENVIRONMENTAL CONSEQUENCES

Temporary and minor increases in air pollution have the potential to occur during construction. The construction phase has the potential to generate air pollutant emissions as a result of transporting materials, grading, compacting, trenching, pouring concrete, and other various activities. Soil disturbance has the potential to contribute to increased fugitive dust emissions and could be greatest during the initial site preparation. Increased PM emissions from vehicles and other activities also have the potential to contribute to increased air pollution. Levels of fugitive dust have the potential to vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions (e.g., wind speed and direction, precipitation). The following paragraphs describe the air calculation methodologies used to estimate air emissions produced by the Project.

USEPA’s Motor Vehicle Emission Simulator (MOVES) model was used to calculate emissions from construction equipment. Combustion emission calculations were made for standard construction equipment, such as front-end loaders, excavators, bulldozers, cranes, and cement trucks. Assumptions were made regarding the total number of days each piece of equipment will be used and the number of hours or miles per day each type of equipment will be used. Fugitive dust emissions were calculated using the emission factor of 0.22 ton per acre per month (Air Force Civil Engineer Center 2018).

Construction workers have the potential to temporarily increase combustion emissions in the airshed during their commute to and from the Project Area. Emissions from delivery trucks also have the potential to contribute to the overall air emission budget. Emissions from delivery trucks and construction worker commuters traveling to the job site were also calculated using the MOVES model.

**Table 3-2** provides a summary of emissions from the Project and a determination of their significance. The total emissions from construction activity is demonstrated to be below the significance threshold levels of all emissions except for PM<sub>10</sub>. The working assumption for calculating emissions is that all construction activity is to be completed within a single year. In reality, the construction timeline is anticipated to span at least two years, which would result in lower emissions values. Therefore, the Project would likely have no significant impact on ambient air quality. Construction personnel will continue to implement dust control measures, including watering roads, to maintain appropriate air quality levels. Air emissions calculations are provided in **Appendix C**.

**Table 3-2. Total Air Emissions from Project versus the de minimis Threshold Levels**

Type of Emission	VOCs	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Project Emissions (tpy)	0.92047	3.65933	3.05881	0.00924	15.11537	148.53450
Significance Threshold for Nonattainment Areas (tpy)	50	100	100	100	Moderate: 100 Serious: 70	Moderate: 100 Serious: 70

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## 4. NOISE

### 4.1 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as unwanted sound, which can be based on objective effects (i.e., hearing loss, damage to structures, etc.) or subjective judgments (e.g., community annoyance). Human response to increased sound levels varies according to the type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day (for noise impacts on wildlife see **Chapter 8.2.2**). How an organism responds to the sound source determines whether the sound is judged as pleasing or as an annoying noise, or if it disturbs a normal behavior. Sound is usually represented on a logarithmic scale quantified in decibel (dB) units. Sound on the dB scale is referred to as a sound level. The threshold of human hearing is near 0 dB, and the threshold of discomfort or pain is around 120 dB.

Nighttime noise levels are generally viewed as a greater community annoyance than the same levels occurring during the day. It is generally given that people perceive a nighttime noise at 10 A-weighted decibels (dBA) louder than when that same noise is experienced during the day. This perception occurs largely because background environmental sound levels at night, in most areas, are also approximately 10 dBA lower than those during the day. As such, nighttime noise levels are often perceived as intrusive more often than the same noise level during the day. Below is a summary and definition of noise levels based on the U.S. Department of Housing and Urban Development noise program.

**Acceptable** (not exceeding 65 dB) – This noise exposure could be of some concern, but common building construction makes the indoor environment acceptable and the outdoor environment reasonably pleasant for recreation and play.

**Normally Unacceptable** (above 65 but not greater than 75 dB) – The noise exposure is significantly more severe; barriers could be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building construction could be necessary to ensure that people indoors are sufficiently protected from outdoor noise.

**Unacceptable** (greater than 75 dB) – The noise exposure at the site is so severe that the construction costs to make the indoor noise environment acceptable could be prohibitive and the outdoor environment will still be unacceptable.

Generally, noise generated by a stationary noise source, or “point source,” will decrease by approximately 6 dBA over hard surfaces and 9 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, that noise level will be 79 dBA at a distance of 100 feet from the noise source, 73 dBA at a distance of 200 feet, and so on.

**Table 4-1** depicts noise emissions levels for construction equipment, which range from 68 dBA to 104 dBA at 100 feet from the source (FHWA 2007).

**Table 4-1. A-Weighted Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances from Source**

Noise Source	100 feet	200 feet	500 feet	1,000 feet	2,000 feet	3,000 feet
	dBA	dBA	dBA	dBA	dBA	dBA
Backhoe	72	66	58	52	46	43
Crane	75	69	61	55	49	46
Dump truck	70	64	56	50	44	41
Excavator	75	69	61	55	51	48
Front-end loader	73	67	59	53	47	44
Concrete mixer truck	73	67	59	53	47	44
Pneumatic tools	75	69	61	55	49	46
Auger drill rig	78	72	64	58	52	49
Bulldozer	76	70	62	56	50	47
Generator	75	69	61	55	49	46
Impact pile driver	104	98	90	84	78	75
Flatbed truck	68	62	54	48	42	39

Source: FHWA 2007 and GSRC

Notes: The dBA at 50 feet is a measured noise emission (FHWA 2007).

Results based on GSRC modeled estimates.

Under the Noise Control Act of 1972, OSHA established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period (OSHA 2018). The highest allowable sound level to which workers can be constantly exposed is 115 dBA; exposure to this level must not exceed 15 minutes within an 8-hour period (OSHA 2018) The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that reduce sound levels to acceptable limits.

For open space areas, the Federal Highway Administration (FHWA) noise regulations define a *de minimis* threshold. This regulation defines open space lands as “land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.” The open space areas, as defined, have a *de minimis* threshold of 57 dBA (23 CFR 722, Table 1).

The Project Area is divided into three sections that span 63 miles across southern Arizona. The Project Area is located in a primarily rural area with portions within 1,000 feet of recognized conservation areas and national monuments, such as CPNWR, SBNWR, OPCNM, and the San Pedro Riparian NCA. The majority of the Project will occur in a remote area, consisting of open desert and mountains. There are no other sensitive noise receptors, including churches, schools, or hospitals within 1,000 feet of Project Area.

## 4.2 ENVIRONMENTAL CONSEQUENCES

Noise within the Project Area has the potential to be created during the transportation of construction materials, operation of construction equipment, and numerous construction activities. Noise levels to receptors vary widely depending on several factors, such as climatic and soil conditions, topography, the equipment condition, and current ambient noise levels. Open space areas that are less developed have a lesser ambient noise level than developed areas, making it much easier for an adverse noise impact to result in an open space area.

Installation of the replacement bollard fence and construction of the all-weather road are anticipated to be completed in segments; therefore, construction noise has the potential to be temporary and only occur near work being performed. Additionally, most of the noise generated by the Project has the potential to occur during construction, and thus is not likely to contribute to ambient noise levels. Routine maintenance of the fence and roads has the potential to result in slight temporary increases in noise levels that could continue to sporadically occur over the long-term and have the potential to be similar to those of ongoing road maintenance within the Project Area. Using a worst-case scenario of 104 dBA, the noise model predicts that noise emissions from the impact pile driver (proposed construction equipment) will have to travel 3,000 feet before attenuating to levels below 75 dBA. The area encompassed within the 2,000 feet (78 dBA) noise contour does not include sensitive receptors. Thus, the noise generated by the construction and maintenance of Project infrastructure has the potential to have a minor adverse effect.

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## 5. LAND USE, RECREATION, AND AESTHETICS

### 5.1 AFFECTED ENVIRONMENT

#### 5.1.1 Land Use and Recreation

The majority of the Project will occur within the Roosevelt Reservation, a 60-foot-wide reservation immediately north of the United States/Mexico border that was set aside for border security uses. CBP operations and tactical infrastructure construction within the Roosevelt Reservation, which is consistent with the purpose of the Reservation. The Project traverses the Lukeville POE, as well as various rural areas (including ranch land and wilderness) of Pima and Cochise counties. The landscape within the Project Area is generally undisturbed, consisting of open desert and mountains, with the exception of the existing barrier fence and patrol roads. A small portion of the Project Area is also identified for recreational use, including but not limited to hiking, hunting, camping, horseback riding, wildlife viewing, and biking.

Additionally, portions of the Project Area are federally owned by USFWS (CPNWR and SBNWR), NPS (OPCNM and Coronado National Memorial), and BLM (San Pedro Riparian NCA) (USGS 2020). **Table 5-1** summarizes land ownership within the Project Area.

**Table 5-1. Land Ownership within Project Area**

Owner	Project Acreage	Agency	Designation Type	Name
Bureau of Land Management	1.06	Federal	National Conservation Area	San Pedro Riparian National Conservation Area
Bureau of Land Management	56.12	Federal	Not Specified	N/A
National Park Service	2.56	Federal	National Memorial	Coronado National Memorial
National Park Service	308.69	Federal	National Monument	Organ Pipe Cactus National Monument
U.S. Fish and Wildlife Service	62.43	Federal	National Wildlife Refuge	Cabeza Prieta National Wildlife Refuge
U.S. Fish and Wildlife Service	13.45	Federal	National Wildlife Refuge	San Bernardino National Wildlife Refuge
U.S. Federal Government	452.36	Federal	Federal Land	Roosevelt Reservation

Source: USGS 2020

The San Pedro Riparian Area, containing approximately 40 miles of the upper San Pedro River, was designated by Congress as an NCA on November 18, 1988, to protect and enhance the desert riparian ecosystem. Areas providing recreational opportunities are available within the NCA, such as Murray Springs, the Spanish Presidio Santa Cruz de Terrenate, and San Pedro House (BLM 2020). The NCA is managed by BLM.

The Coronado National Memorial, which is managed by NPS, commemorates Francisco Vásquez de Coronado’s expedition of 1540–1542, the first organized expedition by Europeans into the U.S.

Coronado entered what is now Arizona along the San Pedro River Valley, a few miles east of the memorial, then continued north along a route marked today as the Coronado Trail (NPS 2020b). The memorial site offers several hiking trails through the foothills of the Huachuca Mountains.

OPCNM, located immediately southeast of CPNWR, is managed by NPS and is the only place in the world where the organ pipe cactus grows wild. Along with the organ pipe, many other types of cacti and desert flora native to the Yuma desert section of the Sonoran Desert region grow in the park. The monument was declared a Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization in 1976. In 1977, 95% of Organ Pipe Cactus was declared a wilderness area (NPS 2020a).

CPNWR, which is managed by USFWS, spans 56 miles along the United States/Mexico border and was originally established in 1939 to provide safe habitat for bighorn sheep (*Ovis canadensis*). Today, the refuge is home to more than 275 different species of animals and nearly 400 species of native plants. Cabeza Prieta is the third largest national wildlife refuge in the lower 48 states (NPS 2020c).

SBNWR was established in 1982 to protect what remained of the unique wetlands of the San Bernardino Cienega, a wetland that was historically considered the largest, most extensive in the region. This large USFWS-managed marsh serves as a migratory corridor for wildlife in the mountain ranges of Mexico, which extend into Arizona (USFWS 2020).

### 5.1.2 Aesthetics

Aesthetic resources consist of natural and man-made landscape features that give a particular environment its visual characteristics. The Project segments are within areas previously disturbed by prior fence and road construction and USBP law enforcement activities. Very little natural vegetation is present within the Project Area; however, 68 total plant species were documented within the Project Area during surveys.

## 5.2 ENVIRONMENTAL CONSEQUENCES

### 5.2.1 Land Use and Recreation

All replacement fence will be constructed within the footprint of existing barrier fence which falls within the Roosevelt Reservation. Therefore, land use will remain the same in areas where the Project replacement fence falls within the Reservation. Land use has the potential to change, however, in areas where the Project Area extends beyond the Reservation which ends 60 feet from the border.

Impacts on recreation have the potential to occur within CPNWR, SBNWR, OPCNM, Coronado National Memorial, and San Pedro Riparian NCA. Such impacts could potentially include the temporary closure during construction of certain areas that the public uses for recreational purposes. Temporary closure of these areas has the potential to result in decreased public access to land for activities such as hiking, hunting, camping, horseback riding, wildlife viewing, and biking.



## 5.2.2 Aesthetics

The existing border barriers that are to be replaced as a part of the Project consist of vehicle and pedestrian fence. Vehicle fence stands 3- to 4- feet high in the form of either Normandy fences, metal posts that resemble large X's cabled together, or picket fences, vertical metal posts just tall enough to keep out a car. The existing pedestrian fence is made of landing mat, which is a solid metal, and stands 12- to 18- feet high.

The existing pedestrian fence is solid, but the replacement bollard fence will include small gaps, allowing for individuals to see through to the other side, thus potentially having a beneficial impact on the appearance of the landscape. The transparent qualities of the bollard fence also allow for USBP agents to see through the fence, which has the potential to be beneficial in an operational sense and for anyone else wishing to view the broader landscape across the border. Additionally, the bollard fence will be 18- to 30- feet tall, which is four to eight feet taller than the current 12-foot pedestrian fence and 15- to 27-feet taller than the current 3-foot vehicle fence. While the bollard fence has the potential to be significantly more visually obstructive than the existing pedestrian and vehicle fences, it could potentially be considered less of a visual impediment than the existing pedestrian fence which is solid metal.

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## 6. GEOLOGICAL RESOURCES AND SOILS

### 6.1 AFFECTED ENVIRONMENT

Geology is the study of Earth's composition and provides information on the structure and configuration of surface and subsurface features. Soils are the unconsolidated materials overlying bedrock or other parent material. Differences among soil types in terms of their structure, elasticity, strength, water absorption potential, and erosion potential affect the ability to support certain applications or uses.

**Regional Geology.** The Project Area is in the Basin and Range Province of the southwestern United States. The topography of the province consists of north-to-south-oriented ranges that alternate with flat lying valleys (Scott 2012). The terrain in southeastern Arizona is characterized by large amounts of normal faulting and many alluvial fans. The arid climate in the region prevents runoff from transporting sediment far distances, which results in the formation of the alluvial fans. Western portions of Arizona, especially near Yuma County, are near existing active faults in southern California and experience high seismic potential. Central and eastern areas along the border are seismically quiet (AZGS 2020).

The Sonoran Desert, which encompasses southeastern Arizona, is characterized by broad, low-elevation valleys rimmed by long, thin, parallel mountain ranges (Arizona-Sonora Desert Museum 2020). Mountaintops range from 3,000 feet in the west to 10,000 feet in the east. The elevations of valley bottoms rise from sea level in the southwest to 5,000 feet in southeastern Arizona, where deserts are replaced by grassland valleys (Arizona-Sonora Desert Museum 2020).

**Soils.** Arizona has a diverse assortment of soil types throughout the state, with variations in depth, texture, chemical properties, and appropriate land uses. This diversity is directly related to regional differences in climate, parent material, topography, and erosion actions. The Project Area consists primarily of well-drained soils that range from very fine sandy loam to gravelly loam to clay loam (see **Table 6-1**). All the soils in the Project Area are classified as “not prime farmland” (NRCS Undated).

Soil runoff potential is determined by a number of different soil properties and site characteristics, which can be generalized by saturated hydraulic conductivity and slope. Most of the soil in the Project Area has moderate to high hydraulic conductivity values, which means the soil has adequate capacity to transmit water. Therefore, in this case, runoff potential is primarily determined by the slope. Sections of the Project Area that have flatter slopes — ranging between 0% and 5% — experience lower runoff potential. Sections with steeper slopes — 8% or higher — experience higher runoff potential.

### 6.2 ENVIRONMENTAL CONSEQUENCES

Impacts on geology and soils are considered adverse if they alter the lithology (i.e., the character of a rock formation), stratigraphy (i.e., the layering of sedimentary rocks), and geological structures that dictate groundwater systems, change the soil composition, structure, or function within the environment, or increase the risk of geological hazards.

**Table 6-1. Soil Characteristics of Project Area**

Project Segment	Soil Type	Profile	Slope	Runoff Potential
Segments 1 and 2	Antho fine sandy loam	Well drained, fine sandy loam	0 to 3%	Very low
	Gilman very fine sandy loam, saline	Well drained, very fine sandy loam	0 to 3%	Low
	Growler-Antho complex	Well drained, sandy loam	0 to 2%	Very low
	Gunsight very gravelly loam	Well drained, very gravelly loam	0 to 2%	Low
		Well drained, very gravelly loam	2 to 15%	Medium
	Harqua very cobbly loam	Well drained, very cobbly loam	0 to 8%	High
	Harqua-Gunsight complex	Well drained, very gravelly loam	0 to 3%	Low
	Lomas extremely stony loam	Well drained, extremely stony loam	8 to 40%	High
	Perryville very cobbly fine sandy loam	Well drained, very cobbly fine sandy loam	0 to 8%	Medium
Torrifluvents	Excessively drained	0 to 5%	N/A	
Segment 3	Blakeney-Luckyhills complex	Well drained, fine sandy loam	3 to 15%	High
	Cherrycow-Magoffin-Rock outcrop complex	Moderately well drained, sandy loam	15 to 65%	Very high
	Chorro-Guest complex	Well drained, clay loam	0 to 3%	Low
	Elgin-Outlaw complex	Well drained, sandy loam	1 to 10%	Medium
	Elgin-Stronghold complex	Well drained, very gravelly sandy loam	3 to 20%	High
	Eloma sandy loam	Well drained, gravelly loam	1 to 10%	Medium
	Guest-Riveroad association	Well drained, fine sandy loam and clay	0 to 1%	Low
	Kahn Zapolote complex	Well drained, clay loam	1 to 15%	High
	Luckyhills-McNeal complex	Well drained, very gravelly sandy loam	3 to 15%	Medium
	Mabray-Chiricahua-Rock outcrop complex	Well drained, cobbly loam	3 to 45%	Very high
	Mabray-Rock outcrop complex	Well drained, extremely cobbly loam	3 to 45%	Very high
	Outlaw-Epitaph-Paramore complex	Well drained, clay loam	0 to 15%	High
Riveroad and Ubik soils	Well drained, loam	0 to 5%	Low	

Source: NRCS Undated

Note: Natural Resources Conservation Service (NRCS) does not provide published data for the western portion of Section 1A of Segment 1.

**Regional Geology.** Short- and long-term, moderate, adverse impacts on topography have the potential to occur from earthmoving and grading activities during construction. Topography has the potential to be altered using drill-and-shoot excavation and other ground-leveling techniques to provide flat surfaces for the construction of the pedestrian and vehicle barriers, ancillary support facilities and structures, and access roads.

**Soils.** Approximately 23 acres of soil have the potential to be temporarily affected; however, the soils within the Project Area have already been permanently impacted by previous fence and all-weather patrol road construction. Therefore, short-term, minor, adverse impacts on soils have the potential to result from further disturbance of ground surfaces, earthmoving activities, and grading within the proposed disturbance area during construction. These activities would excavate soils and expose rock materials, temporarily remove vegetation in some areas, and expose soils to erosion.

In general, accelerated erosion of soils has the potential to be short-term and minimized by appropriately siting and designing facilities to take into account soil limitations, employing construction and stabilization techniques appropriate for the soil and climate, and implementing BMPs and erosion control measures. BMPs include the installation of silt fencing and sediment traps, application of water to disturbed soil to reduce dust, grading of staging areas, and re-vegetation of disturbed areas as soon as possible following ground disturbance, as appropriate. Pre- and post-construction BMPs have been developed and will be implemented to reduce or eliminate erosion and potential downstream sedimentation.

The potential exists for petroleum, oil, and lubricants (POLs) to be spilled during refueling of the construction equipment, adversely impacting soils; however, drip pans will be placed under all staged equipment, and secondary containment will be used when refueling equipment. A SWPPP and SPCCP have been prepared prior to construction activities and BMPs described in these plans will be implemented to reduce potential erosion and contamination.

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## 7. HYDROLOGY AND WATER MANAGEMENT

### 7.1 AFFECTED ENVIRONMENT

Hydrology and water management relate to natural and man-made water resources that are available for use by, and for the benefit of, humans and the environment. Evaluation of hydrology and water resources examines the quantity and quality of the resource and its demand for various purposes.

Hydrology concerns the distribution of water-to-water resources, including surface waters and groundwater, through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Groundwater consists of subsurface hydrologic resources and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater features include depth from land surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations. Surface water includes natural, modified, and constructed water confinement and conveyance features located above groundwater that could have a defined channel and discernable water flows. These features are generally classified as streams, springs, wetlands, natural and artificial impoundments (e.g., ponds, lakes), and constructed drainage canals and ditches.

#### 7.1.1 Groundwater

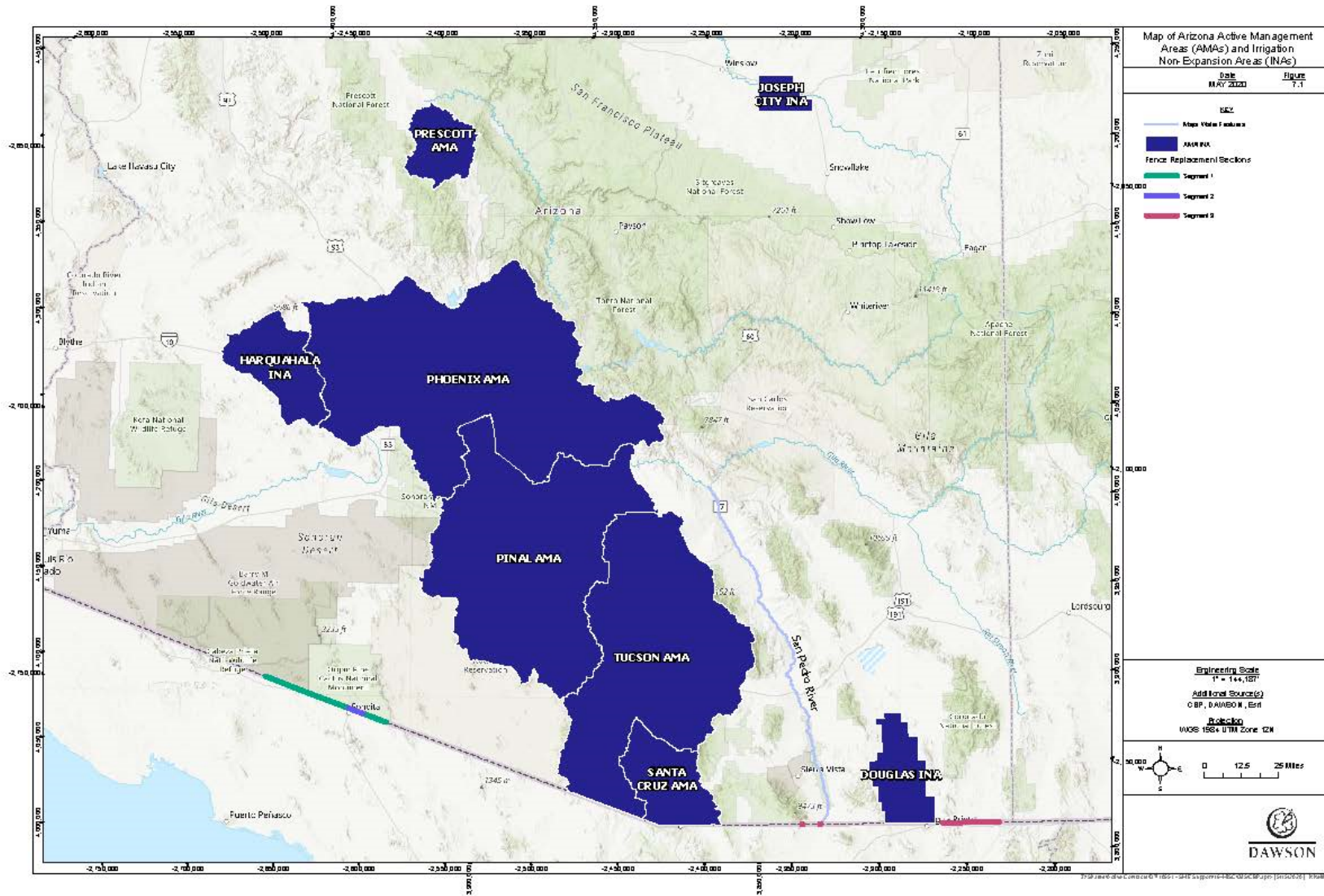
**Arizona Water Management.** In 1980, Arizona implemented the Groundwater Management Code (Code) to manage the state's groundwater resources to support the growing economy. The goals of the Code are to control severe overdrafting, efficiently allocate the state's current resources, and augment water supply development. The Code designated areas that require moderate water management provisions as Irrigation Non-Expansion Areas (INAs). There are three recognized INAs in Arizona: Douglas, Joseph City, Harquahala. Areas that experienced severe overdrafting were designated as Active Management Areas (AMAs). The Code recognized five AMAs in Arizona: Prescott, Phoenix, Pinal, Tucson, and Santa Cruz. The AMAs include 80% of Arizona's population and 70% of the state's groundwater overdraft (ADWR Undated). Each AMA carries out its programs in a manner consistent with the goals of the Code while considering and incorporating the unique character of each AMA. The Project does not transverse any AMA or INA in Arizona (see **Figure 7-1**).

The construction contractor is required to report water withdrawals from wells within the Roosevelt Reservation or public lands. Prior to drilling new wells or using existing ones, the contractor is required to receive approval for all proposed well locations from CBP. In order to use private wells, the contractor must receive permission from the individual landowner.

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Figure 7-1. Map of Arizona Active Management Areas and Irrigation Non-Expansion Areas



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**Groundwater in the Project Area.** Segments 1 and 2 of the Project are in the Western Mexican Drainage groundwater basin, near the Lower Gila basin. Segment 3 of the Project is in the Upper San Pedro, Douglas, and San Bernardino groundwater basins.

The Western Mexican Drainage groundwater basin composes 610 square miles within Yuma and Pima counties in southwestern Arizona. The basin composes a thin strip of land, approximately 15 miles wide, along the international boundary with Mexico. The majority of the Western Mexican Drainage groundwater basin lies within Mexico. The basin is composed of unconsolidated gravel, sand, silt and clay deposits. Groundwater flow is from north to south into Mexico, with an estimated yield of 2,400 acre-feet crossing the border annually. Well yields are less than 100 gallons per minute (GPM), with a median well yield of approximately 50 GPM. Recharge is estimated to average 1,000 acre-feet per year. There are an estimated 3.0 to 4.1 million acre-feet in storage in the basin (ADEQ 2017a). The Lower Gila basin composes 7,309 square miles, encompassing most of southwestern Arizona. The groundwater within the basin is generally unconfined. The middle fine-grained basin-fill unit typically only produces enough water for low-yield stock and domestic wells. Groundwater in most areas of the basin is not suitable for drinking water use without treatment (ADEQ 2017b).

The Upper San Pedro groundwater basin spans 1,825 square miles primarily across Cochise County in southeastern Arizona and extends into northern Mexico. The groundwater within the basin is generally unconfined and is found above land surface (flowing wells) to more than 500 feet below surface at basin perimeter (ADEQ 2012). The basin receives inflows from mountain-front recharge and stream infiltration with minor underflow.

The Douglas groundwater basin covers 950 square miles in southeastern Arizona and northern Mexico. Groundwater within the aquifer generally flows toward the center of the valley and then south toward Mexico (ADEQ 1999). The main drainage is Whitewater Draw. The Douglas basin shares many similar characteristics with the Upper San Pedro basin, as the groundwater is also unconfined and could be up to 500 feet below surface. Mountain-front recharge could contribute up to 20,000 acre-feet of inflow per year.

The San Bernardino groundwater basin includes approximately 387 square miles in the extreme southeastern corner of Arizona within Cochise County. The basin extends about 35 square miles into New Mexico and about 400 square miles into Mexico. The basin is generally unconfined and is characterized by thin layers of sand and gravel interbedded with basalt flows. Groundwater flows from the mountains toward the center of the valley and then to Mexico. Annual transboundary discharge is approximately 5,545 acre-feet. Groundwater depths range from less than 200 feet to more than 600 feet below surface (ADEQ 2011).

### 7.1.2 Surface Water and Waters of the United States

**Segments 1 and 2.** Segments 1 and 2 of the Project Area are in a Sonoran Desert climate, which averages 7.7 inches in annual precipitation and becomes more arid towards the west. All the channels in Segments 1 and 2 are ephemeral (CBP 2020c) and their flow and formation are typically related to intense thunderstorm events. Ephemeral streams are episodic stream channels that appear to convey flows only during and immediately after precipitation events. The majority

of channels are formed on broad alluvial fans along with some hillslope areas. As the topography becomes steeper going to the west, channels are generally more confined in a valley.

Segment 1A also contains Quitobaquito Springs - a shallow waterbody located in the southwest corner of OPCNM about 200 yards from the international border with Mexico. The half-acre spring sources its water from a fault in the adjacent Quitobaquito hills. Known for its cultural and natural significance in the desert environment, Quitobaquito Springs is home to a number of sensitive species described in detail in **Chapter 8.1**.

**Segment 3.** Segment 3 of the Project Area is in a region where ecosystems are primarily transitional between Chihuahuan Desert Scrub and Semidesert Grassland, with elements from the Madrean Evergreen Woodland, Sonoran Desert, and Arizona Upland Subdivision. The channels present in this region primarily depend on runoff from intense monsoon thunderstorms during the summer months. All channels in Segment 3 are ephemeral with the exception of Black Draw, a perennial stream, located towards the eastern end of the Project. Black Draw is a tributary to the Bavispe River which eventually flows into the Gulf of California in Mexico.

The channel in Segment 3A is a tributary to the San Pedro River. Segment 3B is on the San Pedro River, which flows north from Mexico. Channels in the western portion of Segment 3C are small tributaries to the Agua Prieta, which flows into the Yaqui River. The eastern portion of Segment 3C has tributaries that flow south into the Rio San Bernardino, which also connects to the Yaqui River.

**Waters of the United States.** USACE regulates “Waters of the United States” under Section 404 of the Clean Water Act (CWA). Waters of the U.S. are defined in the CFR as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “non-wetland waters” and are characterized by an Ordinary High Water Mark (OHWM). Non-wetland waters generally include lakes, rivers, streams, and other open-water habitats.

The Project Area contains 14.26 acres of potentially jurisdictional non-wetland waters that are categorized into ephemeral and perennial streams (see **Table 7-1**) (CBP 2020c). Many of these channels display an OHWM. The ephemeral streams are not considered to be connected to traditional navigable waters that flow year-round or seasonally up to a period of three months. One perennial stream was identified as part of the jurisdictional assessment within Segment 3C. Black Draw is a perennial spring-fed system and was found to have standing water during the time of the survey and flows south across the international border.

The Project Area contains 0.09 acres of jurisdictional wetland waters (see **Table 7-1**). The Black Draw drainage is a freshwater wetland and had standing water at the time of the survey. Another wash in Segment 3, Hay Hollow, is mapped as a wetland in the National Wetlands Inventory but did not have standing water within the Project Area at the time of survey (USFWS 2019b). No wetland areas are present in Segments 1 and 2 of the Project Area (USFWS 2019b). The complete Waters of the U.S. delineation report is provided in **Appendix D**.

**Table 7-1. Waters of the United States Project Area Survey**

Potentially Jurisdictional Waters	Acres
<b>Non-Wetland Waters</b>	
Ephemeral Streams	14.21
Perennial Streams	0.05
<b>Wetland Waters</b>	
Ephemeral Wetlands	0.04
Perennial Wetlands	0.05

**Segments 1 and 2.** A survey of Segments 1 and 2 of the Project Area delineated 10.73 acres and identified 334 ephemeral channels (CBP 2020c). The channels generally flow from north to south into Mexico. Starting from the western end of Segment 1 and heading east for 10.8 miles, there were 93 channels that flow towards the El Pinacate Volcanic Shield where they appear to end in a dry lakebed. These channels do not appear to connect to any traditional navigable waters and do not have a significant nexus to any traditionally navigable waters. The remaining channels in Segments 1 and 2 are tributaries to the Rio Sonoyta in Mexico. Rio Sonoyta is an intermittent stream in Mexico that contains endangered species and is also connected to the Gulf of California that could have once been navigable. All channels in Segments 1 and 2 could be considered jurisdictional waters since they flow across the border and can be interpreted to be interstate waters.

**Segment 3.** A survey of Segment 3 delineated 3.53 acres, which includes 69 washes or bosque areas surveyed (CBP 2020c). Channels in Segment 3 generally flow from north to south, though there are a few that flow north. Segment 3A has two channels that drain south across the border into Mexico where they enter the San Pedro River. The San Pedro, located in Segment 3B, flows north and is a tributary to the Gila River. Both the tributaries and the mainstem of the San Pedro could be considered jurisdictional waters because they connect to the Gila River, a traditionally navigable water. All the channels surveyed cross the international boundary and therefore could be defined as interstate waters and would be jurisdictional under CWA. All washes in Segment 3 are ephemeral with the exception of Black Draw in Segment 3C.

### 7.1.3 Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body.

Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities, such as hospitals, schools, or storage buildings for irreplaceable records, inherently pose too great a risk to be in either the 100- or 500-year floodplain. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

Floodplains are protected under EO 11988, Floodplain Management, which requires federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the Project Area to nearby floodplains. If a federal agency action encroaches within the floodplain and alters the flood hazards designated on a FIRM (e.g., changes to the floodplain boundary), an analysis reflecting any changes must be submitted to the FEMA. EO 11988 directs federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988 outlined in the FEMA document Further Advice on EO 11988 Floodplain Management.

All construction activities near the floodplain should be coordinated with the Floodplain Manager for the area FEMA office.

## **7.2 ENVIRONMENTAL CONSEQUENCES**

### **7.2.1 Groundwater**

The potential exists for groundwater contamination resulting from road improvements or fence installation to be negligible with the implementation of SWPPP measures and the natural filtration of soils overlying the aquifers in the Project Area. The potential for groundwater quality to be permanently impacted as a result of the Project is not anticipated.

The Project requires water from the local supply for road construction, including pouring concrete and cut-and-fill operations and fugitive dust suppression during construction activities. There is potential for the Project to have temporary, minor to moderate adverse impacts on the local water supply. However, the potential for this temporary demand to have a permanent impact on the local water supply, which is drawn from a diverse set of water sources, is not anticipated. CBP works with USACE and the construction contractor to monitor groundwater usage for the project. If local groundwater pumping is found to have an adverse effect to aquatic, marsh, or riparian dwelling threatened and endangered species, treated water from outside the immediate area must be utilized. Water not lost to evaporation during watering of road surfaces during construction has the potential to contribute to aquifer recharge through downward seepage.

### **7.2.2 Surface Water and Waters of the United States**

Construction of the proposed barrier system has the potential to result in minor, short-term, adverse impacts on surface waters, including jurisdictional waters. Black Draw, a perennial stream in Segment 3C, has the potential to experience temporary dewatering during barrier construction. During the dewatering process, the water will be removed and temporarily piped around the construction area. Temporary dewatering could be applied to other washes in the Project Area, such as Hay Hollow and the San Pedro River, if water is present at the time of construction. All temporary impacts will be restored to pre-Project contours following Project completion.

During construction, there is a potential for sediment and other contaminants to be introduced to surface waters and ultimately impact downstream water quality. Chemical or petroleum spills

have the potential to result in short-term, direct impacts on surface waters. However, implementation of typical stormwater protection BMPs and spill prevention and management plans have the potential to reduce or eliminate permanent, adverse impacts on the water quality of surface waters.

**Quitobaquito Springs.** BMPs for the Project specify that the construction contractor will not drill new wells or use existing wells within five miles of Quitobaquito Springs. NPS plans to monitor water levels at the springs to evaluate and identify significant changes.

### 7.2.3 Floodplains

A review of FIRM for Cochise and Pima counties in Arizona and incorporated areas shows that Segments 1 and 2 of the Project Area do not occur within a 100-year floodplain (FEMA 2020). The segments are within an area mapped as Zone D, which is defined by FEMA as “areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted (FEMA 2011).” Segments 3A and 3C are within an area mapped as Zone X, which is defined as “areas determined to be outside the 0.2% annual chance floodplain (FEMA 2011).”

Almost the entire portion of Segment 3B, 0.3 miles, is within the 100-year floodplain. The permanent footprint for the fence replacement along the 0.3-mile stretch has the potential to be approximately 60 feet wide, equal to 0.22 acres. Some potential impacts of the border fence include increased risk of flooding due to increased runoff velocities, potentially obstructed waterways, slightly reduced infiltration, and possibly minimal reductions in groundwater recharge. CBP will coordinate with the construction contractor to consider these impacts and develop a barrier design that allows for continuous water flow and minimizes debris build-up during flood events.

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## 8. BIOLOGICAL RESOURCES (VEGETATION, WILDLIFE, AQUATIC SPECIES, SPECIAL STATUS SPECIES)

### 8.1 AFFECTED ENVIRONMENT

As described in previous sections, the Project Area is generally located in southern Cochise and Pima counties near the Lukeville, Naco, and Douglas POEs. The Project Area is bordered to the south by Mexico and primarily to the north by a variety of public and private lands. The majority of the Project Area has been previously disturbed during previous border activities and are managed as CBP access roads and other associated infrastructure.

A biological survey of the Project Area was conducted in July 2019 (CBP 2020a). All plant and wildlife species incidentally observed were documented. Vegetation mapping was conducted with the use of field survey data supplemented with aerial photographs. The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity to determine its potential to occur in the Project Area. For many of the species, the surveys were not conducted at the ideal time of year to identify the species or potential habitat. Biologists used their best professional judgement using the information and conditions available to make an assessment.

The Project Area includes the U.S./Mexico international border and the Roosevelt Reservation. Overall land uses north and south of the Project Area are a mix of public and urban land use, with Mexico being immediately to the south. The Project Area includes mileage along CPNWR and within OPCNM, Coronado National Memorial, SBNWR, and San Pedro Riparian NCA, as well as a small portion of private and state land trusts.

The regional climate for the western segments of the Project include hot, dry summers, and variable summer precipitation ranging between eight and 23 inches annually, as monsoonal activity is extremely variable spatially and year to year. Annual low temperatures range between 45 degrees Fahrenheit (°F) and 75°F, while high temperatures range between 65°F and 105°F.

The regional climate for the eastern segments of the Project include hot, dry summers leading into late summer monsoonal activity, followed by a moderate winter season with most of the annual precipitation falling as snow at higher elevations. Precipitation averages 14 inches annually; southeastern Arizona receives the highest precipitation rates across the state due to its proximity to the core of the monsoonal region in Mexico. Annual low temperatures range between 32°F and 68°F, while high temperatures range between 65°F and 100°F (ADWR 2019a; U.S. Climate Data 2019).

#### 8.1.1 Plants and Vegetation Communities

A total of 68 plant species were documented within the Project Area during the general biological survey; the full list can be found in **Appendix A**. Many were only identified to the genus, as the seasonal timing of the surveys did not allow for the presence of floral and herbaceous plant parts necessary for proper species identification.

The vegetation community descriptions below are based on conditions observed during the general biological survey effort. Vegetation community maps can be found in **Appendix A**.

*Acacia constricta* - *Acacia neovernicosa* Thornscrub Alliance

Approximately 6 acres of *Acacia constricta* - *Acacia neovernicosa* Thornscrub Alliance was mapped in the Project Area, in the western to middle portion of Segment 3C. In general, the alliance is characterized by whitethorn acacia (*Vachellia* [= *Acacia*] *constricta*), viscid acacia (*Vachellia* [= *Acacia*] *neovernicosa*), which is dominant or codominant in the shrub layer, with subdominant shrubs or subshrubs such as burweed (*Ambrosia* sp.), boxthorn (*Lycium* sp.), and mesquite (*Prosopis* sp.). Shrubs are typically less than seven feet tall; cover is open to intermittent. The herbaceous layer is variable, and grasses can grow dense at high elevations. Desert scrub species intermix at lower elevations.

*Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forbs Alliance

Approximately 34 acres of *Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forbs Alliance was mapped in a small patch west of the Lukeville POE in Segment 2 and found more extensively throughout Segment 3C. In Segment 3C, this alliance is mapped in a long linear strip immediately adjacent the northern road edge. Areas mapped as this alliance are typically dominated by mixed herbaceous annuals such as desert Indianwheat (*Plantago ovata*) and ruderal non-native plant species including prickly Russian thistle (*Salsola tragus*). Other co-dominant species included Mediterranean grass (*Schismus* sp.), stork's bill (*Erodium* sp.), and popcorn flower (*Cryptantha* sp.).

*Cylindropuntia bigelovii* Cacti Scrub Alliance

Approximately 0.5 acres of *Cylindropuntia bigelovii* Cacti Scrub Alliance is mapped in the Project Area within the western portion of Segment 1A. The alliance is associated with well-drained soils within rocky upland slopes and alluvial fans. Areas mapped as this alliance are typically dominated by teddybear cholla (*Cylindropuntia bigelovii*). Other co-dominant plants species include creosote bush (*Larrea tridentata*) and brittlebush (*Encelia farinosa*).

*Dasyilirion* spp. - *Bouteloua curtipendula* - *Muhlenbergia setifolia* Foothill Desert Grassland Alliance

Approximately 3 acres of *Dasyilirion* spp. - *Bouteloua curtipendula* - *Muhlenbergia setifolia* Foothill Desert Grassland Alliance is mapped across Segment 3C. The alliance is associated with semi-desert grasslands found across the foothills of the Chihuahuan Desert. Areas mapped as this alliance are typically dominated by sotol (*Dasyilirion* spp.) and perennial grasses including grama grass (*Bouteloua* spp.), curlyleaf muhly (*Muhlenbergia setifolia*), and bluestem (*Schizachyrium* sp.).

Developed/Bare Ground

Approximately 217 acres of Developed/Bare Ground was mapped across the entire Project Area. The existing access road running parallel to the international border is included in this landcover type as well as buildings and extensive areas of anthropogenic disturbance.

*Eleocharis palustris* - *Eleocharis macrostachya* Marsh Alliance

Approximately 0.5 acres of *Eleocharis palustris* - *Eleocharis macrostachya* Marsh Alliance is mapped within the middle portion of Segment 3C. The herbaceous wetland alliance surrounds the southern edge of an open water feature north of the Project Area within SBNWR. Areas mapped as this alliance are typically dominated by spikerush (*Eleocharis* spp.), sedge (*Carex* spp.), and rush (*Juncus* spp.).

#### *Encelia farinosa* Desert Scrub Alliance

Approximately 39 acres of *Encelia farinosa* Desert Scrub Alliance is mapped in the Project Area throughout Segments 1A, 2, and 1B. This shrub-dominated alliance is typically found at lower elevations (less than 3,000 ft above mean sea level [AMSL]) and found on various landforms within rocky substrate. Areas mapped as this alliance are typically dominated by variable density of brittlebush (*Encelia farinosa*) with sparse cover of creosote bush, ocotillo (*Fouquieria splendens*), buffelgrass (*Pennisetum ciliare*), and chainfruit cholla (*Cylindropuntia fulgida*).

#### *Flourensia cernua* Lowland Basin Desert Scrub Alliance

Approximately 1 acre of *Flourensia cernua* Lowland Basin Desert Scrub Alliance is mapped throughout Segment 3C. This open canopy shrub-dominated alliance is found on lowland landforms with saline soils. Areas mapped as this alliance are typically dominated by American tarwort (*Flourensia cernua*), with sparse cover of creosote bush, mesquite, and saltbush (*Atriplex* spp.)

#### *Fouquieria splendens* Chihuahuan Desert Succulent Scrub Alliance

Approximately 0.2 acres of *Fouquieria splendens* Chihuahuan Desert Succulent Scrub Alliance is mapped at the western end of Segment 3C. This succulent shrub-dominated alliance is typically found at elevations between 4,500 and 6,500 ft AMSL within rocky limestone slopes. Areas mapped as this alliance are typically dominated by variable density of ocotillo, with sparse cover of mixed low-growing shrubs and succulents.

#### *Larrea tridentata* - *Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance

Approximately 79 acres of *Larrea tridentata* - *Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance is mapped in the Project Area extensively throughout Segments 1A, 2, and 1B. This shrub-dominated alliance is found on various landforms within well-drained soils. Areas mapped as this alliance are typically dominated by variable density of creosote bush and burrobush (*Ambrosia dumosa*). Other co-dominant plants species include saltbush, desert Indianwheat, baccharis (*Baccharis* spp.), London rocket (*Sisymbrium* spp.), chainfruit cholla, prickly Russian thistle, saguaro (*Carnegiea gigantea*), ocotillo, senita (*Pachycereus schottii*), palo verde (*Parkinsonia* spp.), and buffelgrass.

#### *Larrea tridentata* Chihuahuan Desert Scrub Alliance

Approximately 18 acres of *Larrea tridentata* Chihuahuan Desert Scrub Alliance is mapped extensively throughout Segment 3C. This shrub-dominated alliance is found on various landforms within well-drained soils. Areas mapped as this alliance are typically dominated by variable density of creosote bush and burrobush. Other co-dominant plants species included saltbush (*Atriplex* spp.), desert Indianwheat, baccharis (*Baccharis* spp.), London rocket, chainfruit cholla, prickly Russian thistle, saguaro, ocotillo, senita, palo verde, and buffelgrass.

### Mixed Desert Scrub

Approximately 28 acres of Mixed Desert Scrub is mapped extensively throughout Segments 1A and 1B. This mixed shrub and tree land cover type is found on various landforms throughout the Project Area and had high diversity of various shrub and tree species without a clear dominant canopy cover. Areas mapped as this alliance are covered with a variable density of creosote bush, burrobush, saltbush, chainfruit cholla, prickly Russian thistle, saguaro, ocotillo, palo verde, and buffelgrass.

### *Parkinsonia florida* - *Olneya tesota* Desert Wash Scrub Alliance

Approximately 22 acres of *Parkinsonia florida* - *Olneya tesota* Desert Wash Scrub Alliance is mapped extensively throughout Segments 1A and 1B. This mixed tree and shrub land cover type is found within drainage systems throughout the Project Area. Areas mapped as this alliance are covered with a variable density of palo verde, ironwood (*Olneya tesota*), creosote bush, chainfruit cholla, and mesquite.

### *Populus fremontii* Great Basin Riparian Forest Alliance

Approximately 1 acre of *Populus fremontii* Great Basin Riparian Forest Alliance is mapped in the Project Area within Segment 3B. This tree-dominated land cover type is found within the San Pedro River corridor exclusively. Areas mapped as this alliance are dominated by Fremont's cottonwood (*Populus fremontii*) with scattered small trees including ash (*Fraxinus* sp.) and willow (*Salix* spp.).

### *Prosopis glandulosa* - *Prosopis velutina* - *Prosopis pubescens* Wet Scrub Alliance

Approximately 30 acres of *Prosopis glandulosa* - *Prosopis velutina* - *Prosopis pubescens* Wet Scrub Alliance is mapped throughout Segments 1A and 1B. This mixed shrub land cover type is found within drainage systems throughout the Project Area. Areas mapped as this alliance are covered with a variable density of mesquite, creosote bush, and saltbush.

### *Prosopis glandulosa* Lowland Basin Chihuahuan Desert Scrub Alliance

Approximately 17 acres of *Prosopis glandulosa* Lowland Basin Chihuahuan Desert Scrub Alliance is mapped in the Project Area throughout Segment 3C. This mixed shrub land cover type is found within drainage systems throughout the Project Area. Areas mapped as this alliance are covered with a variable density of mesquite and boxthorn with subdominants covering including ocotillo and creosote bush.

## 8.1.2 Wildlife and Aquatic Resources

Three species of fish, two species of amphibians, 13 species of reptiles, 36 species of birds, and 13 species of mammals were documented during field surveys within Pima and Cochise counties. Wildlife documented in and around the Project Area are generally typical of those found in the Sonoran Basin and Range and the Madrean Archipelago ecoregions. During field surveys in July 2019, biologists recorded all wildlife species that were incidentally observed; they are listed in **Table 8-1** below.

**Table 8-1. Wildlife Observed in Study Area**

Species Name	Common Name
<b>Fish</b>	
<i>Gila purpurea</i>	Yaqui Chub
<i>Gambusia affinis</i>	Mosquito Fish
<i>Poeciliopsis occidentalis sonoriensis</i>	Yaqui Topminnow
<b>Amphibians</b>	
<i>Lithobates catesbeiana</i>	American Bullfrog
<i>Lithobates chiricahuensis</i>	Chiricahua Leopard Frog
<b>Reptiles</b>	
<i>Aspidoscelis unipare</i>	Desert Grassland Whiptail
<i>Aspidoscelis tigris</i>	Tiger Whiptail
<i>Callisaurus draconoides</i>	Zebratail Lizard
<i>Crotaphytus collaris</i>	Eastern collared Lizard
<i>Crotaphytus nebrius</i>	Sonoran Collared Lizard
<i>Dipsosaurus dorsalis</i>	Northern Desert Iguana
<i>Gambelia wislizenii</i>	Longnose Leopard Lizard
<i>Heloderma suspectum</i>	Reticulate Gila Monster
<i>Holbrookia elegans</i>	Elegant Earless Lizard
<i>Sceloporus magister</i>	Desert Spiny Lizard
<i>Sceloporus occidentalis</i>	Western Fence Lizard
<i>Urosaurus ornatus</i>	Ornate Tree Lizard
<i>Uta stansburiana</i>	Common Side-blotched Lizard
<b>Birds</b>	
<i>Accipiter cooperii</i>	Cooper's Hawk
<i>Amphispiza bilineata</i>	Black-throated Sparrow
<i>Ardea Herodias</i>	Great Blue Heron
<i>Auriparus flaviceps</i>	Verdin
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Callipepla gambellii</i>	Gambel's Quail
<i>Callipepla squamata</i>	Scaled Quail
<i>Campylorhynchus brunneicapillus</i>	Cactus Wren
<i>Caracara cheriway</i>	Crested Caracara
<i>Cathartes aura</i>	Turkey Vulture
<i>Chondestes grammacus</i>	Lark Sparrow
<i>Circus hudsonius</i>	Northern Harrier
<i>Corvus corax</i>	Common Raven
<i>Corvus cryptoleucus</i>	Chihuahuan Raven
<i>Falco sparverius</i>	American Kestrel
<i>Geococcyx californianus</i>	Greater Roadrunner
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Melanerpes uropygialis</i>	Gila Woodpecker
<i>Melospiza melodia</i>	Song Sparrow
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Molothrus ater</i>	Brown-headed Cowbird
<i>Passerina caerulea</i>	Blue Grosbeak
<i>Phainopepla nitens</i>	Phainopepla
<i>Polioptila melanura</i>	Black-tailed Gnatcatcher

Species Name	Common Name
<i>Psaltriparus minimus</i>	Bushtit
<i>Pyrocephalus rubinus</i>	Vermilion Flycatcher
<i>Quiscalus mexicanus</i>	Great-tailed Grackle
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Sayornis nigricans</i>	Black Phoebe
<i>Setophaga coronata</i>	Yellow-rumped Warbler
<i>Spinus tristis</i>	American Goldfinch
<i>Thryomanes bewickii</i>	Bewick's Wren
<i>Tyrannus verticalis</i>	Western Kingbird
<i>Zenaida asiatica</i>	White-winged Dove
<i>Zenaida macroura</i>	Mourning Dove
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow
Mammals	
<i>Ammospermophilus harrisi</i>	Harris's Antelope Squirrel
<i>Bos Taurus</i>	Domestic Cow
<i>Chaetodopus spp.</i>	Pocket Mouse
<i>Dipodomys spp.</i>	Kangaroo Rat
<i>Lepus alleni</i>	Antelope Jackrabbit
<i>Lepus californicus</i>	Black-tailed Jackrabbit
<i>Neotoma lepida</i>	Desert Woodrat
<i>Odocoileus hemionus</i>	Mule Deer
<i>Prycyon lotor</i>	Northern Raccoon
<i>Sylvilagus audubonii</i>	Desert Cottontail
<i>Tayassu tajacu</i>	Javelina
<i>Urocyon cinereoargenteus</i>	Common Gray Fox
<i>Xerospermophilus tereticaudus</i>	Round Tailed Ground Squirrel

No invertebrate species were documented within the Project Area during the general biological survey efforts. A total of three species of fish were documented within the Project Area during the focused species surveys.

Quitobaquito Springs is a known suitable habitat for special-status species including the Quitobaquito tryonia, Quitobaquito pupfish, Sonoyta Mud Turtle, and Yuma Ridgway's Rail. Black Draw is a known suitable habitat for special-status species including Yaqui chub, Yaqui topminnow, San Bernardino springsnail, Chiricahua leopard frog, yellow-billed cuckoo, and southwestern willow flycatcher. Additionally, the San Pedro Riparian NCA supports a variety of special-status wildlife and plant species, including Huachuca water-umbel, Huachuca springsnail, Sonoran Desert Tortoise, yellow-billed cuckoo, and southwestern willow flycatcher.

### 8.1.3 Protected Species and Critical Habitat

#### 8.1.3.1 Special-status Species

A total of 10 special-status plant species, four special-status invertebrate species, nine special-status fish species, seven special-status amphibian species, 29 special-status reptile species, 52 special-status bird species, and 34 special-status mammal species have been documented to occur within 2 miles of the Project Area, defined by the AGFD HabiMap Arizona online tool (AGFD

2019). Of these, two reptile species, two bird species, and two mammal species were observed during general biological surveys of the Project Area. No invertebrate species were documented within the Project Area during the general biological survey efforts.

One special-status invertebrate species that has high potential to occur within the Project Area is the monarch butterfly (*Danaus plexippus*). Migrating monarch butterflies are likely to cross the Project Area during spring (March-June) and fall (September-November) migration (WAFWA 2019). Presence of larval host plants within the milkweed family are found throughout the Project Area.

The Sonoran collared lizard (*Crotaphytus nebrius*) and Gila monster (*Heloderma suspectum*) were both observed during general biological surveys. The Sonoran collared lizard is listed as a Species of Greatest Conservation Need (SGCN) 1B and has high potential to occur in Sonoran Desert habitats across Segments 1A, 2, and 1B. One recorded observation of Gila monster was made in Segment 3C during survey efforts and the subspecies was not noted. This observation coincides with a documented population and observations of reticulate Gila monster (*Heloderma suspectum suspectum*) in the Segment 3C Project Area. Reticulate Gila monster is listed as an SGCN 1A species and occurs in the Sonoran Desert in rocky canyon substrates and has high potential to occur across Segment 3C.

There are two special-status bird species observed during general biological surveys within the Project Area: loggerhead shrike (*Lanius ludovicianus*), and Gila woodpecker (*Melanerpes uropygialis*). The loggerhead shrike is listed as a USFWS species of concern, and suitable desert scrub habitat that could support the species occurs throughout the Project Area. Suitable desert scrub and woodlands and riparian corridors that could support the SGCN 1B-listed Gila woodpecker occur throughout the Project Area. Both bird species have high potential to occur across the entire Project Area.

There are two special-status mammal species observed during general biological surveys within the Project Area: Harris's antelope squirrel (*Ammospermophilus harrisi*) and antelope jackrabbit (*Lepus alleni*). The Harris's antelope squirrel is listed as an SGCN 1B species and is found in canyons, arid plans, and river valleys in low-elevation desert habitats. This species has high potential to occur in Segments 1A, 2, and 1B. The antelope jackrabbit is listed as an SGCN 1B species and is found in grassy slopes and thornscrub desert habitats. This species has high potential to occur throughout the entire Project Area.

### **8.1.3.2 Federal-listed Species**

Within the Project Area, two plant species, one invertebrate species, four fish species, one amphibian species, two reptile species, four bird species, and three mammal species are federally listed as endangered or threatened species under the Endangered Species Act. Species accounts and occurrence information for each federal-listed species are detailed below.

Huachuca water-umbel (*Lilaeopsis schaffneriana* ssp. *recurva*). Federal Endangered. Moderate potential to occur.

The Huachuca water-umbel is an herbaceous, semi-aquatic perennial in the parsley family with slender erect leaves that grow from the nodes of creeping rhizomes. It is found in Cienegas and

associated vegetation within Sonoran desertscrub (USFWS 2020). The Huachuca water-umbel is listed as a federally endangered species and is associated with perennial springs and slow-moving stream headwaters that have permanently or seasonally saturated soils between 2,000 and 6,500 feet AMSL.

This species occurs within the upper reaches of the San Pedro River basin and within SBNWR. This species was not observed during general or focused biological surveys throughout the Project Area within appropriate habitats. At the time of the survey, the main channel of the San Pedro River flowing within the Project Area (Segment 3B) was faster moving and would not support suitable habitat for this plant species. This species is aquatic to semi-aquatic. This species has moderate potential to occur within the Project Area because elemental occurrences are known within this river corridor north and south of Segment 3B. This species is unlikely to occur within the ephemeral Silver Creek in SBNWR (Segment 3C) because aquatic resources are not consistent enough to provide suitable habitat. The Black Draw drainage system within SBNWR (Segment 3C) has moderate potential for this species to occur because suitable aquatic conditions are present.

Cochise pincushion cactus (*Escobaria robbinsiorum*). Federal Threatened. High potential to occur.

The Cochise pincushion cactus is a small (0.5–2.4 inches in diameter), unbranched cactus scattered among several limestone hills in southeastern Cochise County, Arizona. At least one population is known from northern Sonora, Mexico. This small cactus is covered by white, cottony areoles and the radial spines overlap with the areoles, giving the cactus an overall whitish appearance (USFWS 2020). The Cochise pincushion cactus is listed as federally threatened and is known to occur in limestone soil types occurring within Segment 3C of the Project Area within SBNWR. This species was not observed during general biological survey efforts but has high potential to occur within this segment of the Project because appropriate soil types, elevation requirements (4,000 feet AMSL), and Chihuahuan Desert scrub habitat are found across Segment 3C.

San Bernardino springsnail (*Pyrgulopsis bernardina*). Federal Endangered. High potential to occur.

The San Bernardino springsnail is an aquatic springsnail that lives in Rheocrene springs, seeps, spring pools, outflows, and diverse flowing waters at elevations around 3,800 feet (USFWS 2020). Although the springsnail has no potential to occur in the Project Area, it has high potential to occur within the surrounding area, because the occupied drainage system bisects the international border. This species is known to occur in a small spring system within the privately-owned Slaughter Ranch adjacent to SBNWR.

Yaqui chub (*Gila purpurea*). Federal Endangered. Known to occur.

The Yaqui chub is listed as federally endangered and four were found during focused species surveys within SBNWR in Black Draw (CBP 2020). The Yaqui chub is a medium-sized minnow that is darkly colored, but usually lighter below. Its most pronounced feature is a dark triangular caudal spot. The species requires clean, narrow, permanent streams and spring pools, free of introduced fishes. It prefers living in deep pools of smaller streams with dense vegetation in the water (AGFD 2001a).



Yaqui topminnow (*Poeciliopsis occidentalis sonoriensis*). Federal Endangered. Known to occur.

The federally endangered Yaqui topminnow is a small, guppy-like, live bearing fish, the breeding males of which are jet black with yellow specked fins (USFWS 2020). Two hundred fifty topminnow were found during focused species surveys within SBNWR in Black Draw (CBP 2020a). This topminnow lives in shallow, warm, slow-moving waters containing thick algae and debris. It is most common in marshes, especially those fed by springs. It feeds on detritus and small bits of animal and plant material. They can tolerate a range of water temperatures from freezing to 100°F and low dissolved oxygen (AESFO 2010, AGFD 2001b).

Yaqui catfish (*Ictalurus pricei*). Federal Threatened. Moderate potential to occur.

The Yaqui catfish is a medium to large fish, the body of which is usually profusely specked (USFWS 2020). The species inhabits ponds, streams, and moderate to large rivers in areas of medium to slow current over a sand/rock bottom. This catfish is only found within the Rio Yaqui within and adjacent to SBNWR and was not observed during focused survey efforts. There is moderate potential for this species to occur within the Project Area as appropriate riverine streams and substrates are present in Segment 3C within SBNWR.

Beautiful shiner (*Cyprinella formosa*). Federal Threatened. Moderate potential to occur.

The beautiful shiner is a small, long, shiny minnow; the males are very colorful when exhibiting breeding color (USFWS 2020). The species was extirpated from its native range in the U.S. by 1970 and reintroduced into four ponds in SBNWR in 1990 (AGFD 2001c). The beautiful shiner is only known from small to medium streams within SBNWR and was not observed during focused survey efforts. There is moderate potential for this species to occur within the Project Area since appropriate low-flowing streams and substrates are present in Segment 3C within SBNWR.

Chiricahua leopard frog (*Lithobates chiricahuensis*). Federal Threatened. High potential to occur.

The Chiricahua leopard frog is known for its distinctive pattern on the rear of its thigh consisting of small, raised, cream-colored spots or tubercles on a dark background, dorsolateral folds that are interrupted and deflected medially, stocky body proportions, relatively rough skin on the back and sides, and often green coloration on the head and back. The species also has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration (USFWS 2020). This species was not detected during focused species surveys at the San Pedro River within the Project Area in Segment 3B but is considered to have high potential to occur in this segment.

One leopard frog tadpole was detected within the Project Area during focused species survey in Segment 3C (CBP 2020a). The identification of this individual to species was not possible as there is potential for hybridization with other co-occurring *Lithobates* sp. Suitable habitat occurs within Segment 3C for Chiricahua leopard frog.

Northern Mexican gartersnake (*Thamnophis eques megalops*). Federal Threatened. High potential to occur.

The northern Mexican gartersnake ranges in background color from olive to olive-brown to olive-gray. Three stripes run the length of the body with a yellow stripe down the back that darkens toward the tail. A portion of the lateral stripe occurring on the fourth scale row distinguishes it from other gartersnake species (USFWS 2020). The gartersnake is a federally threatened species

that occurs in riparian corridors. Suitable habitat for this species occurs within Segments 3B and 3C. Northern Mexican gartersnake has high potential to occur since elemental occurrences of this species have been documented near or within the Project Area.

Sonoran desert tortoise (*Gopherus morafkai*). Sensitive. High potential to occur.

The Sonoran desert tortoise ranges in length from 8 to 15 inches, with a relatively high domed shell, usually brownish with a pattern and prominent growth lines. The bottom shell is yellowish and not hinged. The hind limbs are very stocky and elephantine; forelimbs are flattened for digging and covered with large conical scales (USFWS 2020). The Sonoran desert tortoise is considered sensitive under the USFWS Candidate Conservation Agreement. This species is found on rocky slopes and the Mojave and Sonoran Deserts and has high potential to occur across Segments 1A, 2, and 1B.

Mexican spotted owl (*Strix occidentalis lucida*). Federal Threatened. Unlikely to occur.

The Mexican spotted owl is a federally threatened species that uses closed canopy forests within rocky canyons and cliffs for breeding and nesting habitat. It is a medium-sized owl with large dark eyes and no ear tufts. Plumage is brown with numerous white spots, and posterior underparts have short, horizontal bars or spots (USFWS 2020). Although this species is known to use riparian corridors for dispersal and movement, it is unlikely to occur within the Project Area.

Yuma Ridgway's Rail (*Rallus obsoletus yumanensis*). Federal Endangered. Unlikely to occur.

The Yuma Ridgway's rail is one of the smaller subspecies of the Ridgway's rail, with adults standing at about 8 inches tall. Coloring is light grey to dark brown on the upper body, a tawny-orange breast, and orange legs. The beak is long, and curves slightly downwards (USFWS 2020). The preferred habitat of the Yuma Ridgway's rail is fresh or brackish marshes and sidewaters with dense cattail (*Typha* sp.) and bulrush (*Schoenoplectus* sp.). Within this habitat, they are found at the interface between standing water and saturated soil. When the soil surface in a marsh dries out, the rail moves to a new location. The Yuma Ridgway's rail is a federally endangered species, and occurrences of this species have been recorded from Quitobaquito Springs. The spring system is approximately 165 feet north of the Project Area and this species is unlikely to occur in the Project Area.

Southwestern willow flycatcher (*Empidonax traillii extimus*). Federal Endangered. Present.

Southwestern willow flycatcher is a small, migratory bird about 6 inches long, with grayish-green back and wings, a white throat, a light gray-olive breast, and a pale yellowish belly. Two wingbars are visible and the eye ring is faint or absent (USFWS 2020). The flycatcher is a federally endangered species that uses riparian corridors for breeding, nesting, foraging, and migration movement. Suitable habitat to support breeding and foraging for this species occurs adjacent to Segment 3B in the San Pedro River; however, habitat structure within the Project Area is unlikely to support the species. One record of this species was documented within Segment 3C as this area is part of their migration corridor.

Yellow-billed cuckoo (*Coccyzus americanus*). Federal Threatened. High potential to occur.

The yellow-billed cuckoo is a slim, long-tailed bird about 12 inches in length, with a broad curved beak that is yellow at the base of the lower mandible and black on top. The long tail is grayish

brown above and strikingly marked with 6 white spots against a black background below (USFWS 2020). The cuckoo is a federally threatened species using similar habitat as the southwestern willow flycatcher, but in this region, has less restricted requirements for nesting substrates. In Arizona, the species can be found outside of the cottonwood-riparian habitats in mesquite bosques and are only transient in desert and urban habitats (AGFD 2011). The yellow-billed cuckoo is found in all counties of Arizona, despite habitat reductions from historic levels. The yellow-billed cuckoo has high potential to occur within the gallery forests within Segments 3B and 3C, and occurrences have been documented adjacent to the Project Area within both Segments 3B and 3C.

Sonoran pronghorn (*Antilocapra americana sonoriensis*). Federal Endangered. High potential to occur.

The Sonoran pronghorn is a long-legged, small-bodied hoofed mammal with an even number of toes on each foot. Its upper part is tan, while its underpart, rump, and two bands across the neck are white. The male has two black cheek patches. Both sexes have horns, although they are larger in males (USFWS 2020). The pronghorn is a federally endangered species found in alluvial valleys with desert scrub and mixed cacti associations. This species is known to occur within Segment 1A, 2, and 1B within the Project Area and has high potential to occur.

Ocelot (*Leopardus pardalis*). Federal Endangered. Moderate potential to occur.

The ocelot is a medium-sized, spotted, nocturnal cat whose back is grayish to cinnamon and paler on the sides; underparts and inside limbs are whitish; and dark markings form streaks that run obliquely down the sides, with two black stripes on each cheek. Its tail is about half the length of its head and body (USFWS 2020). The ocelot is a federally endangered species and can be found in dense thornscrub habitat and the predicted range for this species overlaps the Project Area. There is moderate potential for this species to occur within Segments 3A, 3B, and 3C. In its northern range, the ocelot occurs in subtropical thorn forest, thorn scrub, and dense brushy thickets, often in riparian bottomland where it prefers areas of dense ground cover. The ocelot is more adaptable than the jaguar and could persist in partly cleared forests, dense cover near large towns, second growth woodland, and abandoned cultivation, which have gone back to bush. Vegetation densities in the survey area are sparse to moderate compared to other areas within the ocelot's range; however, the ocelot could potentially migrate through the area or use the terrain itself as cover.

Jaguar (*Panthera onca*). Federal Endangered. Moderate potential to occur.

The jaguar is the largest species of cat native to the Western Hemisphere, weighing from 90-300 pounds. It is muscular, with relatively short, massive limbs, a deep-chested body, and is cinnamon-buff in color with many black spots (USFWS 2020). The jaguar is a federally endangered species and can be found in arid montane and scrub habitats at the northern extent of their range in Arizona. There is moderate potential for this species to occur within Segments 3A, 3B, and 3C.

### **8.1.3.3 Critical Habitat**

Critical habitat has been identified for nine species within or adjacent to the Project Area: San Bernardino springsnail, desert pupfish [Quitobaquito pupfish (*Cyprinodon eremus*)], beautiful shiner, Yaqui catfish, Yaqui chub, Northern Mexican gartersnake, yellow-billed cuckoo, Mexican spotted owl, and jaguar. Quitobaquito Spring is designated as critical habitat by USFWS for desert

pupfish (*Cyprinodon macularius*) and is found within OPCNM. Although this species of desert pupfish (*C. macularius*) is considered to be extirpated from Arizona, the designated critical habitat was put into place before the species split between desert pupfish (*C. macularius*) and Quitobaquito pupfish (*C. eremus*). Quitobaquito Spring is approximately 165 feet north of the Project Area in the middle portion of Segment 1A; designated critical habitat does not occur within the Project Area in this location.

Designated critical habitat has been identified for two special-status species within or immediately adjacent the Segment 3A Project Area within the Coronado National Monument: jaguar and Mexican spotted owl (*Strix occidentalis lucida*). Proposed critical habitat has been identified for two special-status species within Segment 3B within the San Pedro River NCA: Northern Mexican gartersnake and yellow-billed cuckoo.

Within or adjacent to the Segment 3C Project Area, USFWS-designated critical habitat for the following special-status species exists within SBNWR: San Bernardino springsnail, Yaqui chub, Yaqui catfish, and beautiful shiner. Proposed critical habitat for the Northern Mexican gartersnake and yellow-billed cuckoo is also found within SBNWR (see **Appendix A**).

## 8.2 ENVIRONMENTAL CONSEQUENCES

### 8.2.1 Plants and Vegetation Communities

The Project has the potential to have minimal impacts on native vegetation communities. The majority of permanent and temporary impacts have the potential to take place on previously disturbed or developed areas, primarily existing dirt or all-weather access roads. Construction of the fence has the potential to cause temporary impacts on approximately 764 acres, and approximately 458 acres of permanent impacts within the Roosevelt Reservation. Permanent impacts have the potential to take place in the 60-foot-wide area that will be occupied by the replacement bollard-style fencing and the adjacent all-weather road; in some areas of difficult terrain, this corridor could potentially be 150 feet wide. Temporary construction impact areas also have the potential to be within the Roosevelt Reservation and be areas used by equipment along the fence, platforms for cranes, staging areas, and other access routes from existing roads to the work areas. The Project has the potential to result in long-term degradation of vegetation communities as a result of soil erosion on the extreme slopes in the Project Area. However, following construction, restoration of disturbed areas will take place using native plants and have the potential to assist in the minimization of erosion. Any topsoil removed from the work areas will be stockpiled and stored on-site for revegetation activities.

To minimize soil disturbance and erosion, general BMPs will be implemented. Additionally, the anticipated reduction in illegal border traffic from the deterrence provided by the bollard-style fence has the potential to result in a beneficial impact on vegetation communities in the region. Fewer border crossings have the potential to result in fewer opportunities for vegetation to be disturbed by foot traffic, litter, and other human activities.

## 8.2.2 Wildlife and Aquatic Resources

The majority of wildlife likely to be found within the Project Area are common and widespread throughout the region. Mobile wildlife such as birds and larger mammals have the potential to move away from the construction area toward nearby areas of similar habitat, while smaller, slow, or sedentary species such as reptiles, amphibians, and smaller mammals have the potential to be lost during construction. Therefore, direct negligible to minor, negative impacts on wildlife within the Project Area have the potential to occur. However, because construction will be temporary and much of the habitat will be restored, the potential for this Project to result in long-term or significant decreases in most wildlife populations in the region is unlikely. Migratory birds have the potential to be impacted through direct loss of habitat, including foraging, roosting, nesting, and escape cover. Adverse impacts on nesting birds within the Project footprint have the potential to be mitigated by avoidance or relocation by a qualified biologist. BMPs will be implemented to minimize potential impacts on migratory birds. Mammals whose migratory patterns have the potential to be disrupted by the inability to traverse through the bollard-style fencing could also experience the loss of genetic diversity when populations across the border are no longer able to mate.

Construction-related noise has the potential to have short-term impacts on wildlife species within the Project Area. Anthropogenic noise has been found to increase physiological stress, compromise predator/prey detection, affect mating signals and territorial defense, decrease foraging efficiency, and alter temporal or movement patterns in wildlife, although the intensity of behavioral responses due to noise varies among species as well as individuals within a species (Francis and Barber 2013). Because construction activities could take place 24 hours a day and the most active periods for most wildlife are between dusk and dawn, the Project noise-related impacts during construction have the potential to be moderate.

The use of portable construction lighting has the potential to affect wildlife. Light pollution can cause disorientation to wildlife by extending diurnal and crepuscular behaviors into the night. Some species have the potential to benefit from this, as it increases foraging potential for predators but decreases benefits for prey (Longcore and Rich 2004). Conversely, animals that forage at night have the potential to be negatively influenced due to the shortened nighttime hours or could move away from the area altogether.

Reproduction in certain species also has the potential to be affected; frogs, for example, have been documented to stop mating activity in the presence of nighttime light. The Project Area will be illuminated at night by permanent lighting for border enforcement activities, which has the potential to have a moderate impact on wildlife activities. However, all lighting will be shielded and directed down to minimize impacts on wildlife.

Impacts on species occurring nearby or within San Pedro River and Black Draw have the potential to be limited to approximately 0.11 acres of temporary impacts. Impacts have the potential to result from installation of drainage structures to channel storm flows and runoff within the Project Area, as well as areas used during construction of the fence and all-weather road, such as access routes and staging areas. This has the potential to adversely impact wildlife species by altering flow regimes and causing sedimentation. A SWPPP will be developed for each portion of the Project and general BMPs will be employed to prevent construction-related runoff from entering

wetlands and waters. There is also the risk of water reduction in Quitobaquito Springs stemming from construction water usage which has the potential to adversely impact aquatic species and other wildlife that use the Springs for drinking water. BMPs to reduce this risk include requiring contractors to only draw water from designated wells outside a 5-mile buffer zone. Should mitigation be necessary, mitigation for impacts on wetlands and waters will follow regional mitigation standards according to guidance provided by the water agencies. As noted in previous sections, the scope and extent of any mitigation will be based on a final assessment of impacts and available funding.

### 8.2.3 Protected Species and Critical Habitat

Three federally-listed species are known to occur or are present within the Project Area: Yaqui chub, Yaqui topminnow, and Southwestern willow flycatcher.

Both the Yaqui chub and Yaqui topminnow are present in Black Draw. The Yaqui chub is also found in various pools within SBNWR, while the Yaqui topminnow is currently found in both natural and introduced populations in shallow, warm, slow-moving waters in SBNWR. USFWS designated critical habitat for the Yaqui chub within or adjacent to the Segment 3C Survey Area (see **Appendix A**). Approximately .05 acres of habitat used by the two species have the potential to be temporarily impacted by the Project through the dewatering occurring during gate construction and the placement of low water crossings. A portion of the habitat has the potential to be permanently impacted through the addition of gates. However, these impacts have the potential to be minimized through implementation of appropriate BMPs for the protection of these species as well as for general plants, wildlife, and habitats. The scope and extent of any mitigation required will be based on a final assessment of impacts and available funding.

The southwestern willow flycatcher is migratory, with a breeding range in extreme Northern Mexico and the southwestern U.S., including Arizona. Breeding habitat consists of dense riparian forests and thickets along rivers, swamps, lakes, or reservoirs. Limited habitat for the southwestern willow flycatcher is present in riparian areas at Black Draw, Segment 3C, and the San Pedro River, Segment 3B. These areas have the potential to be used for nesting or as a movement corridor to more suitable nesting habitat during migration (CBP 2020a). There is a medium potential for Southwestern willow flycatchers to be present in the Project Area, and one record of this species was documented within Segment 3C (this area is part of their migration corridor). Approximately 3.6 acres of habitat that might be used by the flycatcher have the potential to be temporarily impacted by the Project, either as access roads or staging areas, and 2.2 acres have the potential to be permanently impacted as part of the fence infrastructure or the adjacent patrol road. However, these impacts have the potential to be minimized through implementation of appropriate BMPs for the protection of this species as well as for general plants, wildlife, and habitats. Temporarily impacted areas will be revegetated with native plants or seeds and are expected to function again as suitable gnatcatcher habitat after restoration is complete. As noted above, the scope and extent of any mitigation will be based on a final assessment of impacts and available funding.

## 9. CULTURAL RESOURCES

### 9.1 AFFECTED ENVIRONMENT

“Cultural resources” is an umbrella term for many heritage-related resources defined in several federal laws and executive orders, including the National Historic Preservation Act (NHPA), the Archeological and Historic Preservation Act, the American Indian Religious Freedom Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act (NAGPRA). NHPA focuses on cultural resources such as prehistoric and historic sites, buildings and structures, districts, and other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Such resources might provide insight into the cultural practices of previous civilizations or retain cultural and religious significance to modern groups. Resources judged important under criteria established in NHPA are considered eligible for listing in NRHP. These resources are termed “historic properties” and protected under NHPA.

#### 9.1.1 Project Location and Setting

A full-coverage cultural resources survey was conducted within the Project Area in Pima and Cochise counties. The Area of Potential Effect (APE) was defined as 15 feet on either side of the roads. In addition, the entire footprint of the proposed staging areas was surveyed via multiple pedestrian transects parallel to the road, spaced approximately 50 feet apart. Effectively, an approximately 100-foot-wide area on each side of the access roads was surveyed. Based on recent cultural resources studies conducted within the proposed Project Area, four border road segments (Segments 1A, 1B, 2, and 3B) were not re-surveyed. However, these areas were spot checked at locations where previously recorded cultural resources were documented within the APE. All border road/fence replacement segments are within the Roosevelt Reservation and on lands administered by the CBP, BLM, and NPS in Pima and Cochise counties.

Survey of the 60-ft wide Roosevelt Reservation itself was deemed unnecessary because it has recently been improved, including fence and road upgrades. Prior to those improvements taking place in the late 2000s, the Roosevelt Reservation was surveyed multiple times. Previously recorded sites along the portion of the Roosevelt Reservation included in the scope of work were revisited.

The Project Area is within the Basin and Range Physiographic Province, which covers all of southern Arizona (Hendricks 1985). This province is characterized by northwest to southeast trending fault block mountain ranges punctuated by broad flat alluvial valleys. Specific topographic information is provided individually in the narrative for each road segment.

#### 9.1.2 Cultural History

Human populations have lived in southern Arizona since at least the end of the last ice age, roughly 12,000 years ago. The earliest securely dated sites in the region are mammoth kill sites that have been radiocarbon dated to between 11,500 and 11,000 years ago (Huckell 1995). Cochise and

Pima counties' prehistory include the Archaic (8000 B.C.E. to A.D. 150) and Early Agricultural (2100 B.C.E. to A.D. 150) periods.

The widespread appearance of pottery in southern Arizona is associated with the emergence of the Hohokam, Mogollon, and Patayan cultural traditions. Most of the current study area falls within the Hohokam culture area, including portions that extend through Pima and Santa Cruz counties. Parts of Cochise County are believed to have been settled by both Hohokam immigrants and Mogollon groups. Evidence of Patayan influence is present in western Pima County.

Although Fray Marcos de Niza and Francisco Vásquez de Coronado likely passed through the region between 1539 and 1540 on their way to find the “lost cities of gold,” Spanish knowledge of southern Arizona was minimal until the arrival of Father Eusebio Kino and Captain Juan Manje in 1694. Kino and Manje found Piman-speaking Sobaipuri people living in farming villages along the Santa Cruz River. Subsequent visits by Spanish missionaries encountered O’odham groups in the deserts west of Tucson. Father Bernard Middendorf arrived in the Tucson area in 1757, thus establishing the first Spanish presence in the area. Within 15 years, the San Agustin Mission was initiated at the base of Sentinel Peak (also known as “A” Mountain) (Dobyns 1976).

Not long after the Spanish entrada, the Sobaipuri and O’odham were subjected to repeated attacks by Apache groups encroaching from the east. Many parts of the San Pedro and Santa Cruz valleys were abandoned in favor of the deserts to the west of Tucson in response to Apache raiding. O’odham groups from northern Mexico also immigrated to the western deserts as a result of conflicts with Spanish and Mexican settlers in Sonora. Missionaries and Spanish settlers introduced new crops, fruit trees, horses, and livestock to native populations in the region, as well as metal tools and weapons. Despite this, deteriorating relations between the two groups culminated in 1751 in an uprising known as the Pima Revolt. In response, the Spanish established military garrisons (presidios) along the Santa Cruz River. The area remained under Mexican control until 1848, when the settlement of the Mexican-American War (and later the Gadsden Purchase) ceded much of the Greater Southwest to the United States.

Southern Arizona became part of Mexico after it won independence from Spain in 1821. The U.S. eventually became interested in the region after the war with Mexico ended in 1848, but only the portion of the “New Mexico Territory” north of the Gila River was included in the Treaty of Guadalupe-Hidalgo that brought an end to the conflict. The remaining land south of the Gila River was included as part of the Gadsden Purchase in 1854.

In the 1870s, mining and ranching flourished throughout southern Arizona. Bisbee was established in the late 1870s when Colonel William Herring of New York developed the Neptune Mine. In 1877, silver was discovered at Tombstone, setting off a boom that drew throngs of prospectors to Arizona, but lasted less than 10 years. Tombstone also became famous for its lawlessness; Wyatt Earp and his brothers gained their reputations during the famous gunfight at the O.K. Corral in 1881. By 1880, the Santa Fe and Southern Pacific railroads both extended into Arizona. Ranching began to thrive and both cattle and sheep ranching grew into a major enterprise, often leading to environmental degradation. After 1897, the U.S. Forestry Bureau issued grazing permits to protect public land from further degradation.



When President William H. Taft signed legislation making Arizona a state on February 14, 1912, the economy of southern Arizona was dominated by agriculture, ranching, and mining. Pima County was the largest county, with a total of about 23,000 citizens, mostly in the Tucson area. The main Tohono O’odham Reservation in central Pima, southwestern Pinal, and southern Maricopa counties was created by an executive order on January 14, 1916. It encompasses more than 2.7 million acres, making it the second largest Indian reservation in the United States.

### 9.1.3 Records Check and Results

For this report, cultural resource experts conducted a records search and literature review in a one-mile radius for each of the road locations. Electronic records on file in the AZSITE database at the Arizona State Museum (ASM) were checked, as well as records on file at the AZSHPO. In cases where recent projects had been completed but not yet curated, individual consulting firms were also contacted, and a good faith effort was made to collect all available records. In addition, all previous projects on file, including those in NRHP. Additionally, historical General Land Office plat maps on file with the BLM were also checked for information about historic resources that could have been in the APE for this Project. As a result of the records search, 15 projects were identified near the current APE. Projects are listed in **Table 9-1** and **Appendix E**. Previous investigations include surveying, testing, monitoring, and data recovery efforts. All of the Roosevelt Reservation within the current area of investigation has been previously surveyed.

**Table 9-1. List of Previous Projects**

Segment	Project Type	Project Reference	Date
1A, 1B, and 2	Linear Survey	Bradford et al. 2015	2015
2	Linear Survey	Breen 2004	2004
1A, 1B, and 2	Linear Survey	Corey 2002	2002
3C	Linear Survey	Cox et al. 2014	2014
3C	Linear Survey	Cox and Gage 2015	2015
1A, 1B, and 2	Linear Survey	Dosh 2004	2004
3A	Block Survey	Dosh 2008	2008
3C	Linear Survey	Grant et al. 2008	2008
2	Linear Survey	Harris 2008	2008
1A, 1B, and 2	Linear Survey	Hart and Lindemuth 2007	2007
3C	Linear Survey	Heuett and Maldonado 1990	1990
3B	Survey and Data Recovery	Hopkins et al. 2008	2008
3C	Linear Survey	Martynech et al. 1994	1994
1A, 1B, and 2	Survey	Veech 2019	2019
3C	Linear Survey	Yost et al. 2001	2001

This records search identified 46 previously recorded sites in proximity to the current APE. These sites ranged from prehistoric artifact scatters composed of sherd and lithic scatters and habitation areas to historic artifact scatters comprised of historic refuge dumps and ranching sites. Of the 46 previously recorded sites identified in the records review, 22 site boundaries were determined to intersect within the current Project Area. These 22 site locations were revisited during the current survey.

Cultural resource experts then conducted fieldwork for the Tucson Sector Fence Replacement project in August 2019. The survey was conducted in advance of proposed road repair and maintenance. The survey recorded 28 archaeological sites, which are listed in **Table 9-2**; this total includes six newly recorded sites and the 22 previously recorded sites (see **Appendix E**). Ten of the previously recorded sites could not be relocated or no evidence of the sites was identified within the APE. A variety of site types were identified, ranging from low-density prehistoric artifact scatters with no surface features to large archaic artifact scatters to historic ranch sites. Twenty-two of the sites are prehistoric and three of the sites are historical, while one site is a multi-component site containing both prehistoric and historic artifacts and features. Twenty-three of the

**Table 9-2. Sites Recorded or Revisited During Current Survey**

Site Number/Name	Site Type	Segment	NRHP Eligibility
ORPI 193	Prehistoric and Historic artifact scatter	1A	Eligible
ORPI 218	Prehistoric artifact scatter	1A	Eligible
ORPI 298	Prehistoric artifact scatter and Historic trail	1A	Eligible
ORPI 100	Prehistoric artifact scatter	1B	Eligible
ORPI 299	Prehistoric and Historic trail	1B	Eligible
ORPI 425	Prehistoric artifact scatter	1B	Eligible
19-39-01(NRI)	Historic trash dump	2 (Lukeville APE)	Not Eligible
AZ FF:11:23(ASM)	Prehistoric artifact scatter	3C	Not Eligible
San Bernardino Ranch	NRHP 66000170	3C	Listed
AZ FF:10:67(ASM)	International Border Monument	3C	Eligible
AZ FF:10:66(ASM)	International Border Monument	3C	Eligible
AZ FF:10:65(ASM)	International Border Monument	3C	Eligible
AZ FF:10:63(ASM)	International Border Monument	3C	Eligible
AZ FF:10:62(ASM)	International Border Monument	3C	Eligible
AZ FF:10:61(ASM)	International Border Monument	3C	Eligible
AZ FF:11:85(ASM)	Prehistoric artifact scatter	3C	Eligible
AZ FF:11:48(ASM)	Prehistoric artifact scatter	3C	Eligible
AZ FF:10:68(ASM)	Historic house foundation and artifact scatter	3C	Eligible
AZ FF:10:69(ASM)	Historic house foundation and artifact scatter	3C	Eligible
AZ FF:10:70(ASM)	Historic trash dump	3C	Not Eligible
AZ FF:11:81(ASM)	Prehistoric artifact scatter	3C	Eligible
AZ FF:10:73(ASM)	Prehistoric artifact scatter	3C	Not Eligible
19-39-02(NRI)	Historic ranch property/trash dump	3C	Not Eligible
19-39-03(NRI)	Prehistoric lithic scatter	3C	Not Eligible
19-39-04(NRI)	International Border Monument	3C	Eligible
19-39-05(NRI)	International Border Monument	3C	Eligible
19-39-06(NRI)	International Border Monument	3C	Eligible
AZ FF:10:10(ASM) Douglas Municipal Airport	NRHP 75000336	3C	Listed

Key: ORPI = Organ Pipe; ASM = Arizona State Museum; NRI = Northland Research Inc.; AZ FF = Quad Map Site.

sites are recommended as eligible for listing on the Arizona Register of Historic Places (ARHP) and NRHP. Two of the revisited sites are currently listed in ARHP and NRHP. Six are recommended ineligible. The survey also recorded one isolated occurrence.

#### 9.1.4 Visual APE

Federal regulations stipulate that disturbances to the viewshed of historic properties should be considered when assessing potential adverse effects prior to an undertaking. Under the proposed Project, the height of the existing primary border fence will be more than doubled and could be tripled in some areas. Due to the increased height and in an effort to consider all potential impacts, a viewshed analysis was conducted for all NRHP-listed historical structures within one half mile north of the primary border fence. Only one site (San Bernardino Ranch: NRHP-listed 66000170) is considered to have potential adverse effects to the property setting due to the construction of the proposed border fence replacement.

The San Bernardino Ranch is the site of two historic cattle ranches in southern Arizona's San Bernardino Valley, a region that did not see permanent European settlement until the late 19th century. Apache raids throughout the region prevented the Spanish from building a garrison there in the 1770s and forced a Mexican rancher to abandon his land in the 1830s, but in the 1880s American rancher and "wild west" sheriff John H. Slaughter settled San Bernardino with his family and founded a successful cattle ranch.

## 9.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP does not have any specific obligations under NHPA, DHS and CBP recognize the importance of responsible environmental stewardship. CBP has therefore applied the general standards and guidelines associated with NHPA as the basis for evaluating potential environmental impacts and appropriate BMPs.

On August 19, 2019, archaeologists revisited six archaeological sites within OPCNM near the Project Area. These sites included ORPI 100, 193, 218, 298, 299, and 425. Two of the six sites (ORPI 298 and 299) consisted of historic trails. The remaining sites consist of previously recorded historic and prehistoric artifact scatters. The archaeologists completed surveys of these site locations and were able to relocate three of the six sites (ORPI 193, 298, and 299). ORPI 298 and ORPI 299 are historic trails that were relocated; however, the trails are not well defined and do not intersect with the proposed APE. ORPI 193 is a multi-component, 47,000 m<sup>2</sup> (505,904 ft<sup>2</sup>) artifact scatter situated 185 m (606 ft) southeast of the Quitobaquito pond oasis; the site contains ceramic sherds, flaked and ground stone artifacts, and fire-cracked rock clusters.

ORPI 193 was the only site determined to intersect with the current Project Area. Based on the current survey and previous recordings, ORPI 193 is recommended eligible for inclusion in the NRHP under Criterion D (information potential). Avoidance of ORPI 193 is recommended. The remaining five sites are north of the current APE and do not have the potential to be impacted by the Project. No further work is recommended at the sites.

Avoidance is recommended for all cultural resource sites eligible for inclusion in NRHP. Because the survey APE is larger than the actual road maintenance and repair footprint, avoidance will be

accomplished by restricting the maintenance activities to the current road footprint. Additionally, potential adverse effects from indirect impacts—visual APE—to historic properties (NRHP-listed San Bernardino Ranch) should be avoided. Lastly, should significant cultural resources be discovered during any possible future ground-disturbing activities, the contractor should stop all ground-disturbing activities in the vicinity of the discovery until officials from CBP are notified and the nature and significance of the find can be evaluated.

If human remains are encountered during construction activity, construction should stop, and the proper authorities from CBP must also be notified per NAGPRA. With the implementation of these recommendations, in conjunction with the BMPs listed in **Chapter 1.5.7**, the Project will not have the potential to directly or indirectly, adversely impact known cultural resources.

### 9.2.1 Visual APE

While there is no potential for direct impact to the archaeological APE of the San Bernardino Ranch, an assessment of the visual APE indicates potential adverse effects to the setting of the historic property. It is recommended that further assessment of the potential indirect impact to the San Bernardino Ranch be conducted prior to the proposed construction.

## 10. SOCIOECONOMICS

### 10.1 AFFECTED ENVIRONMENT

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. While population and demographic data are relatively straightforward and maintained by the Census Bureau, there are many factors that can be used as indicators of economic conditions for a geographic area, such as employment and unemployment rates, employment by business sector, and median household income.

The region of influence for the Project includes Yuma, Pima, Santa Cruz, and Cochise counties—four of the 15 counties in Arizona—which account for 20.3% of the state’s total population. The demographics of the counties are listed in **Table 10-1**. Of these, Pima has the largest population (1 million in 2017), while Santa Cruz has the smallest (46,358). The racial mix of all four counties is mainly composed of Caucasians (ranging from 73–86%). For three of the counties, this is followed by people claiming to be some race other than Caucasian, African American, Native American, Asian, Native Hawaiian, or other Pacific Islander (for Cochise County, the next largest population is people of two or more races). All four counties have larger populations of Hispanic origin than the state average; Santa Cruz’s Hispanic population is the largest at 83% (U.S. Census Bureau 2019a).

**Table 10-1. Demographics by County**

County	Total Population, 2017	Caucasian (%)	Some Other Race	Black/ African American	American Indian/ Native Alaskan	Asian	Native Hawaiian/ Pacific Island	2+ Races	Hispanic/ Latino*
Yuma	204,281	73.1%	19.6%	2.1%	1.3%	1.3%	0.1%	2.5%	62.9%
Pima	1,007,257	76.9%	8.8%	3.5%	3.5%	2.8%	0.2%	4.5%	36.6%
Santa Cruz	46,358	86.2%	10.9%	.5%	.5%	0.9%	0	1.1%	83.4%
Cochise County	126,516	84.4%	3.8%	3.8%	1.2%	1.8%	0.4%	4.5%	35%
Arizona	6,809,946	77.5%	7%	4.3%	4.4%	3.1%	0.2%	3.5%	30.9%

\*Percentage not included as part of demographic total.

Source: U.S. Census Bureau 2019a.

The estimated number of citizens employed in the four counties in 2017 was 433,478 for Pima; 74,891 for Yuma; 43,404 for Cochise; and 17,421 for Santa Cruz. Educational service, health care, and social assistance was the top industry for all four counties, as well as for the state as a whole. This was followed by retail trade for Yuma and Santa Cruz; professional, scientific, and management, and administrative and waste management services for Pima; and public administration for Cochise. In 2017, the unemployment rate for all four counties was higher than Arizona’s (7.1%) and ranged from 7.6% for Cochise to 10.9% for Yuma (U.S. Census Bureau 2019b). The employment data for the four counties is listed in **Table 10-2**.

**Table 10-2. Employment Data**

County	Civilians Employed in County	Top Industries	Unemployment Rate
Yuma	74,891	Educational services, and health care and social assistance (19.8%) Retail trade (12.7%) Agriculture, forestry, fishing and hunting, and mining (11.3%)	10.9%
Santa Cruz	17,421	Educational services, and health care and social assistance (19.7%) Retail trade (15%) Arts, entertainment, and recreation, and accommodation and food services (10.1%)	8.7%
Pima	433,478	Educational services, and health care and social assistance (25.1%) Professional, scientific, and management, and administrative and waste management services (12.6%) Retail trade (11.8%)	8.4%
Cochise	43,404	Educational services, and health care and social assistance (21.5%) Public administration (16.6%) Professional, scientific, and management, and administrative and waste management services (12.8%)	7.6%
Arizona	2,953,891	Educational services, and health care and social assistance (22%) Retail trade (12.3%) Professional, scientific, and management, and administrative and waste management services (12.1%)	7.1%

Source: U.S. Census Bureau 2019b.

In 2018, all four counties had a per capita personal income (PCPI) lower than the state average of \$44,329 and ranged from \$35,682 for Yuma County (9th in the state), to \$44,028 for Pima County (3rd in the state). These are all significantly lower than the national PCPI of \$54,446 (BEA 2019). Total personal income (TPI) of an area is the income that is received by, or on behalf of, all the individuals who live in that area. In 2018, the TPI for these four counties ranged from \$1.8 billion for Santa Cruz County to \$45.7 billion for Pima County. The income for each of the four counties is listed in **Table 10-3**.

**Table 10-3. County Income Comparison**

Location	PCPI <sup>1</sup>	TPI <sup>1</sup>	Median Household Income <sup>2</sup>
Yuma County	\$35,682	\$7.6 billion	\$43,253
Pima County	\$44,028	\$45.7 billion	\$48,676
Santa Cruz County	\$39,057	\$1.8 billion	\$39,630

Cochise County	\$40,308	\$5.1 billion	\$47,847
Arizona	\$44,329	\$317.9 billion	\$53,510
United States	\$54,446		\$57,652

<sup>1</sup>Source: BEA 2019.

<sup>2</sup>Source: U.S. Census Bureau 2019b.

## 10.2 ENVIRONMENTAL CONSEQUENCES

The Project is not anticipated to have impacts, direct or indirect, on long-term population or employment. There is the potential for temporary beneficial effects on the local economy due to the additional employment for Project construction and additional income and sales tax from the purchase of goods and materials. No potential long-term, beneficial effects on socioeconomic factors are anticipated.

Yuma, Pima, Santa Cruz, and Cochise counties have the potential to benefit from the Project in the long term, since the replacement of the primary fence and installation of complimentary security facilities will provide additional protection from illegal traffic across the border.

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## 11. HAZARDOUS MATERIALS AND WASTE

### 11.1 AFFECTED ENVIRONMENT

Hazardous materials or wastes have a chemical composition or other properties that make them toxic or otherwise capable of causing illness, death, or some other harmful effect on humans or the environment when mismanaged or released.

USEPA maintains a list of hazardous waste sites, particularly waste storage/treatment facilities or former industrial manufacturing sites in the U.S. The chemical contaminants released into the environment (e.g., air, soil, groundwater) from hazardous waste sites could include heavy materials, organic compounds, solvents, and other chemicals. The potential adverse impact of hazardous waste sites on human health is a considerable source of concern to the general public, as well as government agencies and health professionals.

Solid and hazardous wastes are regulated in Arizona by a combination of mandated laws promulgated by the federal, state, and regional Councils of Government. A search of USEPA's Envirofacts Data Warehouse showed no superfund sites near the Project Area (USEPA 2019b).

In addition to the laws and regulations mentioned earlier, EO 12088, Federal Compliance with Pollution Control Standards, as amended, directs federal agencies to (1) comply with "applicable pollution control standards," in the prevention, control, and abatement of environmental pollution; and (2) consult with USEPA, state, and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution.

### 11.2 ENVIRONMENTAL CONSEQUENCES

Soils in the Project Area have the potential to be impacted by hazardous or toxic materials in the event of an accidental spill, which could lead to groundwater contamination. To minimize the potential for release of hazardous materials into the environment, BMPs will be implemented during construction activities to avoid a release to the environment and to anticipate capture requirements in advance of any potential release. To prevent contamination of the Project Area, care will be taken to avoid impacting the Project Area with hazardous substances (e.g., anti-freeze, fuels, oils, lubricants) used during construction. POLs will be stored at designated temporary staging areas to maintain and refuel construction equipment. These activities include primary and secondary containment measures; a SPCCP will be in place prior to the start of construction, and all personnel will be briefed on the implementation and responsibilities of this plan.

Cleanup materials (e.g., oil mops), in accordance with the Project's SPCCP, will also be maintained at the site to allow immediate action in case an accidental spill occurs. Drip pans will be provided for the power generators and other stationary equipment to capture any POLs accidentally spilled during maintenance activities or leaks from the equipment. A concrete washout containment system will be established to ensure concrete washout is safely managed and disposed of properly.

Sanitation facilities will be provided during construction activities, and waste products will be collected and disposed of by licensed contractors. No gray water will be discharged to the ground.

Disposal contractors will use only established roads to transport equipment and supplies; all waste will be disposed of in strict compliance with federal, state, and local regulations, in accordance with the contractor's permits. All construction waste will be disposed in compliance with federal, state, and local regulations. Due to the proper permits being obtained by the licensed contractor tasked to handle any unregulated solid waste, and because all of the unregulated solid waste will be handled in the proper manner, no hazards to the public have the potential to occur through the transport, use, or disposal of unregulated solid waste.

## 12. RELATED PROJECTS AND POTENTIAL EFFECTS

### 12.1 CUMULATIVE AFFECTED ENVIRONMENT

This chapter of the ESP addresses the potential combined impacts associated with the implementation of the Project and other projects/programs that are planned for the region. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time by various agencies (federal, state, and local) or individuals. Informed decision making is served by consideration of cumulative impacts resulting from projects that are planned, 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 projects. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on resources such as soils and vegetation is very narrow and focused on the location of the resource. The scope of air quality, wildlife and sensitive species, visual resources, and socioeconomics is much broader and considers more county or region-wide activities. Projects that were considered for this analysis were identified by reviewing USBP documents, news releases, and published media reports, as well as through coordination with planning and engineering departments of local governments and state and federal agencies, although only projects on the U.S. side of the border were possible to evaluate. Projects that do not occur in close proximity (i.e., within several miles) to the Project will not contribute to a cumulative impact (or are not possible to evaluate if they are south of the border) and are generally not evaluated further.

USBP has been conducting law enforcement actions along the border since its inception in 1924 and has continually transformed its methods as new missions, CBV modes of operation, agent needs, and National enforcement strategies have evolved. Development and maintenance of training ranges, station and sector facilities, detention facilities, and roads and fences have affected thousands of acres, with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects have resulted from the construction and use of these roads and fences as well, including but not limited to: increased employment and income for border regions and surrounding communities, protection and enhancement of sensitive resources north of the border, reduction in crime within urban areas near the border, increased land value in areas where border security has increased, and increased knowledge of the biological communities and pre-history of the region through numerous biological and cultural resource surveys and studies.

With continued funding and implementation of CBP's environmental conservation measures, including environmental education and training of its agents, use of biological and archaeological monitors, and restoration of wildlife water systems and other habitats, adverse impacts from ongoing and future projects will be prevented or minimized. However, recent, ongoing, and reasonably foreseeable proposed projects will result in cumulative impacts. General descriptions of these types of activities are discussed in the following paragraphs.

## 12.2 CUMULATIVE FENCING ALONG THE SOUTHWESTERN BORDER

As of April 24, 2020, CBP has constructed approximately 731 total miles of border barrier wall, including approximately 649 miles of primary barriers and approximately 109 miles of secondary barriers on the southwestern border (CBP 2020b). A summary of past, present, and reasonably foreseeable future actions near the Project Area are presented below.

### 12.3 PAST ACTIONS

Past actions are those in the relatively recent past that are within the cumulative effects analysis areas of this ESP. The effects of these past actions are generally described throughout the previous sections. For example, the existing vehicle and pedestrian fence, the Lukeville, Naco, and Douglas POEs, the existing access roads, and the previously developed border infrastructure system (BIS) have all contributed to the existing environmental conditions of the area.

### 12.4 PRESENT ACTIONS

Present actions include current or funded construction projects, USBP or other agency actions in close proximity to the fence locations, and current resource management programs and land use activities within the cumulative effects analysis area. Ongoing actions considered in the cumulative effects analysis include the following:

- **Border Wall:** Currently, approximately 74 miles of border barrier projects are being constructed in Cochise, Pima, and Santa Cruz counties. This includes 31 miles of new or replacement primary fencing and 1 mile of secondary fencing in Cochise County; 15 miles of new or replacement primary fencing in Pima County; and 27 miles of new or replacement primary fencing in Santa Cruz County.

A review of the Arizona Department of Transportation website and the Planning and Zoning websites of the four affected counties did not yield any results for additional construction projects to consider.

### 12.5 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects. The following projects are reasonable foreseeable actions that are likely to occur in the Tucson Sector:

- **Border Wall:** As part of this or future administrations, DHS/CBP could construct additional border walls in the USBP Tucson Sector AOR.

USBP might be required to implement other activities and operations that are currently not foreseen or mentioned in this document. These actions could be in response to National emergencies or security events, or to changes in the mode of operations of CBVs.

Plans by other agencies that will also affect the region's natural and human environment include various road improvements by Arizona Department of Transportation and Cochise, Pima, and

Santa Cruz Counties. The majority of these projects will be expected to occur along existing corridors and within previously disturbed areas. The magnitude of the impacts depends upon the length and width of the road right-of-way and the conditions within and adjacent to the right-of-way. However, currently no large state or county projects are ongoing or near completion within the vicinity of the Project Area.

Other organizations, such as the Tohono O’odham Nation, BLM, and Barry M. Goldwater Air Force Range, routinely prepare or update Resource Management Plans for the resources they manage. A summary of the anticipated cumulative impacts relative to the project (i.e., construction of the all-weather road and installation of the secondary fence) is presented below. These discussions are presented for each of the resources previously described.

## **12.6 ENVIRONMENTAL CONSEQUENCES**

### **12.6.1 Air Quality**

The emissions generated during and after the replacement of the legacy pedestrian and vehicle fence have the potential to be short-term and minor. There is the potential for cumulative adverse construction impacts on air quality from the current or foreseeable wall replacement project discussed above. The emissions associated with these actions also have the potential to result in short-term and minor impacts on the airshed, even when combined with the other proposed developments in the border region. CBP will minimize air quality impacts by using standard BMPs, such as dust suppression, during construction. Deterrence of and improved response time to illegal border crossings created by the construction of infrastructure have the potential to lead to improved control of the border. A potential result of this improved control could be a reduction in the number of off-road enforcement actions that are currently necessary by USBP agents, thus potentially reducing dust generation and serving to benefit overall air quality as well.

### **12.6.2 Noise**

Most of the noise generated by the Project has the potential to occur during construction and thus is not likely to contribute to cumulative impacts of ambient noise levels. Routine maintenance of the primary pedestrian fence and roads has the potential to result in slight temporary increases in noise levels that could sporadically occur over the long-term and have the potential to be similar to those of ongoing road maintenance within the Project Area. Potential sources of noise from other projects are not significant enough (temporally or spatially) to increase ambient noise levels above 75 dBA at the Project sites. Thus, the noise generated by the construction and maintenance of Project infrastructure, when considered with the other existing and proposed projects in the region, has the potential to have minor cumulative adverse effects.

### **12.6.3 Land Use, Recreation, and Aesthetics**

The Project has the potential to primarily affect lands in the Roosevelt Reservation, which was set aside specifically for border control actions. This Project is therefore consistent with the authorized land use and, when considered with other potential alterations of land use, does not have the potential to have a major cumulative adverse impact. Similarly, the open space opportunities they provide would not likely be affected by the Project and do not have the potential

to be negatively impacted when considered with other present and foreseeable projects in the region.

There is the potential for visually apparent changes within the viewsheds that currently include the primary fence. However, although the addition of a new, larger fence has the potential to cause an adverse visual effect in some areas, it does not constitute a major impact on visual resources within the Project Area due to the presence of currently existing infrastructure. Still, when considered with other USBP projects, it has the potential to degrade the existing visual character of the region; thus, cumulative impacts have the potential to be considered moderate and CBP will minimize impacts on resources to the maximum extent feasible.

Areas north of the border within the construction corridors have the potential to experience beneficial, indirect cumulative impacts on aesthetics and habitat through the reduction of trash, soil erosion, and creation of trails by illegal pedestrian traffic.

#### **12.6.4 Geological Resources and Soils**

The Project does not have the potential to create any dangerous or unstable conditions within any geologic unit, nor expose people or structures to potential substantial adverse effects. Further, no geologic resource is exclusively within the Project Area. The Project impact on previously disturbed lands, when combined with past and proposed projects in the region, will have the potential to have minor, cumulative adverse impacts on geological resources.

The Project, when combined with other USBP projects, will not have the potential to permanently reduce prime farmland soils or agricultural production. Pre- and post-construction SWPPP measures will be implemented to control soil erosion. The permanent impact of approximately 23 acres for legacy fence replacement combined with the other USBP projects, has the potential to have a moderate cumulative adverse impact.

#### **12.6.5 Hydrology and Water Management**

As a result of the Project, when combined with other USBP projects, increased temporary erosion during construction has the potential to occur; however, due to the presence of a single perennial surface water body in the Study Area, increased sedimentation and turbidity have the potential to have a minor cumulative impact on water quality. Pre- and post-construction SWPPP measures for this and other projects will be implemented to control erosion. Water withdrawal from domestic water supplies or regional groundwater basins for dust suppression and other construction/maintenance activities, for this and other related projects in the region, have the potential to result in cumulatively considerable impacts. Additionally, these short-term activities have the potential to affect long-term water supplies or the quantity of groundwater in the region. Although the volume of water withdrawn will not likely affect the public drinking water supplies, it has the potential to indirectly contribute to aquifer contamination from surface runoff. With the implementation of appropriate BMPs, it is unlikely that the Project will have the potential to substantially affect water quality.

### 12.6.6 Biological Resources (Vegetation, Wildlife, Aquatic Species, Special Status Species)

The Project has the potential to have minimal impacts on native vegetation communities, but as discussed in **Chapter 8**, some direct negative impacts on wildlife within the Project Area have the potential to occur including impacts to migration corridors. Other direct negative impacts have the potential to occur due to erosion, noise, lighting, or conflict with construction equipment. However, because construction has the potential to be temporary and impacts will be minimized through implementing appropriate BMPs for the protection of general plants and wildlife, these combined projects are unlikely to result in any long-term or significant decreases in wildlife populations in the region.

### 12.6.7 Cultural Resources

Construction of the Project has the potential to impact one NRHP-eligible cultural resource site; however, with the implementation of monitoring and other avoidance measures, as described in **Chapter 9**, the Project has the potential to result in minimal, if any, adverse impacts. Therefore, this action, when combined with other existing and proposed projects in the region, has the potential to have negligible cumulative impacts on cultural resources.

### 12.6.8 Socioeconomics

Construction of the Project, when combined with other USBP projects, has the potential to result in temporary, minor, and beneficial impacts on the region's economy. No impacts on populations, minorities, or low-income families have the potential to occur. When practicable, materials and other Project expenditures will predominantly be obtained through merchants in the local community. Local construction crews will also be employed to complete the Project. Safety buffer zones will be designated around all construction sites to ensure public health and safety. Long-term, cumulative effects of the projects on the regional economy have the potential to be beneficial by reducing smuggling and other illegal activity in the area. Legal border crossings and international trade have the potential to continue unaffected by the Project. When combined with other ongoing or currently planned projects within the region, there is the potential for minor cumulative, temporary beneficial impacts on the region's socioeconomics.

### 12.6.9 Hazardous Materials and Waste

The use of hazardous substances will be required in small amounts within the Project Area during the construction phase. With the inclusion of BMPs listed in **Chapter 1.5.8**, impacts resulting from the use of hazardous materials during this phase have the potential to be avoided or minimized. Similarly, only minor temporary increases in the use of hazardous materials would potentially be experienced from construction associated with other projects in the region. Removal of the existing fence could generate waste, but most of the existing steel plate and mesh material is valuable as a recyclable material. Therefore, the Project, when combined with other ongoing and proposed projects in the region, does not have the potential to have a major cumulative impact on the generation of waste nor the potential for release of hazardous materials.

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## 14. ABBREVIATIONS AND ACRONYMS

ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AESFO	Arizona Ecological Services Field Office
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
AMSL	above mean sea level
ANPS	Arizona Native Plant Society
AOR	Area of Responsibility
APE	Area of Potential Effect
ARHP	Arizona Register of Historic Places
ASM	Arizona State Museum
AZGS	Arizona Geological Survey
AZSHPO	Arizona State Historic Preservation Office
BEA	Bureau of Economic Analysis
BIS	Border Infrastructure System
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
BSR	Biological Survey Report
CAA	Clean Air Act
CBP	U.S. Customs and Border Protection
CBV	cross-border violator
CFR	Code of Federal Regulations
CO	Carbon monoxide
CPNWR	Cabeza Prieta National Wildlife Refuge
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted decibel
DHS	Department of Homeland Security
DOI	Department of the Interior

EO	Executive Order
ESP	Environmental Stewardship Plan
ESSR	Environmental Stewardship Summary Report
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
GPD	Gallons per day
GPM	Gallons per minute
IBWC	International Boundary and Water Commission
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act
INA	Irrigation Non-Expansion Area
mg/m <sup>3</sup>	Milligram per cubic meter
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	National Conservation Area
NHPA	National Historic Preservation Act
NO <sub>x</sub>	Total nitrogen oxides
NO <sub>2</sub>	Nitrogen dioxide
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O <sub>3</sub>	Ozone
OHWM	Ordinary High Water Mark
OPCNM	Organ Pipe Cactus National Monument
OSHA	Occupational Safety and Health Administration
PCPI	per capita personal income
PM	Particulate matter
ppb	Parts per billion
ppm	Parts per million
PM <sub>10</sub>	Particulate matter less than or equal to 10 microns in diameter
POE	Port of Entry

POLs	petroleum, oil, and lubricants
SBNWR	San Bernardino National Wildlife Refuge
SGCN	Species of Greatest Conservation Need
SO <sub>2</sub>	Sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan
TPI	Total personal income
tpy	Tons per year
µg/m <sup>3</sup>	micrograms per cubic meter
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WAFWA	Western Association of Fish and Wildlife Agencies
°F	degrees Fahrenheit

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# APPENDIX A

## Biological Survey Report



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## **APPENDIX B**

### Mapbooks



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## **APPENDIX C**

### Air Emissions Calculations



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## **APPENDIX D**

### Waters of the U.S. Delineation Report



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## **APPENDIX E**

### Cultural Resources Survey Report



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