RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Phase 1 Rehabilitation
San Carlos Irrigation Project Facilities

Pinal County, Arizona

U.S. Department of the Interior
Bureau of Reclamation
Phoenix Area Office

June 2010

Draft Environmental Assessment

Phase I Rehabilitation
San Carlos Irrigation Project
Pinal County, Arizona

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DISCLAIMER STATEMENT

EcoPlan Associates, Inc., has been contracted by the Bureau of Reclamation to assist with the preparation of this Environmental Assessment. EcoPlan declares no financial or other interest in the outcome of the proposed project pursuant to the requirements of 40 CFR Section 1506.5.

June16, 2010

F. Bruce Brown, Principal
EcoPlan Associates, Inc.

Date

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game and Fish Department
AGS	Arizona Geological Survey
APE	area of potential effects
ASM	Arizona State Museum
AWSA	Arizona Water Settlements Act
AZPDES	Arizona Pollutant Discharge Elimination System
BG	Block Group
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	carbon dioxide
Corps	U.S. Army Corps of Engineers
CT	Census Tract
CWA	Clean Water Act
DM	Departmental Manual
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
FCG Canal	Florence–Casa Grande Canal
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gas
HAER	Historic American Engineering Record
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PCAQCD	Pinal County Air Quality Control District
PEIS	Programmatic Environmental Impact Statement
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 but more than 2.5 microns in diameter
P-MIP	Pima-Maricopa Irrigation Project
Reclamation	Bureau of Reclamation
SCADA	Supervisory Control and Data Acquisition
SCIDD	San Carlos Irrigation and Drainage District
SCIP	San Carlos Irrigation Project

SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Waters	Waters of the United States
WIFL	Southwestern willow flycatcher

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The San Carlos Irrigation and Drainage District (SCIDD) is proposing Phase 1 rehabilitation of Joint Works facilities on the Bureau of Indian Affairs (BIA) San Carlos Irrigation Project (SCIP), approximately 6.5 miles northeast of the town of Florence in Pinal County, Arizona (Figure 1). Phase 1 involves rehabilitation of the Ashurst-Hayden Diversion Dam and associated headworks on the Florence–Casa Grande Canal (FCG Canal) and construction of a sediment removal and storage facility. Rehabilitation of other off-reservation SCIP facilities will be addressed in a subsequent Environmental Impact Statement.

This Draft Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500–1508), Department of the Interior NEPA regulations (43 CFR 46), and Reclamation NEPA Handbook (2000 draft edition). The Bureau of Reclamation (Reclamation) is the lead Federal agency responsible for the preparation of this Draft EA. The Gila River Indian Community/the Pima-Maricopa Irrigation Project (P-MIP), the BIA/SCIP, and SCIDD are cooperating agencies in the preparation of this document.

This Draft EA tiers from the Programmatic Environmental Impact Statement (PEIS) for the P-MIP completed in 1997. The PEIS addressed Gila River Indian Community plans to construct and operate a common-use irrigation system, place up to 146,330 acres of land into agricultural production, and rehabilitate selected SCIP Joint Works facilities. The PEIS allowed for a programmatic-level evaluation of the P-MIP at full implementation. Because adequate details had not yet been determined when the PEIS was prepared, the PEIS included commitments to prepare subsequent NEPA documentation for project components, including those associated with Phase 1 rehabilitation.

1.2 BACKGROUND

In 1976, the Gila River Indian Community filed claims with the court to have its water rights quantified. These efforts culminated in the promulgation of the Gila River Indian Community Water Rights Settlement Agreement (Amended and Restated, Final Version, October 21, 2005), and Title II of the Arizona Water Settlements Act (AWSA) (Public Law 108-451, December 10, 2004). Section 203 of the AWSA authorizes the execution of the Gila River Indian Community Water Rights Settlement Agreement and directs the Secretary of the Interior to provide for the rehabilitation and replacement of SCIP water diversion and delivery works, known as the Joint Works, with funds provided by Reclamation under Section 403(f)(2) of the Colorado River Basin Project Act (Public Law 90-537, as amended, September 20, 1968). In addition, Section 203 designates Reclamation as the lead agency with respect to environmental compliance and for oversight of construction and rehabilitation of SCIP.

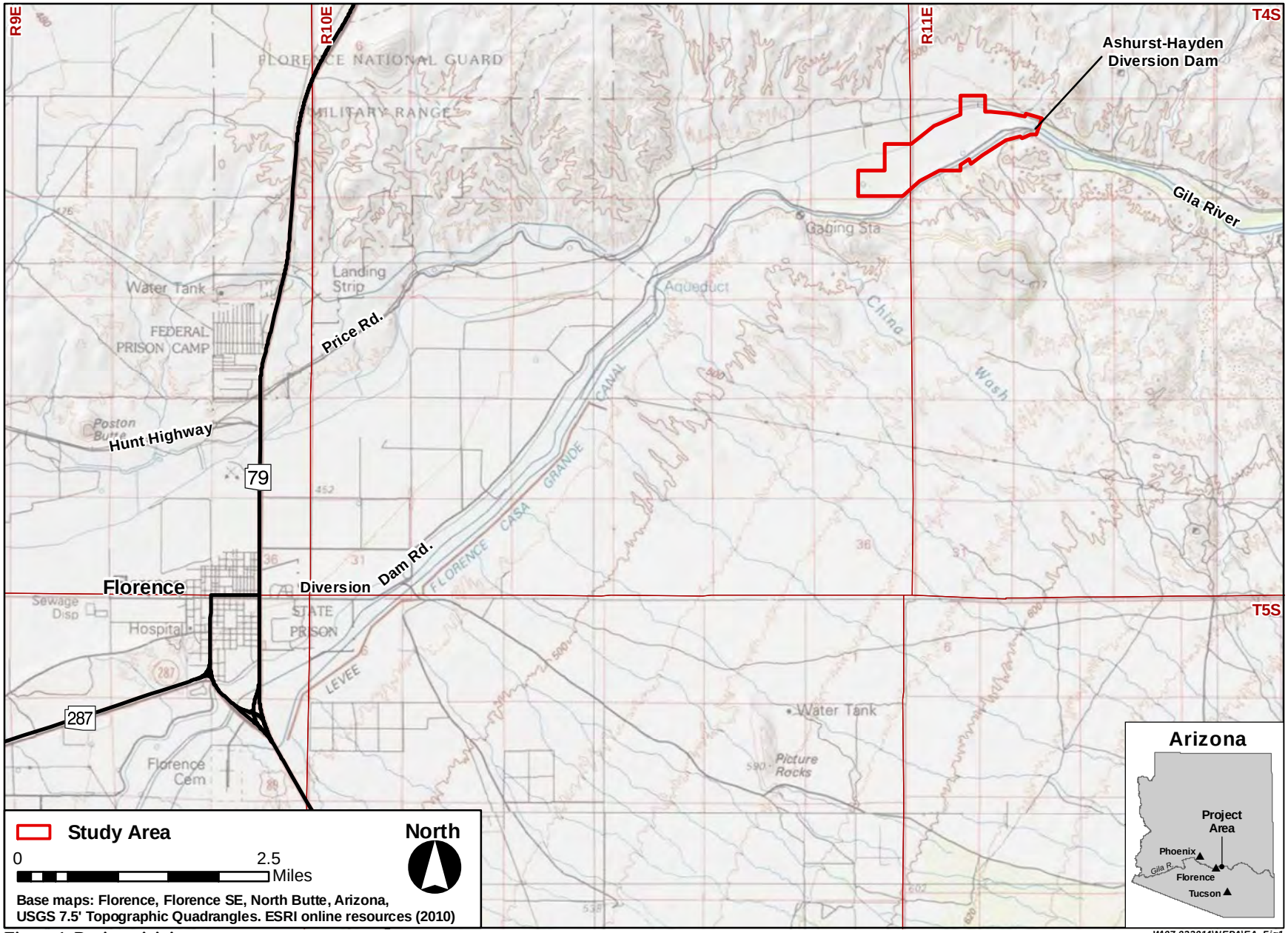

Figure 1. Project vicinity.

The SCIP Joint Works facilities convey water from the Gila River and Central Arizona Project to 50,546 acres of Indian farmland located on the Gila River Indian Community served by P-MIP, and 50,000 acres of non-Indian farmland located outside the Gila River Indian Reservation served by SCIDD. Major components of the SCIP Joint Works include Coolidge Dam and Reservoir, the Ashurst-Hayden Diversion Dam, the FCG Canal, the Pima Lateral Interconnection, the Pima Lateral, and Picacho Reservoir.

1.3 PURPOSE AND NEED FOR ACTION

The purpose of the proposed Phase 1 project is threefold: (1) to improve the operation and increase the useful life of the Ashurst-Hayden Diversion Dam and headworks, (2) to improve water delivery efficiencies and reduce long-term operation and maintenance costs of the irrigation system by removing sediment from the FCG Canal immediately downstream of the headworks, and (3) to protect the FCG Canal and proposed settling basin from potential flood damage by armoring the south bank of the Gila River. Improved operational control and sediment management are important because of ongoing work to install concrete lining on P-MIP distribution canals and future plans to line Joint Works and SCIDD distribution canals. Constructed in 1922, the Ashurst-Hayden Diversion Dam and headworks are in need of repair due to age-related deterioration and operational deficiencies. The concrete in the headworks is spalling (chipping or fragmenting) and, in some places, steel reinforcement is exposed.

1.3.1 Ashurst-Hayden Diversion Dam and Headworks

The diversion dam is an 11.5-foot-high, 400-foot-long concrete overflow weir. A headworks structure, with nine regulation bays, regulates flow into the FCG Canal. In 1930, the weir was raised 1 foot with the addition of a concrete cap. Metal flashboards, 2 feet in height, were subsequently added to the raised crest of the diversion dam. These flashboards were intended to fold down at a particular water level elevation.

From its initial operation, the diversion dam and headworks structure have trapped and diverted a significant amount of sediment. The original works included four low-level sluice gates designed to permit sluicing (flushing) of the accumulated silt from the front side of the headworks structure. With the construction and operation of Coolidge Dam, Gila River flows became regulated to the point that little flow in excess of the FCG Canal capacity was available for sluicing, causing these gates to silt in and become inoperable. In 1955, a 20-foot-wide by 13-foot-high electrically powered radial gate was installed in the location of two of the original sluice gates. The remaining two sluice gates were closed off and abandoned. Currently, water leaks underneath the two previously abandoned sluice gates. The effectiveness of the radial gate, currently used to carry sediment away from the regulation bays when river flows are high, has been reduced because the accumulation of sediment in the river channel downstream of the gate has limited the hydraulic head (depth of water) available for sluicing.

Ashurst-Hayden Diversion Dam was originally built with a fuse plug (an earthen section of dam) on the north end of the diversion dam designed to provide protection for the dam from large floods. The principle behind the fuse plug is that, in flood conditions when the water velocity is so high that the dam itself could be put in danger, the fuse plug simply washes away, and the floodwaters safely spill over the dam. A segment of the fuse plug at the dam has been scoured

down from previous flooding. Ever since, flood flows bypass the dam prematurely, decreasing hydraulic head and sluicing effectiveness.

Proper functioning of the diversion dam and associated headworks is necessary to regulate flows entering the FCG Canal from the Gila River. The regulation bays that constitute the headworks are designed to control water diversions. During normal operations, the radial gate is closed so the only outlet from the area behind the dam is through the regulation bays of the headworks. Sediment has accumulated to the level of the sills of the regulation bays. None of the original flap gates in these regulation bays are operable; water diversions are currently controlled by heavier bulkhead gates. Regulation of flows must now be performed by adjusting gate openings using a mobile crane to raise and lower bulkheads. Three of the regulation bays can no longer be used because the bulkhead gates are stuck in the closed position. Furthermore, flow capacity of the remaining regulation bays is severely restricted when trash and debris become trapped in the regulation bays.

1.3.2 Sediment Management

Gila River water is heavily laden with sediment, which enters the SCIP system in flows diverted at Ashurst-Hayden Diversion Dam. Sediment deposition and accumulation in the system has caused operational inefficiencies and maintenance problems, which ultimately impede water deliveries. Sediment management and storage is needed for effective operation of the water conveyance infrastructure.

1.3.3 Bank Protection

In the vicinity of the Ashurst-Hayden Diversion Dam and headworks, the FCG Canal is in close proximity to the Gila River. Only a narrow embankment separates the Gila River from the canal and entry point to the proposed settling basin, making the embankment and the settling basin vulnerable to erosion or breaching and the canal vulnerable to flood damage. This area has been damaged by flooding in the past. Protection of the river bank at this location is needed to avoid damage to the settling basin and the canal, and interruption of water deliveries to the Gila River Indian Community and SCIDD.

1.4 PROJECT LOCATION

The action area for the project includes the Ashurst-Hayden Diversion Dam, the headworks of the FCG Canal, the site proposed for the construction of sediment removal facilities, sites under consideration for long-term sediment disposal, and other sites affected by construction activities, including staging, stockpiling, and construction access. The Ashurst-Hayden Diversion Dam and headworks are located in Township (T) 4 South (S), Range (R) 11 East (E), Section 8 (northwest quarter) at approximately 111°14'48.482" West and 33°5'58.564" North. The proposed settling basin would be located on federally owned land in portions of T4S, R11E, Section 7, and T4S, R10E, Section 12. Lands under consideration for sediment disposal are located in T4S, R11E, Section 7, and T4S, R10E, Section 12 (Figure 1).

1.5 DECISIONS TO BE MADE

The responsible official for this Draft EA is the area manager of Reclamation's Phoenix Area Office. This official must decide whether to implement the proposed action or implement an alternative action that would meet the purpose and need. If the proposed action is implemented, SCIDD would undertake the rehabilitation and construction of Phase I project facilities and acquisition of land with funds provided by Reclamation.

1.6 PUBLIC INVOLVEMENT

1.6.1 Scoping

The CEQ defines scoping as "an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to a proposed action" (40 CFR 1501.7). Scoping, which encourages public input and helps focus the environmental impact analysis on relevant issues, is an important foundation to the NEPA process. Distribution of scoping information typically announces the beginning of the public component of the NEPA process.

A scoping notice soliciting public comment on the proposal described in this Draft EA was distributed to 79 individuals, organizations, and agencies on February 17, 2010. Reclamation also posted the scoping notice on its Phoenix Area Office website (http//:www.usbr.gov/lc/phoenix) and submitted news releases regarding the proposal to 11 news media outlets, including *The Arizona Republic* and the *Florence Reminder & Blade-Tribune* newspapers.

***Scope of Issues*.** The lead agency is ultimately responsible for determining the scope of an environmental document (36 CFR 46.235). During internal and external (public) scoping, environmental issues identified by program specialists, other agency staff, and the public helped Reclamation define the range of resource topics that are addressed in this Draft EA and served as the basis for developing mitigation. The following environmental issues were identified as a result of internal and public scoping:

- Effects to land use, including prime and unique farmland and adjoining properties (Section 3.2)
- Effects to populations defined under Executive Order (EO) 12898 (Environmental Justice) (Section 3.4)
- Effects to cultural resources (Section 3.5)
- Effects to Indian Trust Assets (Section 3.6)
- Effects to water resources (Section 3.8)
- Effects to floodplains (Section 3.9)
- Effects to biological resources, including invasive species and special status species (Section 3.10)

- Effects to riparian zones and wetlands (Section 3.11)
- Effects to air quality (Section 3.13)
- Effects to environmental resources from use of hazardous materials during construction (Section 3.14)

Agency responses received during the scoping process are included in Appendix A.

2.0 DESCRIPTION OF ALTERNATIVES

This chapter describes the alternatives considered for the project—the no action alternative, the proposed action, and other alternatives considered but eliminated.

2.1 NO ACTION

Section 102(2)(E) of NEPA requires that no action must be considered as an alternative in an environmental review whenever there are unresolved conflicts about the proposed action with respect to alternative uses of available resources. A description of no action is also customarily used to provide the baseline for comparison of environmental effects of the action alternatives against conditions that are representative of the status quo.

For the purpose of this analysis, the no action alternative assumes that the Ashurst-Hayden Diversion Dam and associated headworks would not be rehabilitated and the proposed sediment management and storage facilities would not be constructed. However, because the AWSA mandates the rehabilitation of off-reservation components of the SCIP, the no action alternative assumes the future lining of the canals with concrete. Because it is more difficult to remove sediment from a lined canal and there is a risk of damaging the lining in the removal process, the no action alternative would need to incorporate a more active program of sediment removal, compared to the existing condition. Therefore, the segment of the FCG Canal immediately downstream of the Ashurst-Hayden Diversion Dam (the upper reach) would remain unlined with the no action alternative in order to encourage deposition of coarse sediment, which would then be removed by dragline and stored on existing Federal land near the diversion dam.

Under the no action alternative, existing methods of sediment removal would continue in the foreseeable future. Land available downstream of the Ashurst-Hayden Diversion Dam for long-term sediment storage would be limited to existing Federal land. The total acreage for long-term sediment storage under the no action alternative would be approximately 140 acres, which equates to an estimated 28 years of storage capacity and does not provide capacity for the full 50-year planning period.

2.2 PROPOSED ACTION

The proposed action involves the rehabilitation of the Ashurst-Hayden Diversion Dam and associated headworks, armoring of a segment of the south bank of the Gila River, and construction and operation of a sediment management and storage facility to remove and store coarse sediment. To accomplish this work, the following actions would be implemented.

2.2.1 Rehabilitation of Ashurst-Hayden Diversion Dam and Headworks

Activities proposed for the rehabilitation of the Ashurst-Hayden Diversion Dam and headworks are summarized as follows. Figure 2 identifies the location of the primary project components. Figure 3 shows an enlargement of the diversion dam and headworks, and the head of the FCG Canal.

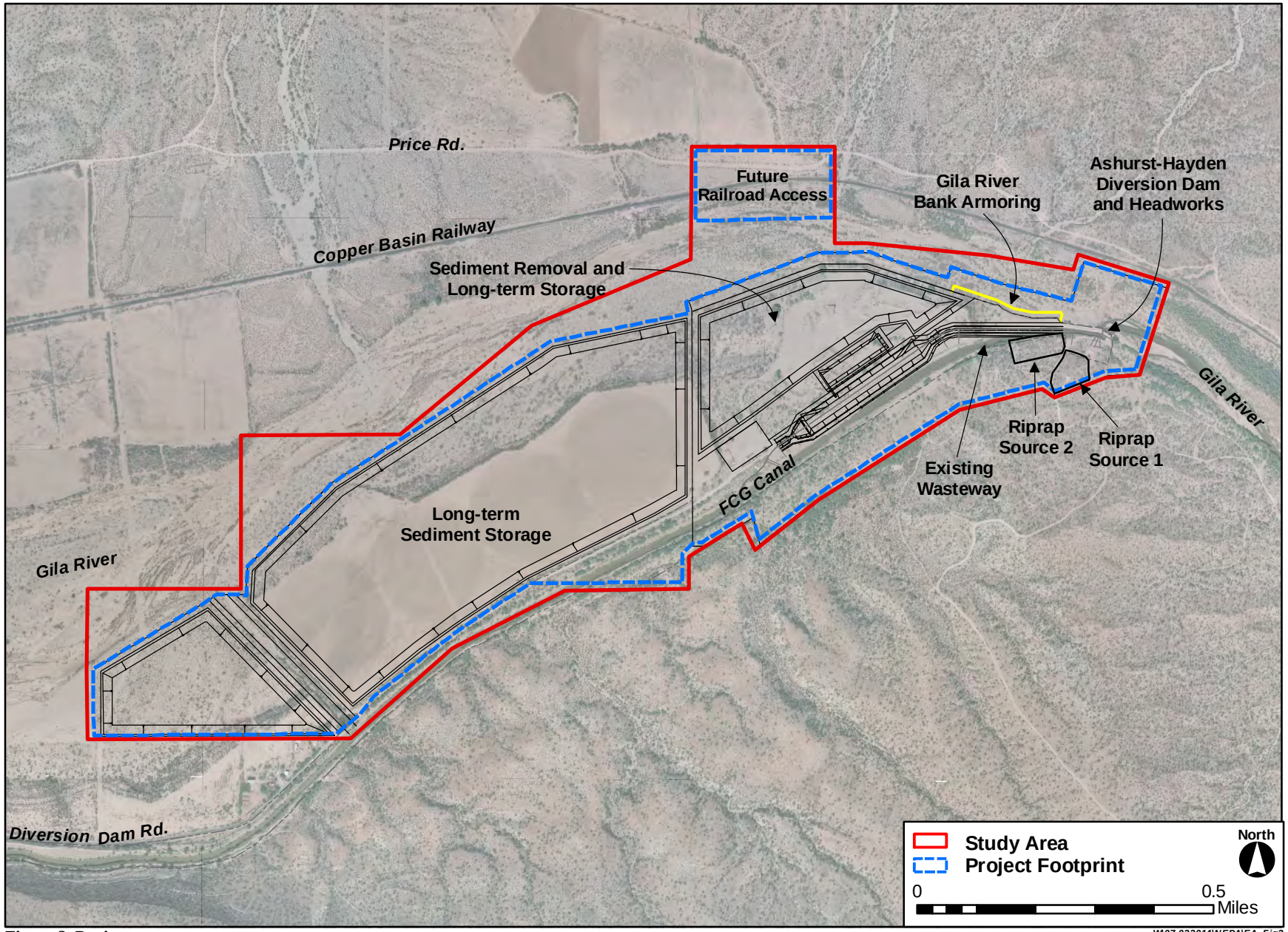

Figure 2. Project components.

Figure 3. Ashurst-Hayden Diversion Dam and headworks.

Restoration of Fuse Plug

The proposed action would replace/raise the fuse plug on the north end of the diversion dam to prevent flood flows from entering the side spillway, increasing the hydraulic head (depth of water) available to convey sediment through the sluiceway (Figure 3). The fuse plug would be designed to erode at a predictable water surface elevation to protect the dam structure.

Repair and Upgrade of Radial Gate

When there is sufficient flow in the river, the radial gate is opened to discharge flow through the sluiceway and down the Gila River, removing sediment that otherwise accumulates on the upstream side of the headworks and in the SCIP canals. The proposed action would upgrade the electric controls on the radial gate to enable remote control capability so that the entire headworks structure could be controlled in the future from an off-site control center. In addition, the bottom and side seals on the radial gate would be repaired as needed.

Inspection and Repair of Segments of Dam

A section of the dam, adjacent to the radial gate, would be inspected and repaired, as necessary, to stop water from leaking under the two previously abandoned and closed off sluice gates.

Modification of Regulation Bays

The headworks structure would be rehabilitated so that seven of the nine existing regulation bays are operable. To exclude some of the coarse sediment from entering the canal system, the sills of three of the regulation bays would be elevated by 2 feet. During flood conditions when the radial gate is open and water levels in the forebay are sufficiently high to allow diversion over the raised sills, this configuration would enable water from the forebay to be skimmed into the FCC Canal. The sills of the other four bays would remain at their current elevation and would be used to convey flow during normal operating conditions. During flood conditions, these four bays would be closed to minimize sediment intake.

New Concrete Facing and New Slide Gates

A new concrete facing would be constructed on the headworks structure spanning the seven bays and their adjacent piers. Vertical metal slide gates would be mounted on the new facing to control flow through the regulation bays. Each slide gate would be motorized. All gates would have remote-control capabilities so that the entire headworks structure could be controlled in the future from an off-site control center.

Removal of Inoperable Gates and Machinery

Rehabilitation would entail removal of the inoperable flap gates and associated hydraulic machinery. Following removal, the equipment bays on the downstream side of the headworks would be closed off from access by removing the metal walkway and sealing the points of entry.

Construction of New Deck on Headworks Structure and Adjustment in Elevation of Diversion Dam Road

Improvements to the headworks would include construction of a new concrete deck across the top of the existing deck on the headworks structure to increase stability and improve access for construction and maintenance vehicles. The elevation of a Diversion Dam Road segment that is approximately 500 feet long in the vicinity of the headworks would be raised by roughly 3 feet.

Trash Management System

Due to the impact that accumulated trash and debris have on the operation of the regulation bays, the settling basin, and downstream conveyance and control features, the proposed action includes the construction and implementation of a trash management system. The primary function of this system would be to capture and remove branches and logs of various sizes that are carried down the Gila River during normal flows and flood events. The system would consist of trash racks made of heavy steel bars mounted vertically or at a slight incline. Trash that accumulates on the trash racks would be removed using a truck crane with a grapple (claw) attachment or by an automatically operated grapple. Removed trash would be collected and trucked off-site to a state-approved landfill, as appropriate.

2.2.2 Armoring of the South Bank of the Gila River

Approximately 1,000 running feet of the south bank of the Gila River downstream of the Ashurst-Hayden Diversion Dam and headworks would be armored with riprap to protect the FCG Canal and proposed settling basin from potential flood damage. An on-site source for the material needed has been identified on existing Federal lands just south of the FCG Canal for the contractor's use. This material is somewhat fractured, but if normal ripping operations do not provide the proper material gradations, light blasting may be required. If required, all blasting would be performed in accordance with Section 24 of the latest edition of the Reclamation Safety and Health Standards. The contractor would be required to submit a blasting plan to SCIDD for review and approval prior to initiating blasting activities. Figure 2 identifies the location of the proposed armoring and the on-site source location for riprap (a rock hill labeled as Riprap Source 1 estimated at 2.0 acres and an adjacent rock ridge labeled as Riprap Source 2 estimated at 2.1 acres).

2.2.3 Construction and Operation of Sediment Removal and Storage Facility

The proposed action would construct a sediment management facility to remove and store coarse sediment (i.e., sand and coarser material) extracted from the FCG Canal. A settling basin would be used to remove the sediment. Silt and fine suspended sediments would not be removed by the Settling Basin and would continue to flow through the SCIP canal system and be deposited on Gila River Indian Community and SCIDD farmlands. The settling basin would be constructed on federally owned land along the FCG Canal immediately downstream of the diversion dam.

The Settling Basin serves as a greatly widened and deepened section of the FCG Canal that would reduce the velocity of diverted water to the point that nearly all coarse sediment would settle-out. In addition, because of its depth, the Settling Basin would retain coarse sediment so

that flood flows passing down the canal would not remobilize deposited sediment except under extreme conditions.

Two design options are being considered for the settling basin: a single-chamber settling basin with a separate dewatering basin, and a dual-chamber settling basin. The general operational approach would be the same for either concept. Water from the canal would flow at reduced velocity through the settling basin(s), causing coarse sediment to settle out. Coarse sediment would be removed using mechanical or hydraulic equipment and loaded onto trucks or a conveyor system for transport to long-term storage areas. A conceptual layout representative of the single-chamber settling basin option is depicted in Figure 4. The details of this settling basin would be determined during final design, and the concept would be evaluated for efficiency and effectiveness during the startup and operational phases. Through an adaptive management approach, the design would be modified as warranted if operations indicate another design approach would be more effective.

Extracted sediment would be moved to long-term storage areas, where sediment would be piled up to 30 feet high. To minimize the potential for erosion of stored sediment during major flood events, the storage stockpiles along the river would be armored with gravel. A physical barrier and posting of signs would be used to impede public access to the sediment piles and reduce the potential for illegal trespass. Due to the coarse nature of the sediment, the piles would not be covered.

The project would require approximately 290 acres of land for sediment management (removal and long-term storage area), associated access roads, and a site buffer based on a 50-year planning horizon. The 50-year planning horizon was used for the project because it is a typical planning horizon for major engineering works and because it coincides with the schedule for SCIDD's repayment of obligations for project construction. The area needed for these facilities/activities would be located downstream of the diversion dam and headworks on the south side of the Gila River (Figure 2). This site consists of Federal land and private land held by one landowner and used for agricultural production. Based on project estimates, the project footprint could provide up to 60 years of sediment storage.

SCIDD anticipates that some of the coarse sediment generated through removal activities would be sold to outside parties, thereby reducing the long-term storage requirement. If a demand for this sediment materializes, sediment could be trucked off-site or, if warranted, could be shipped off-site by rail. Use of the railroad would require the construction of a loading facility and associated access from the sediment management facility. Property, totaling 12 acres, would be acquired as part of the proposed action from a private landowner to allow for the future development of railroad access (Figure 2). If, at some point in the future, the market demand for sediment is sufficient to warrant rail transport, SCIDD would coordinate with ASARCO regarding the construction of a loading facility in the study area (Figure 2, Future Railroad Access). This facility would not be designed and the associated access identified until or unless there is sufficient demand for rail traffic volumes. Once a proposal has been defined and sufficient detail is available, subsequent NEPA compliance related to this action would be completed.

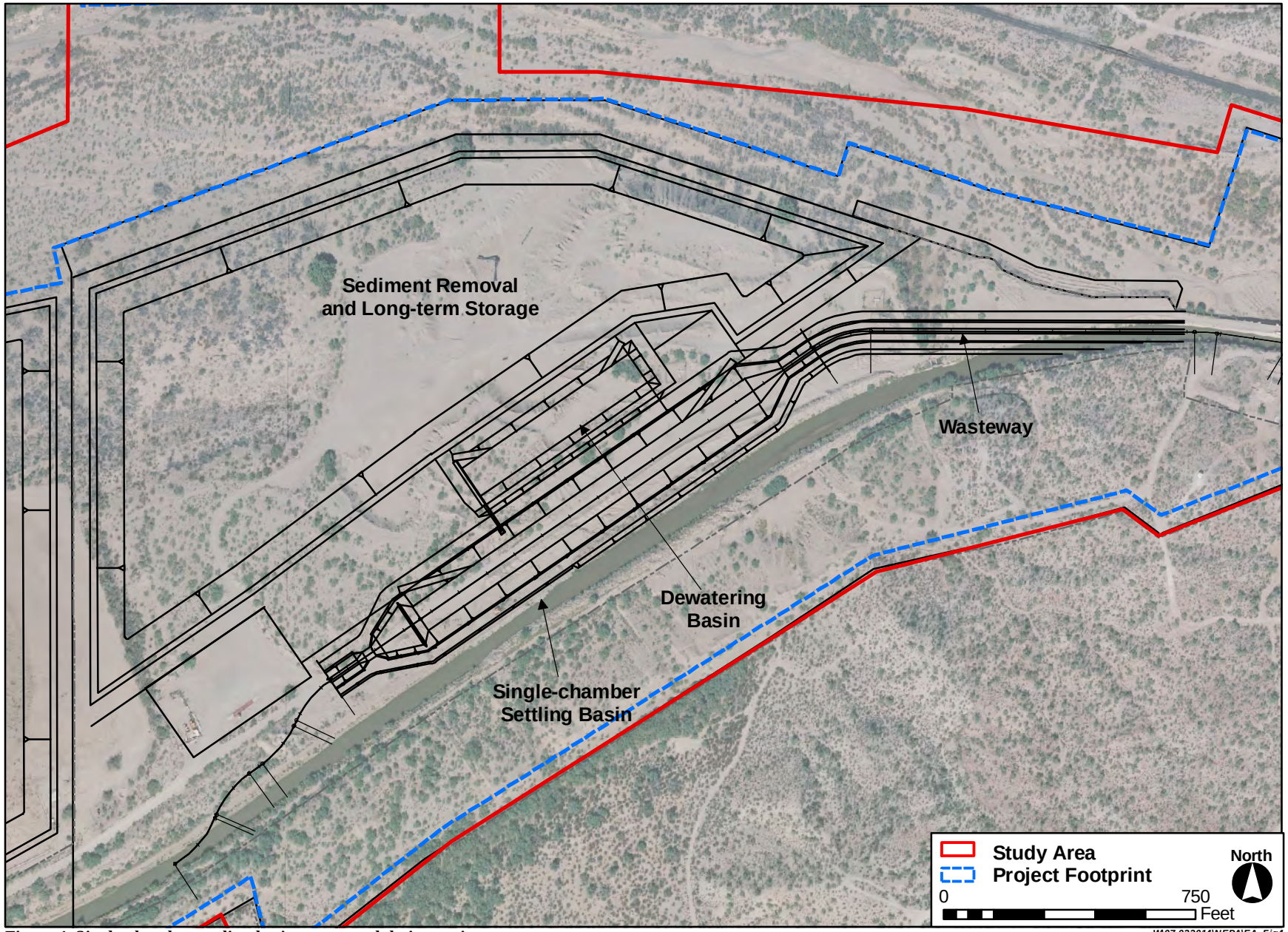

Figure 4. Single-chamber settling basin conceptual design option.

To protect against vandalism and theft and to enhance public safety, a number of measures would be employed—fencing and installing video cameras to monitor the perimeter of the settling basin and headworks structure, housing equipment in protected enclosures, equipping fenced areas and equipment enclosures with magnetic intrusion switches and alarms, placing riprap blocks or boulders to impede access across the headworks structure and protect sediment storage areas from use by off-highway vehicles, removing a walkway on the downstream side of the headworks and eliminating access to this area, and removing the catwalk on the upstream face of the headworks structure.

2.2.4 Additional Project-Related Actions

An existing electrical distribution line crosses through the area proposed for construction of the new canal segments and settling basin. Implementation of the proposed action would require the relocation of this distribution line, which currently supplies three-phase electrical power to two wells in the study area and allows motorized operation of the radial gate.

To facilitate Supervisory Control and Data Acquisition (SCADA) communications for the operations of the site, one antenna would be erected at the headworks structure, one at the settling basin site, and one associated with a repeater site. Antennas would be 15 to 20 feet in height, 4 inches in diameter, and supported in concrete foundations.

To rehabilitate the Ashurst-Hayden Diversion Dam and headworks, a cofferdam (temporary earthen dam) or sheet pile (steel wall dam) would need to be constructed within the Gila River just upstream of the dam to dewater the area of minor flows (typically 10 cubic feet per second or less) that continue during the annual dry-up. A pump would be used to move water out of the construction area.

An existing irrigation wasteway (channel) and associated gate were originally used to release excess flows from the FCG Canal to the Gila River (Figure 4). This wasteway feature is no longer needed and would be in direct conflict with two elements of the proposed action—the new canal segments and settling basin, and the armoring of the south bank of the Gila River. As part of the proposed action, the existing wasteway gate would be removed, the structure would be permanently blocked off, and the wasteway channel would be filled in.

With the proposed action, riprap material would be needed for armoring the south bank of the Gila River. This material would be excavated on-site in an area along the south side of the FCG Canal, just downstream of the headworks at Riprap Source 1 and Riprap Source 2 (Figure 2). Ripping or drilling and blasting would be required to excavate this material.

A precast concrete building would be needed to provide safe storage for specialty equipment, including the backup generator and controllers for the headwork gates, surveillance equipment, and lighting. The building would be sited on the south side of the Gila River in the vicinity of the diversion dam within the project footprint. Existing barbed-wire fencing south of the headworks would be replaced with chain-link fencing.

Construction would require equipment storage, stockpiling, and the setup of trailers for contractor offices. These areas would be located within the project footprint.

Construction vehicles and equipment would access the site using Diversion Dam Road, an existing county-owned road. Within the study area, this road is unpaved.

2.2.5 Project Construction

Some construction activities associated with the proposed action would need to be undertaken during the annual dry-up (November 1–December 13); however, other activities could be completed during the irrigation season when the FCG Canal is conveying water. Based on the amount of work that must be accomplished during the annual dry-up, it is anticipated that two seasons of dry-up, each approximately 6 weeks in duration, would be required. It is anticipated that construction would continue for 13 to 15 months. Based on a target start date in fall 2010 and an assumed construction method, a proposed schedule has been developed for construction; however, adjustments would be made to this schedule as needed. Construction is anticipated in five phases, with key activities as follows.

Preconstruction (September 1–November 1, 2010)

- Set up construction yard, temporary offices, etc., as part of contractor mobilization
- Clear and grade for relocation of electric distribution lines
- Relocate electric distribution lines
- Prepare for dry-up activities

First Year Dry-up (November 1–December 13, 2010)

- Relocate the electric distribution line
- Construct the cofferdam/sheet pile, dewater the construction area, remove the accumulated sediment in front of the headworks structure
- Prepare the face of the headworks and place the concrete face
- Inspect the two abandoned sluice bays (now part of the dam) for leakage and required repair
- Inspect the radial gate bay and sill and gate seals for required repair
- Install temporary bulkhead gates to control flow through the regulation bays during the irrigation season
- Deconstruct the cofferdam/sheet pile

Irrigation Season (December 14, 2010–October 31, 2011)

- Permanently block off or remove irrigation wasteway gate and fill in irrigation wasteway channel
- Construct the new concrete deck on the headworks structure
- Excavate the riprap material and install armoring along the south bank of the Gila River
- Construct a portion of the new canal segments, settling basin, decanting basin, and associated structures
- Install permanent sheet pile wall in road accessing the headworks

- Construct security fencing

Second Year Annual Dry-up (November 1–December 13, 2011)

- Reconstruct the cofferdam/sheet pile, dewater the construction area, remove the accumulated sediment on the upstream side of the headworks structure the dam as necessary
- Tie in the upper and lower ends of the Settling Basin to the existing FCG
- Replace/raise the fuse plug
- Repair radial gate and adjacent segment of dam at abandoned sluice bays as necessary
- Install the new metal slide gates
- Install the trash racks
- Install the trash management system
- Remove temporary cofferdam/sheet pile

Final Construction Activities (December 13, 2011, to completion)

- Complete remaining fencing
- Overlay road surface with aggregate base course
- Clean up and demobilize

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED

2.3.1 Radial Gate Alternative

To reduce seepage under the sluice gate, consideration was given to an alternative to elevate the sill of the radial gate. This would enable the gate to rest on the raised sill rather than on the accumulated sediment. Though elevating the sill of the radial gate would enable the gate to close even with sediment deposited in the sluiceway, this alternative was eliminated from consideration because it would impede movement of bed load (i.e., large particles of sediment carried along the bottom of the river) through the sluiceway.

2.3.2 Pilot Channel Alternative

Consideration was given to the construction of a pilot channel from the face of the headworks structure to a point downstream, where the channel would outfall to the Gila River. Though the pilot channel might be effective in encouraging the movement of bed load through the sluiceway, this alternative was eliminated from consideration because it would require periodic excavation of sediment from the channel, imposing additional maintenance responsibilities.

2.3.3 Slide Gate Alternatives

Two alternatives were considered to install new slide gates on the regulation bays: attaching new gates directly to the face of the existing structure and constructing a new concrete facing. The first alternative was eliminated from consideration because the existing concrete on the face of the headworks is badly deteriorated, and this method could not ensure the gates' stability and

functionality over a reasonable service life. For this reason, the alternative to construct a new concrete facing was incorporated into the proposed action.

2.3.4 Trash Management Alternatives

Three alternatives were considered for trash management: a floating trash boom, a fixed boom, and trash racks with an overhead hoisting system. The floating trash boom would be effective during normal operations and small floods. During large floods, the boom would have to be removed to protect it from damage, and the new slide gates would be vulnerable to damage from floating debris.

The fixed boom alternative (rigid deflection structure) targets moderate flows and might need to be augmented with a floating boom to function during low flows. Unlike the floating trash boom, the fixed boom would not be removed prior to large floods. Trash that lodges on the fixed boom would have to be removed during annual dry-up. The floating trash boom and the fixed boom were eliminated from further consideration because they offered no provision to remove trash and because they were ineffective under some flow levels. The third alternative, using a trash rack, grapple, and overhead hoisting system, was the only alternative that provided a means to remove the trash and would be effective through a full range of flow levels. For these reasons, the trash rack, grapple, and the overhead hoisting system was incorporated into the proposed action.

2.3.5 Long-Term Sediment Storage Alternatives

Approximately 1,000 acres of land in the vicinity of Ashurst-Hayden Diversion Dam were originally identified for long-term sediment storage (Appendix B, Figure A, Areas A, B, and C). A large proportion of this area consisted of undisturbed, high-quality Sonoran Desert—high-quality habitat for cactus ferruginous pygmy-owls and Sonoran Desert tortoises. With previously disturbed and lower-quality habitat present in the vicinity of the Ashurst-Hayden Diversion Dam, this undisturbed, high-quality habitat was eliminated from further consideration. The remaining acreage represents previously disturbed land considered more suitable for long-term sediment storage from a biological resource perspective.

Subsequently, a larger area totaling 1,850 acres was evaluated for the project (Appendix B, Figure B, Preliminary Acreage Considered). Areas of higher-quality habitat in this area were then identified and eliminated from consideration. The remaining 830 acres have been subject to previous disturbance and/or offered lower-quality habitat (Appendix B, Figure B, Initial Study Area). In consideration of engineering and operational feasibility, environmental considerations, and land availability, most of the land north of the Gila River was ultimately eliminated from consideration. The remaining 471 acres constitute the study area.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The "study area" consists of approximately 471 acres of land that would be affected by the proposed rehabilitation, land proposed for sediment removal/handling, and lands under consideration for long-term sediment storage. The term "project footprint" is used to represent all land that would be directly affected by the land acquisition, construction, and operation of the proposed project, estimated at 380 acres. The project footprint is composed of two discontiguous parts. The principal part incorporates land that would be affected by the proposed rehabilitation, sediment removal/handling, and long-term sediment storage. The smaller part straddles the railroad and incorporates land to be acquired for the potential future development of a rail spur. Figure 5 identifies the study area and the project footprint. "Project vicinity," as used in this document, refers to the area surrounding the study area, representing its proximity.

3.2 LAND OWNERSHIP, JURISDICTION, AND LAND USE

3.2.1 Affected Environment

The proposed project is located approximately 6.5 miles northeast of the town of Florence in an unincorporated area of Pinal County. Land in the study area is federally (lands withdrawn for BIA/SCIP) or privately owned. The State of Arizona holds land outside of, but in proximity to, the study area. Figure 5 depicts the general land ownership in the project vicinity.

The general character of the study area and its vicinity is rural. Though surrounding lands include large areas of native, undeveloped desert, agriculture is a predominant land use in the study area. Land devoted to agriculture varies from active cultivation to fallow fields. Ranching activities also occur in the project vicinity.

The study area encompasses approximately 3,250 linear feet of the Gila River channel. Irrigation infrastructure includes the Ashurst-Hayden Diversion Dam, the associated headworks structure, and the uppermost reach of the FCG Canal. Water wells and other structures associated with agricultural activities are also present in the study area. An overhead electric distribution line, which provides power to two wells and the headworks, crosses through the study area.

Two public vehicular transportation corridors originating at State Route 79 in the town of Florence serve the area—Diversion Dam Road (south of the Gila River) and Price Road (north of the Gila River) (Figure 1). A locked gate is installed on Diversion Dam Road to regulate access to the Ashurst-Hayden Diversion Dam. The locked segment (i.e., the easternmost end) of Diversion Dam Road is controlled by BIA/SCIP and is not open to the public.

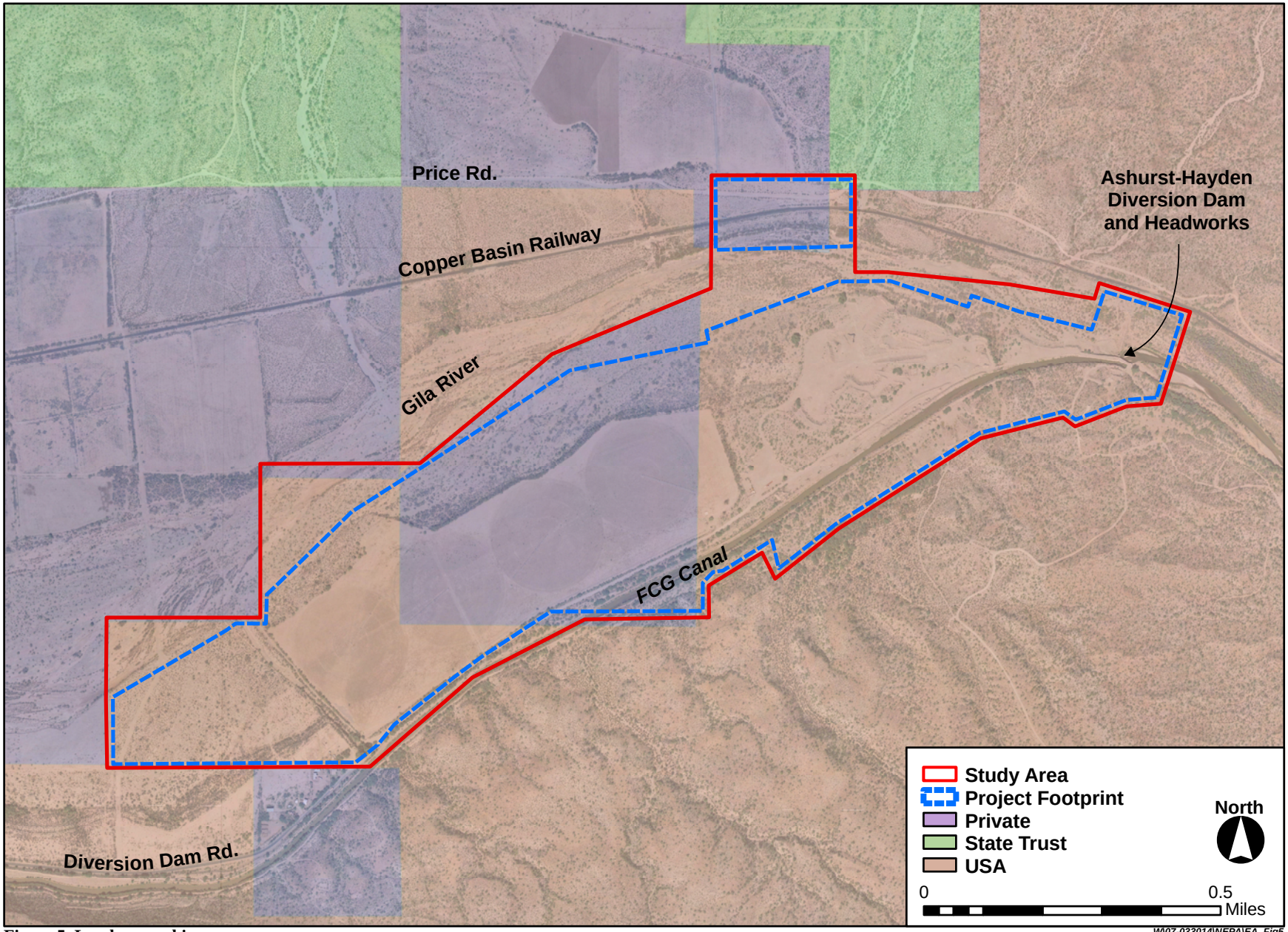

Figure 5. Land ownership.

The main line of the Copper Basin Railway, which extends from Magma to Winkelman, Arizona, traverses the project vicinity in an east–west orientation north of the Gila River and south of Price Road. The railway is owned by ASARCO, and its freight includes copper concentrates, ore, finished and unfinished copper, sulfuric acid, and lumber (Union Pacific 1994–2010).

No residential structures are in the study area. One residential structure is immediately south of the project footprint in T4S, R10E, Section 13. A second residential structure in the same area has been abandoned and is currently boarded up. A few scattered single-family residential structures are present in the project vicinity—to the west and northwest. During scoping activities, two landowners reported plans to construct residences on land north of Price Road in the project vicinity. No other future development was identified in the study area or project vicinity; however, a quarry for landscape gravel and rock is planned on uplands in T3S, R11E, Section 32, approximately 1.3 miles north of the Ashurst-Hayden Diversion Dam.

On Federal land along the FCG Canal, stockpiles of sediment are present on approximately 50 acres—the result of previous SCIP efforts to remove sediment from the headworks and canal system. A small sand operation is located on Federal land in the study area under a current lease with BIA/SCIP. This operation sells sand from the existing stockpiles of sediment.

The on-site sediment piles have attracted illegal, off-highway vehicle use to the area. Though the locked gate on Diversion Dam Road deters access, some off-highway vehicle enthusiasts gain access to the sediment piles by driving around barriers or crossing the Gila River from Price Road. Figure 6 depicts the general categories of land use in the project vicinity.

Approximately 119 acres of land in the study area has been used for agriculture (Figure 6). Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, and other agricultural crops. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. Designation of prime or unique farmland is made by the U.S. Department of Agriculture (USDA). Farmland of statewide or local importance is land, in addition to prime and unique farmlands, that is important for the production of food, feed, fiber, forage, and oilseed crops. Designation of this farmland is determined by the appropriate state or local agency.

The Farmland Protection Policy Act (FPPA) (7 CFR Part 658) governs the definition and identification of farmlands. The FPPA states that the purpose of the act is to minimize the extent to which Federal programs “contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” As defined by the FPPA, “farmland” is land that is not already in or committed to urban development. The FPPA requires that Federal agencies identify proposed actions that would affect any land classified as farmland before Federal approval of any activity that would convert farmland into other land uses. The Natural Resources Conservation Service (NRCS), part of the USDA, administers the FPPA as it relates to protection of farmland.

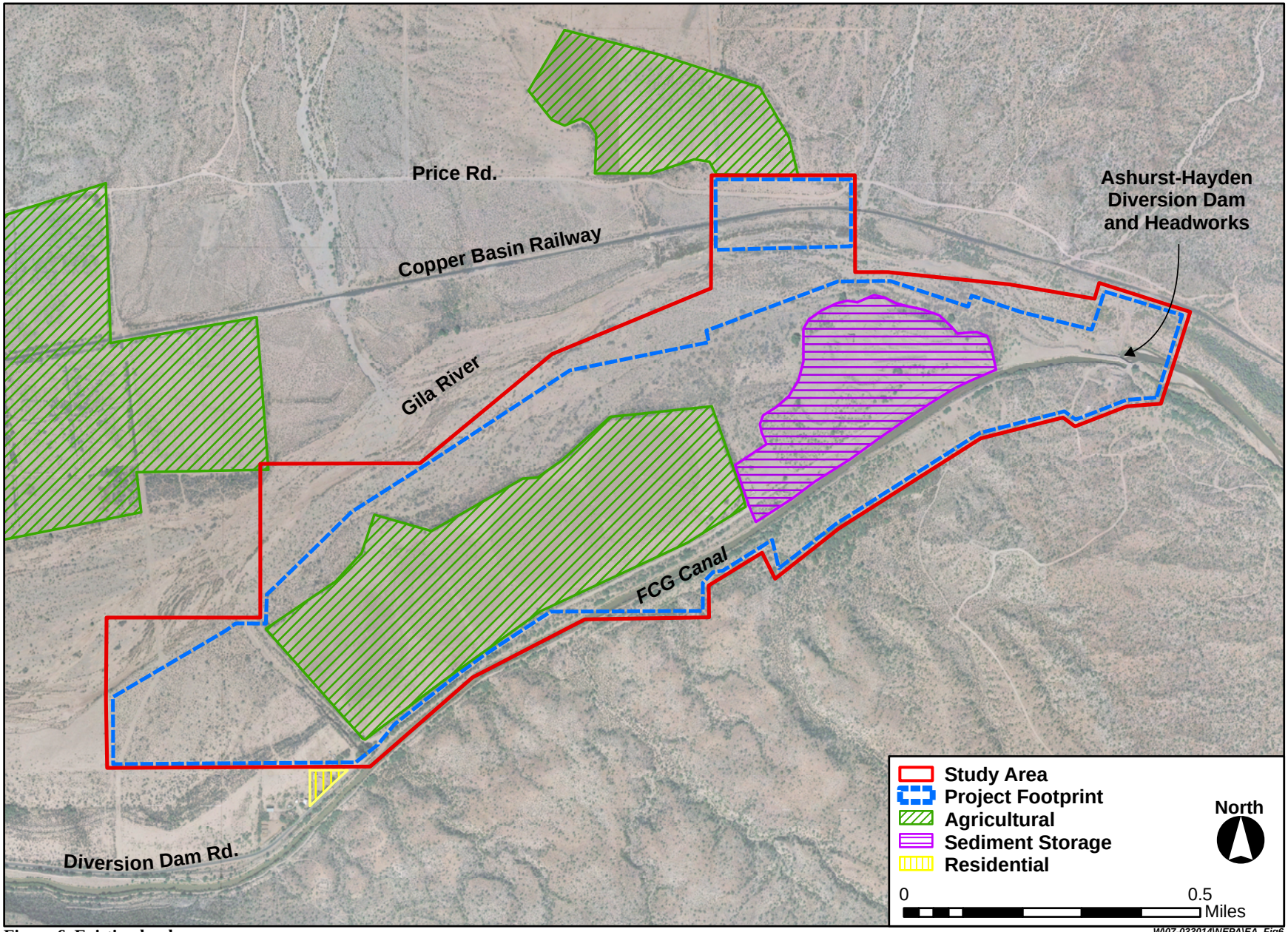

Figure 6. Existing land use.

To determine the existence of prime or unique farmland or farmland of statewide or local importance in the study area, the NRCS soil survey was used and consultation with NRCS was undertaken. The NRCS reported 6 acres of prime and unique farmland soils in the study area on irrigated farmland south of the Gila River.

No national parks, recreation areas, or designated wilderness areas; wildlife refuges; wild and scenic rivers; or other special status lands or waters are present in the study area or vicinity.

3.2.2 Environmental Consequences

No Action

Under the no action alternative, there would be no direct impact to ownership and jurisdiction because no project would be constructed or implemented. The more active removal of coarse sediment from the FCG Canal and its storage on existing Federal parcels would constitute a long-term change in land use as more acreage is committed to this use. It is assumed that there would be no change in existing patterns of land ownership or land use and that current management and operation of SCIP facilities in the study area would continue.

Proposed Action

Under the proposed action, existing Federal land under the jurisdiction of the BIA/SCIP would satisfy more than 60 percent of the project's land requirements. To satisfy the remaining requirements, private land would be acquired by SCIDD from two property owners: 125 acres on the south side of the Gila River and 12 acres on the north side of the Gila River. This land would be transferred to the BIA/SCIP sometime following construction of the project. The implementation of the proposed action may also require relocation of the on-site sand operation out of the immediate area of construction.

Most of the private land in the study area is used for agricultural production. The proposed action would require the acquisition of a farm operation and would ultimately result in the conversion of farmland to sediment management activities, including long-term sediment storage—a direct and permanent impact. Of the existing Federal land in the study area, 28 acres are leased for agricultural production. Through a leaseback arrangement, agricultural property acquired could be used for agricultural production until such time as it is needed for sediment storage.

The proposed action would ultimately convert 6 acres of prime farmland to other uses. Taken in context, this acreage represents only 0.006 percent of the land currently available for agricultural production in the SCIP service area (95,546 acres, not including approximately 5,000 acres of land permanently removed from agricultural production).

The long-term storage of sediment would result in sediment piles similar in character and height to those that exist today in the study area. Designed to accommodate the storage of sediment extracted over a 50-year period, the proposed action would result in a substantial increase in land committed to sediment storage in the study area. If a demand is identified in the future, some of the sediment removed from the FCG Canal would be sold to outside parties for use in construction and other applications off-site, which would reduce the storage requirement.

The expansion of sediment storage with the proposed action would be expected to enhance the site's attraction to off-highway-vehicle enthusiasts. Use by off-highway vehicles would create a public nuisance, including unwanted noise, dust, and the potential for illegal trespass on adjoining private lands. A physical barrier and posting of signs would be used to discourage public access to the sediment piles and indirectly reduce the potential for illegal trespass of private lands. More stringent measures may have to be considered if OHV use continues.

The proposed action would not directly result in residential displacement because no residences are located within the project footprint. One occupied residence is located on lands adjoining land proposed for long-term sediment storage. Views from this residence (see Section 3.3, Visual Resources) and the value of this property for residential use could be impacted with the storage of sediment in its proximity. The level of impact would be dependent on the juxtaposition of these sediment piles to the residence as well as the future status of the trees that today partially screen views of the proposed sediment storage area. Sediment storage would not be expected to extend into this area for at least 30 years.

If sediment is sold in the future for use off-site, truck traffic on Diversion Dam Road could increase for transporting the sediment to markets. The volume of truck traffic generated would be a function of future market demand over time and cannot be estimated as part of this Draft EA. If at some point in the future, the market demand for sediment is sufficient to warrant rail transport, SCIDD would coordinate with ASARCO regarding the construction of a loading facility in the study area (Figure 2, Future Railroad Access). This facility would not be designed until or unless there is sufficient demand for rail traffic volumes. At that time, access would be identified from the sediment management area to the railroad. Depending on demand, truck and rail traffic could be used to transport sediment off-site.

Construction activities would result in a temporary increase in truck traffic on Diversion Dam Road for the transport of construction materials and equipment to the site. Construction activities would not affect access to the project site or adjacent properties and would not be expected to interfere with traffic flow on public roads; therefore, the proposed action would have no effect on emergency response to the area.

It is anticipated that trucks would operate on-site during the operational phase to transport sediment from the settling basin to long-term sediment storage areas. A minor number of truck trips on Diversion Dam Road could also result from the potential removal of trash and debris retrieved from the headworks structure. No permanent changes in access would result from implementation of the proposed action.

The potential increase in truck traffic on Diversion Dam Road to transport sediment to off-site markets would be cumulative to farm and other local traffic. The conversion of prime farmland would be cumulative to past, present, and future farmland conversions, which have resulted primarily from residential and urban development in the region.

Mitigation

- A physical barrier and posting of signs would be used to impede public access to the sediment piles and reduce the potential for illegal trespass. More stringent measures may have to be considered if OHV use continues.

3.3 VISUAL RESOURCES

3.3.1 Affected Environment

This section addresses the impacts of the project on the overall appearance of the study area as well as scenic vistas from public vantage points. The perceived sensitivity level of a particular vantage point must also be considered. Residential land use, for example, is considered to have a higher visual sensitivity level than agricultural production.

From the vantage point of the river valley in the center of the study area, the foreground views are dominated by a usually dry reach of the Gila River, its associated riparian scrubland vegetation, the Ashurst-Hayden Diversion Dam and headworks, the FCG Canal, and cropland. Views of the existing sediment piles are prevalent along the FCG Canal near the diversion dam. An overhead electrical distribution line crosses the study area between the Gila River and the canal, creating a vertical element on the landscape. The scenic quality of the natural landscape in this area has been substantially altered by human activity and agricultural development.

Midground views extend to the gently rolling hills that surround the study area. These midground views highlight higher-quality undisturbed natural landscape but include scattered agricultural land and associated infrastructure. The undisturbed desert in this area supports dense vegetation representative of the Sonoran Desert and introduces landform, texture, and color to the landscape.

Background views consist primarily of rolling hills of primarily undisturbed native desert to the north and south. A striking view corridor extends to the east, providing panoramic views[1] of the Gila River, North Butte, and South Butte. This view corridor introduces notable visual contrast to the landscape and is considered high scenic quality.

3.3.2 Environmental Consequences

No Action

Under the no action alternative, impact to visual resources would be limited to the expansion of sediment storage piles from a more active program to remove coarse sediment from the FCG Canal. Changes in visual character and scenic quality would be minor.

Proposed Action

Implementation of the proposed action would further detract from the study area's rural character on the south side of the Gila River by intensifying existing and introducing newly built elements into the visual setting. Though the character of the proposed construction and sediment storage would be similar to the existing built environment in the study area, the extent and intensity of the built environment (including sediment piles) would increase, causing a moderate degradation in scenic quality.

[1] A panoramic view can be defined as "an unobstructed but not empty foreground between the viewer and the subject" of interest (Du Toit et al. 1993).

Viewscape is “a visual connection that occurs between a person and the spatial arrangement of landscape features” (Du Toit et al. 1993). For the proposed action, the most important viewscape is from residential properties in the project vicinity.

The project element with the greatest potential to impact scenic quality would be the increase in long-term sediment storage because of the vertical nature (height) of the storage piles and their horizontal extent (number of acres). The degree of impact would be dependent on such considerations as the sensitivity level of the viewer, the viewer’s existing setting and viewscape, and the storage pile’s distance and visibility from the viewer’s vantage point. The closest residential parcel adjoins a portion of the project footprint proposed for sediment storage. Though sediment would not be stored on adjacent lands for up to 30 years, based on project estimates, at the end of the 50-year planning period, assuming no sediment is sold and transported off-site, the proposed project could result in a negative impact on the viewscape from the associated residence due to the height and proximity of the storage piles and their extent along the perimeter of the parcel. Existing rows of trees are located north and east of this residence on Federal land. If these trees are protected and the limits of the long-term sediment storage area do not extend into or beyond these trees, the trees would be expected to screen views of the sediment piles, reducing the visual impact. If, however, the long-term sediment storage must extend into the area of the existing line of trees, a new vegetative screen would be established to reduce the visual impact.

Several other actions proposed for the study area have the potential to affect visual character or quality. Excavation (ripping and, if required, blasting) to quarry riprap would result in the removal of vegetative cover and a reduction in the landform of a small hill, referred to in this Draft EA as Riprap Source 1, and an adjacent ridge, referred to as Riprap Source 2. Both areas are south of the FCG Canal (Figure 2).

Other actions that would alter the visual setting include the stabilization of a segment of the south bank of the Gila River with riprap and the stockpiling of trash removed from the headworks to be trucked off-site. The construction of a new building and the installation of SCADA communications antennae would result in new vertical elements on the landscape; however, these additions would be consistent with the existing setting and would contribute to only a minimal change in visual quality. The rehabilitation of the Ashurst-Hayden Diversion Dam and headworks would not affect the scenic character or scenic quality of the study area.

With the exception of the impact on views from the adjoining residential structure, visual impacts of the proposed action would be minor because the sediment would be stored along the Gila River in an area currently used to store sediment or previously developed for agriculture—an area of lower scenic quality. The intensification of built elements and the creation of long-term sediment storage would be cumulative to past, present, and future development in the study area.

Mitigation

- The geographic extent of excavation for riprap would be limited to only that area required to provide the quantities necessary for bank stabilization. Excavation of riprap would be initiated at Riprap Source 1, as depicted in the project plans. Riprap Source 2 would only be used if sufficient material could not be generated from Riprap Source 1.

- If the sediment storage extends into the area of the existing line of trees as noted on the project plans, a dense vegetative screen of velvet mesquite (*Prosopis velutina*) would be established along the perimeter of the property to obscure views of the sediment piles.

3.4 ENVIRONMENTAL JUSTICE

3.4.1 Affected Environment

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied benefit of, or subjected to discrimination under any program or activity receiving Federal financial assistance on the basis of race, color, national origin, age, sex, and disability. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs that Federal programs, policies, and activities do not have disproportionately high and adverse human health and environmental effects on minority and low-income populations.

The study area consists of agricultural and undeveloped land. No protected populations are in the study area. The project vicinity is sparsely populated with single-family dwellings and agricultural properties. Data from the 2000 U.S. Census were used for the analysis of environmental justice concerns for minority and low income (below the 1999 poverty level of $16,700 for a family of four) populations. Two Census Tracts (CTs) cover the study area and vicinity: Block Group (BG) 3, CT 2.03 and BG 2, CT 8. Census data for these two census tracks were compared to those of Pinal County as a whole. Though the percent minority is moderately higher for CT 8 (48.2 percent) than that of the County (41.2 percent), the difference would not be considered meaningfully higher. The percent minority for CT 2.03 (30.7 percent) and the percent low income for CT 2.03 (0 percent) and CT 8 (8.2 percent) are notably lower than that of the county (U.S. Census Bureau 2000). Based on these data, no concentrations of minorities or residents below the poverty level were identified. No populations protected by EO 12898 are present in the study area or vicinity.

3.4.2 Environmental Consequences

No Action

Under the no action alternative, there would be no impact on populations or communities defined under EO 12898 due to their absence in the study area. With the exception of the expansion of sediment storage piles, existing conditions would be expected to continue into the foreseeable future.

Proposed Action

Because there are no protected populations in the study area or proximity, the proposed action would not result in a disproportionate effect on populations protected under EO 12898.
No cumulative effects to EO 12898 would occur as a result of the proposed action.

Mitigation

No mitigation is proposed.

3.5 CULTURAL RESOURCES

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant and to retain sufficient integrity to convey that significance are termed "historic properties" and are afforded certain protections in accordance with state and Federal legislation. The National Historic Preservation Act (NHPA) defines historic properties as sites, buildings, structures, districts, and objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), as well as the artifacts, records, and remains related to such properties. "Traditional cultural properties" (including sacred sites) having heritage value for contemporary communities (often, but not necessarily, Native American groups) also can be listed in the NRHP because of their association with historic cultural practices or beliefs that are important in maintaining the cultural identities of such communities.

Section 106 of the NHPA requires Federal agencies to take into account the effects of their activities and programs on NRHP-eligible properties. Regulations for *Protection of Historic Properties* (36 CFR Part 800), which primarily implement Section 106, were most recently amended in 2004. These regulations define a process for responsible Federal agencies to consult with the State Historic Preservation Office (SHPO), Native American groups, other interested parties and, when necessary, the Advisory Council on Historic Preservation (ACHP) to ensure that historic properties are duly considered as Federal projects are planned and implemented.

3.5.1 Affected Environment

The following sections describe relevant culture history and enumerate cultural resources recorded in the study area.

Culture History

Prehistoric cultural remains that may be encountered in the middle Gila River Valley primarily represent remnants of the archaeological culture called the Hohokam. Because of the complex geomorphological context in the project vicinity, however, the possibility exists for discoveries dating to the earlier Paleoindian and Archaic horizons. Proximity to the Gila River Indian Community also means that evidence of Akimel O'odham (Pima) and/or Piipaash (Maricopa) use of the area may be present. The general area also has been settled and used by non-aboriginal Historic Period peoples, including miners in the mountains to the northeast and east, and ranchers and farmers in the river valley. Several recent detailed cultural histories have been prepared for the middle Gila River Valley (Florie and Fangmeier 2009; Florie and Luhnow 2009; Schilling et al. 2009a, 2009b) and others (Craig 2001, Woodson 2000). What follows is a brief discussion of the current understanding of the culture history of the Phoenix Basin/Middle Gila River Valley.

Prehistoric Period

The Paleoindian Period (10,000–7500 B.C.) represents the earliest well-documented human occupation of North America. Paleoindian lifeways were based on small, nomadic bands that hunted megafauna and gathered wild plants. Numerous sites from this period have been found in southern Arizona (Cordell 1984; Haury 1950; Huckell 1982, 1984), but evidence for Paleoindian period occupation farther north is sparse and largely limited to isolated projectile points

(e.g., Crownover 1994; North et al. 2005). No Paleoindian sites have been reported in the project vicinity.

The Archaic period (7500 B.C.–A.D. 300/500) is divided into Early, Middle, and Late. Early Archaic (7500–4800 B.C.) people followed a generalized hunter-gatherer lifeway and employed a subsistence-settlement strategy involving high residential mobility, annual procurement rounds, and a wide interaction sphere. By the Middle (4800–1500 B.C.) and Late Archaic (or Early Agricultural) (1500 B.C.–A.D. 300), populations began settling in semi-permanent and/or permanent villages of circular pit houses where inhabitants focused on cultivating maize and foraging for wild plants (Huckell 1990, Mabry et al. 1997, Roth 1992). Substantial Archaic occupations have been reported from east-central and southern Arizona and the Tucson Basin (e.g., Bayham et al. 1986, Doyel 1993, Huckell 1990, Mabry and Archer 1997, Matson 1991, Roth 1992, Whalen 1971). Though few Archaic sites have been found in the project vicinity, several have been recorded farther downstream.

Three general periods of growth and change for the Hohokam are recognized (Doyel 1979, Haury 1976). First, there is an early period, which witnessed the development of agriculture and pottery, and the establishment of settled villages, leading to a sedentary lifestyle (Cable and Doyel 1985, Doyel 1993, Wilcox et al. 1981). These developments are subsumed under the heading of the Formative (Pioneer) period, which dates between ca. A.D. 1 and A.D. 700. The Late Formative (Colonial and Sedentary) period (700–1050) is characterized by the development of irrigation systems, large villages, ornate arts and crafts industries, public architecture such as ball courts and platform mounds, formalized mortuary ritual, and geographic expansion (Gregory 1987, 1991; Wilcox and Sternberg 1983). The final or Classic period (1050–1350) witnessed the further expansion of irrigation systems in some areas, shifts in settlement patterns and architectural styles from pit houses to above-ground walled villages, significant changes in pottery and craft assemblages, shifts in burial patterns, and the reorganization of exchange networks (Downum and Bostwick 2003, Doyel 1981, Gregory 1987, McGuire and Howard 1987).

A Post-Classic Polvorón phase has been proposed for the period between A.D. 1350 and 1450/1500 (Crown and Sires 1984, Sires 1984), but the validity of the phase is still the subject of some debate (e.g., Andresen 1985, Bostwick et al. 1996, Chenault 2000, Doyel et al. 1995, Henderson and Hackbarth 2000, Zyniecki 1996). Polvorón phase components suggest a decline in complexity and a trend toward more egalitarian, possibly household-based social organization. Evidence for large-scale irrigation and organized ritual disappears, and the distribution of sites suggests varied subsistence strategies. The phase is characterized by a return to pit house architecture, low frequencies of buffware ceramics, high frequencies of Salado polychrome and red ware, and an apparent increase in obsidian use, suggesting a reorganization of trade networks. Polvorón phase components have been identified at many sites in the Lower Salt and Middle Gila river valleys (Andresen 1985; Bostwick et al. 1996; Chenault 1996, 2000; Doyel 1991; Doyel et al. 1995; Henderson and Hackbarth 2000; Sires 1987; Zyniecki 1996) but have yet to be found in areas to the south.

Historic Period

Beginning in the 1600s, the Spanish maintained loose control of the region that would become Arizona until 1821 when Mexico gained its independence. In the brief period of Mexican control

(1821–1848), the non-aboriginal population in northern Sonora and southern Arizona was sparse; many of the Sonoran missions were abandoned or severely depleted. Settlements in southern Arizona were essentially limited to the isolated presidios of Tubac and Tucson. In 1848, much of what is now southern Arizona became part of the United States through the Treaty of Guadalupe Hidalgo. The remainder was acquired through the Gadsden Purchase in 1853. Little Euroamerican activity occurred in the territory until the 1848–1849 discoveries of gold in California, when speculators began traveling in larger numbers across the territory to reach the West Coast. Conflict between the Native Americans—especially the Apache in the project vicinity—and Euroamerican miners and settlers was inevitable. Despite a government policy of peaceful negotiations, soldiers and settlers embarked on hostile campaigns against the Apache. Retaliation by Apache-Yavapai coalitions throughout central Arizona led to the establishment of Fort McDowell on the lower Verde River in 1865. Eventually, Euroamerican settlers could count on a defensive line of forts stretching throughout the Apache-Yavapai territories, from Prescott to present-day Silver City, New Mexico (Spicer 1986).

Development of the middle Gila River Valley was slow, even after the Apache were relocated to their present-day reservations, because of a limited water supply. The initial development (1860s) to completion (1880s) of the original Florence Canal system took virtually all of the water from the Gila River at the expense of downstream Pima and Maricopa farmers on the Gila River Indian Community (Introcaso 1986:8–11). A new Florence canal system was built in the 1880s (Baldwin 1941:43–46) comprising an enlarged main canal that extended 15 miles south of Florence to a basin known as the Picacho Reservoir. Another canal was extended west to irrigate lands southwest of Florence, including the Casa Grande Valley. Flood damage and financial problems hindered the canal company's ability to properly maintain the system, however, and by 1900, the initial irrigated acreage had not been substantially expanded over the acreage irrigated in the 1800s (Pima-Maricopa Irrigation Project ca. 2002b).

The San Carlos Project

The fertile soil of the middle Gila River Valley was considered the greatest resource of Pinal County, but the biggest concern was how to deliver water to the area. Since the 1890s, the people of Florence and Casa Grande, as well as others who had an interest in developing the region, had been promoting plans for building the San Carlos Project. This proposed irrigation system required construction of a dam on the Gila River near the Apache Agency at San Carlos to store the floodwaters that typically washed through the valley every spring (Introcaso 1986:28–29). The passage of the National Reclamation Act of 1902 raised hopes of getting Federal funding for the project, but Pinal County was unable to compete successfully against the Salt River Valley, where extensive farmland had already been developed. Therefore, while the Salt River Project was funded, the San Carlos Project continued to be just an idea.

Federal projects on the Gila River Indian Community had focused on developing groundwater and capturing floodwaters, but these proved to be ineffective, supplying little water, though the Federal government had promised to provide enough to irrigate 50,000 acres (Pima-Maricopa Irrigation Project 1999). Initially, non-Indian interests opposed allowing the reservation to receive *any* surface water from the Gila River and instead promoted more groundwater development, even suggesting that tribal lands be sold to pay for the project (Introcaso 1986:36–42).

Casa Grande Valley farmers eventually changed their views, however, and recognized that a combined effort to supply the reservation with water as well as to bring irrigation to new private lands might be the best approach to securing Federal funding. At that time, the San Carlos Project was promoted as a means to supply water for 40,000 acres on the reservation and 55,000 acres of non-reservation lands (Introcaso 1986:50–52; Pima-Maricopa Irrigation Project ca. 2002a). Senator Henry Ashurst and Representative Carl Hayden introduced the bill for the San Carlos Project in both houses of Congress in 1914. It would provide money to build the dam at San Carlos and a diversion dam above Florence, as well as cover the cost of lining canals with concrete to cut the loss of water from seepage. The bill had the support of Pinal Mutual Irrigation (successor to the Florence Canal Co.) and the Casa Grande Valley Water Users' Association, but it was not passed. Nonetheless, Ashurst and Hayden were successful in getting an appropriation in 1916 to build the Florence Diversion Dam, the first component of the planned irrigation system. In 1915, the current FCG Canal was dug east of, and parallel to, the old Florence Canal, and the Pima Lateral from it flowed west to supply the Gila River Indian Community during times when the flow in the river channel was too low. Construction of the diversion dam began in 1921 and was completed in 1922. The dam was dedicated on May 10, 1922, when it was renamed the Ashurst-Hayden Diversion Dam. Construction of the Sacaton Diversion Dam was then initiated farther downstream; that diversion structure was completed in June 1925.

By the mid-1920s, the Federal government had a considerable investment in water development in Pinal County, but the Gila River Indian Community was still not receiving an adequate supply of water, so in 1924 Congress approved the San Carlos Act, which authorized construction of a storage dam and reservoir (Introcaso 1986:53–55). Construction was completed in 1929, and two distinct organizations were formed to manage the distribution of the water: the Indian Works served the Indian lands and SCIDD provided water for non-Indian lands. By the time the San Carlos (now Coolidge) Dam and reservoir were completed, however, an extended drought curtailed the total amount of water flowing through the watershed, and the reservoir never filled as anticipated. As a result, SCIDD started relying on pumping groundwater from wells along the canal for a considerable portion of the water needed for irrigation (Introcaso 1986:87). Nevertheless, the overall impact for central Pinal County was significant. Within the 10-year period from 1928 to 1938, irrigated land nearly doubled from 75,000 to 132,000 acres (Weisiger 1995:36).

As a result of a steadier supply of water for irrigation, the existing towns grew, and new settlements were established. The existing and new agricultural towns, including Coolidge, Randolph, La Palma, and Eloy, were linked by transportation networks to facilitate movement of produce. Smaller agricultural centers were established near cotton gins. Land speculation was rampant leading up to the Great Depression; the irrigated land in Pinal County doubled from 150,000 acres in 1920 to nearly 300,000 in 1930 (Keane 1991:270). Through the 1930s, most new agricultural lands that were being developed in Arizona were located in Pinal County, though agricultural development was proceeding at a slower pace than had been the case earlier, and most were irrigated with pumped groundwater (Sheridan 1995:217–219). In 1950, the permanent workforce in the county was 12,000, but that number more than doubled each year as migrant farm workers arrived for the fall cotton harvest (Arizona Employment Security Commission 1955:2, 6) After 1960, however, fewer laborers were employed (LeSeur 2000). Agriculture continues to dominate the economy of Pinal County.

Cultural Resources in the Study Area

An intensive (Class III) cultural resource survey, accomplished with pedestrian transects spaced no more than 15 meters apart, was completed for the study area (Schilling and Stokes 2010), which is identified as the area of potential effects (APE). The APE is the area within which historic properties could be affected either by physical disturbance or by visual, auditory, or atmospheric disturbances that might alter the characteristics that contribute to the properties' eligibility for NRHP listing. In total, 11 cultural properties and 35 isolated occurrences were recorded. The isolates do not meet Arizona State Museum (ASM) archaeological site criteria and are not considered significant; mapping and field recording have exhausted their information potential. Table 1 enumerates the 11 cultural properties, which include two prehistoric properties, eight historic-age properties, and one property with multiple temporal components.

In the early 1990s, Reclamation prepared two documents on the SCIP. The first was an overview and evaluation of significance of the SCIP (Pfaff 1994). This was followed by a Historic American Engineering Record (HAER) (Pfaff 1996) that served as mitigation for the planned future rehabilitation of the SCIP Joint Works facilities. The Arizona SHPO accepted the draft HAER document (Appendix C, letter dated October 3, 1995) and the National Park Service accepted the final HAER document (Appendix C, letter dated April 18, 1996). Reclamation met with the Arizona SHPO prior to the initiation of the proposed Phase I rehabilitation project regarding the HAER documentation. The only concern expressed by SHPO was the status of the China Wash Flume on the FCG Canal, which is not part of the proposed Phase I project.

Table 1. Cultural resource summary and management recommendations.[2]

Designation/Name	Property Type	Eligibility Status	Management Recommendations
AZ U:15:1 (REC) ACS-3	Hohokam artifact scatter/possible habitation	Recommended eligible under Criterion D	Avoidance or data recovery
AZ U:15:2 (REC) ACS-4	Historic irrigation ditch and related features	Undetermined eligibility	Additional archival research for eligibility assessment
AZ U:15:8 (ARS)	Multicomponent: historic trash scatter and prehistoric chipped stone scatter	Previous recommendation unknown; recommended not eligible	No additional cultural resource work
AZ U:15:3 (REC) ACS-6	Hohokam artifact scatter	Recommended not eligible	No additional cultural resource work
AZ U:16:299 (ASM) Mesa to Winkelman Spur, Southern Pacific Railroad	Historic railroad	Concurred to be eligible by SHPO under Criterion A; current segment recommended as a contributing element	Avoid or treat in accordance with Secretary of the Interior's Standards for Rehabilitation
AZ U:16:303 (ASM) Ashurst-Hayden Diversion Dam Maintenance Facility	Historic buildings and structures	Previously recommended as eligible under Criterion A; recommended as still contributing under Criterion A and possibly C	Avoid or additional archival research, documentation for Feature 15

Table 1. Cultural resource summary and management recommendations.[2]

Designation/Name	Property Type	Eligibility Status	Management Recommendations
AZ U:15:4 (REC) ACS-9	Historic trash scatter	Recommended not eligible	No additional cultural resource work
AZ U:15:5 (REC) ACS-10 Diversion Dam Road	Historic road	Recommended not eligible	No additional cultural resource work
AZ U:15:6 (REC) ACS-11 Price Road	Historic road	Recommended not eligible	No additional cultural resource work
AZ U:15:7 (REC) ACS-12	Historic utility line	Recommended not eligible nor contributing to the SCIP system	No additional cultural resource work
AZ AA:3:215 (ASM) FCG Canal, Ashurst-Hayden Diversion Dam and associated features	Historic canal, diversion dam and associated features	Concurred eligible by SHPO, HAER document completed for canal and dam (Feature 1); Feature 2 recommended as contributing under Criterion A and possibly C	Archival research, possible Historic Property Inventory Form documentation on Feature 2 to clarify its history and possible eligibility under Criterion C

[2] Properties identified as "determined" eligible or not eligible are those for which consultation by a Federal or state agency with SHPO has occurred. Properties identified as "recommended" eligible or not eligible are those for which consultation has yet to occur. The listed recommendations are those of the properties' recorder, in this case, Archaeological Consulting Services, Inc. (ACS).

3.5.2 Environmental Consequences

No Action

Under the no action alternative, it is assumed that current management and operation of the diversion dam and headworks would continue and that there would be "no adverse effect" to historic properties (cultural resources listed on or eligible for listing to the NRHP) assuming that the FCG Canal and Ashurst-Hayden Diversion Dam continued to be subject to period maintenance and repair in keeping with the Secretary of the Interior's Standards for Treatment of Historic Properties.

Proposed Action

Several elements of the proposed action have the potential to affect known or possible historic properties (cultural resources listed on, or eligible for listing on, the NRHP). Restoration of the Ashurst-Hayden Diversion Dam and associated headworks, including abandonment and obliteration of the irrigation wasteway channel and modifications to the FCG Canal, could cause physical alteration to characteristics that qualify the combined properties, which have been determined NRHP-eligible under Criterion A, for NRHP listing. Development and use of the sediment removal and storage facility could cause physical alteration to archaeological site (AZ U:15:1 (REC), which is recommended NRHP-eligible under Criterion D, and which also might alter the setting of the FCG Canal and Ashurst-Hayden Diversion Dam.

Installation of antennas could cause physical alteration to characteristics that qualify the Ashurst-Hayden Diversion Dam for NRHP listing and alter the setting of the FCG Canal and Ashurst-Hayden Diversion Dam. Development of rail loading facilities could cause physical alteration

to the Mesa to Winkelman Spur of the former Southern Pacific Railroad (currently incorporated as the Copper Basin Railway), which has been determined NRHP-eligible under Criterion A and might alter the setting of the railroad.

In compliance with Section 106 of the NHPA, Reclamation would consult with Native American groups that may have interests or concerns to determine if there are traditional cultural properties or sacred sites in the APE. Reclamation would ensure that eligibility assessments of cultural resources in the study area would be made, as needed, and would consult in that regard with SHPO and other interested parties, as appropriate. Reclamation would make a determination of effect for the proposed undertaking and consult with SHPO accordingly.

Mitigation

- Reclamation would develop a Memorandum of Agreement or a Programmatic Agreement, if appropriate, that would stipulate development and implementation of a treatment plan prior to initiation of construction of the sediment basin and storage areas by SCIDD.

3.6 INDIAN TRUST ASSETS

3.6.1 Affected Environment

Indian Trust Assets are legal interests in assets held in trust by the United States for Native American tribes or individual Native Americans. These assets are held by the Secretary of the Interior as the trustee. Indian Trust Assets can include, but are not limited to, land resources, water rights, minerals, and hunting and fishing rights.

The Gila River Decree of 1935 recognized the right of the United States to demand and divert Gila River water for irrigation of 50,546 acres of Indian farmland on the Gila River Indian Community. This water right is the one Indian Trust Asset identified for this project and its study area.

The irrigation water associated with this water right is diverted at the Ashurst-Hayden Diversion Dam. The diversion dam, headworks structure, and the FCG Canal are SCIP Joint Works facilities used to divert and convey water from the Gila River to Gila River Indian Community and SCIDD lands.

3.6.2 Environmental Consequences

No Action

Under the no action alternative, the Joint Works in the study area would not be rehabilitated and a new sediment management system would not be implemented. Without rehabilitation, age-related deterioration would be expected to continue, and operational deficiencies would not be corrected.

Proper functioning of the dam and headworks would not be restored, and flow capacity of the headworks would continue to be compromised. Sediment would continue to accumulate behind the diversion dam, negatively affecting the operation of the diversion dam and the headworks. Though the proposed sediment management system would not be constructed, the no action alternative would incorporate a more active program of the removal of coarse sediment from the

FCG Canal in an effort to limit the coarse sediment that would be deposited throughout the conveyance system and on agricultural lands downstream of the study area. The land available for storing coarse sediment with the no action alternative does not provide capacity for the 50-year planning horizon. Storage capacity was estimated at 28 years. For these reasons, the no action alternative would result in a permanent and negative impact on Indian Trust Assets.

Proposed Action

With water as a primary Indian Trust Asset, consideration was given to the project's potential to impact irrigation water quality and availability. The proposed action would result in an improvement to irrigation water quality with the removal of coarse sediment at the headworks. The project would not alter Gila River water supplies available for diversion and would not interfere with irrigation water delivery.

The diversion dam, headworks, and FCG Canal are critical to the conveyance of irrigation waters to downstream Indian farmland. The proposed rehabilitation would extend the useful life of the facilities, ensuring future deliveries of available irrigation water. The proposed action would also improve the operations of the headworks, providing more control in how these waters are diverted.

The Federal lands in the study area were used to construct the diversion dam and headworks and are currently used in the operation of these facilities and the storage of coarse sediment previously removed from the FCG Canal. Construction and operation of a settling basin system and the storage of extracted sediment on this Federal land supports the purpose of the proposed action to improve water quality and delivery efficiency, and reduce long-term operating costs of the irrigation system. For these reasons, the proposed action would be expected to protect and preserve Indian Trust Assets, constituting a long-term beneficial effect.

Mitigation

Effects of the proposed action on Indian Trust Assets are considered beneficial. No mitigation is proposed.

3.7 GEOLOGY AND SOILS

3.7.1 Affected Environment

The Southern Basin and Range seismic source zone extends from Mexico into southern California and includes most of southwestern and central Arizona, including the project area. With no known history of earthquake activity, the project area is considered tectonically stable, with low levels of seismic activity and no active faults (U.S. Geological Survey [USGS] 2010). Young alluvium and alluvium with less abundant talis and eolian deposits (Arizona Geological Survey [AGS] 2000) characterize much of the study area. The rocky hills south of the FCG Canal to be used as a source for riprap appear to be composed primarily of granite in various stages of weathering.

Three soil types occur in the project area (Hendricks 1985). Soils in the eastern portion of the study area, near the Ashurst-Hayden Diversion Dam, are in the Chiricahua-Cellar Association. These are well-drained soils that formed on low granitic mountains and pediments. Runoff is

medium, and the hazard of erosion is usually slight. The soils in the central portion of the project are in the Torrifluvents Association. These are well-drained to excessively drained soils that formed in floodplains and adjacent alluvial fans that are also used as irrigated croplands. Runoff is slow, and the hazard of erosion is usually slight. The soils in the northwestern portion of the study area are in the Lithic Camborthids–Rock Outcrop–Lithic Haplargids Association. These are well-drained soils that formed in materials weathered from granitic rocks, schists, volcanic tuffs and conglomerates, basalt, and some shale and sandstone. Runoff is medium to rapid, and the hazard of erosion is usually slight.

3.7.2 Environmental Consequences

No Action

Under the no action alternative, a more active program of sediment removal would be implemented compared with the existing condition. This more active removal of coarse sediment from Gila River water at the headworks would increase the deposition of sediment in the study area, reduce the transfer of coarse sediment throughout the irrigation conveyance system, and reduce the amount of coarse sediment deposited on agricultural fields downstream. Other components of the proposed action that affect geologic resources and soils, such as the excavation of material for riprap, would not be implemented under the no action alternative.

Proposed Action

The potential for land subsidence and earth fissuring would not increase because the proposed action would not contribute to groundwater level declines. The proposed action would not likely be affected by seismic activity because of the low seismic potential in the area. The excavation (ripping and, if required, blasting) to quarry riprap would remove granite rock from two landforms (Figure 2, Riprap Source 1 and Riprap Source 2) in a 4.1-acre area within the project footprint. Excavation would also expose and loosen soils, subjecting them to wind and water erosion. If blasting is required, a permit would be obtained from Pinal County in compliance with the Pinal County Development Services Code. Blasting would be performed in accordance with this permit and with Section 24 of the latest edition of the Reclamation safety and health standards. The contractor would submit a blasting plan to SCIDD for review and approval prior to initiating blasting activities.

The removal of coarse sediment from Gila River water at the headworks would result in the deposition of sediment in the study area, reducing the transfer of coarse sediment throughout the irrigation conveyance system and reducing the amount of coarse sediment deposited on agricultural fields downstream.

Though sediment would be expected to continue to accumulate behind the diversion dam, the proposed rehabilitation of the diversion dam and headworks would improve the flow of sediment-laden water through the headworks and would reestablish a means for the periodic flush of accumulated sediment downstream of the diversion dam through the radial gate.

The proposed project would directly disturb surface soils in the project footprint as a result of the operation of large equipment and the use of trucks to transfer sediment to long-term storage areas, increasing the potential for soil erosion and sedimentation in the Gila River. Approximately 290 acres of land would be dedicated to sediment removal and storage activities.

Erosion control measures, including physical barriers and post-construction site stabilization, would be used to control storm water runoff and associated sedimentation. With the use of these measures and because of the coarse nature of the sediment piles, soil erosion and sedimentation from the sediment piles would constitute a minor but ongoing effect of project operations.

Under the proposed action, the removal of accumulated sediment from the upstream side of the diversion dam and the construction of the earthen cofferdam/sheet pile upstream of the diversion dam would result in a temporary redistribution of channel deposits in the Gila River. At the end of each of the two dry-up construction phases, the channel material would be redistributed to preconstruction conditions.

The effects of project activities on erosion and sedimentation would be incremental to historic, ongoing, and future uses that affect the Gila River, including the use of unpaved roads, OHV activity, and agricultural production.

Mitigation

- Erosion control measures and post-construction site stabilization would be implemented in the project footprint as necessary.

3.8 WATER RESOURCES AND WATER QUALITY

3.8.1 Affected Environment

The study area is located within the Middle Gila River watershed. The Gila River flows through the study area in an east to west direction. Several ephemeral washes outfall to the Gila River in the project vicinity.

The 649-mile-long Gila River originates in western New Mexico, flows generally west–southwest across the State of Arizona, and outlets in the Colorado River near the city of Yuma, Arizona. In its upper reaches, the Gila River is free-flowing. Coolidge Dam, approximately 50 miles upstream of the study area, is the only major dam on the Gila River. Stream flow within the Gila River upstream of the diversion dam is highly variable and is dependent on upstream releases from Coolidge Dam, flows from tributaries, including the San Pedro River (downstream of Coolidge Dam), and precipitation in the area. Today, releases from Coolidge Dam are based on irrigation water orders from SCIDD and the Gila River Indian Community. Except during large flood events, all of the water that reaches the Ashurst-Hayden Diversion Dam is diverted to the FCG Canal for irrigating farmland downstream; therefore, the riverbed downstream of the diversion dam is usually dry.

Water quality relates to physical and chemical properties. With regard to physical properties, a primary surface water quality problem in the study area is the sediment load in the Gila River, especially during floods events. Approximately 1,320 acre-feet of sediment (equaled or exceeded 75 percent of the time) is diverted annually into the FCG Canal at Ashurst-Hayden Diversion Dam. As a result of this high sediment load, sediment is deposited throughout the distribution system in the headworks, canals, reservoirs, and on irrigated fields within SCIP, resulting in increased operation and maintenance costs, and reduced conveyance capacities.

3.8.2 Environmental Consequences

No Action

Under the no action alternative, a more active program of sediment removal would be implemented compared with the existing condition. This more active removal of coarse sediment from Gila River water at the headworks would increase the deposition of sediment in the study area, reduce the transfer of coarse sediment throughout the irrigation conveyance system, and reduce the amount of coarse sediment deposited on agricultural fields downstream. No change in surface water flows in the Gila River downstream of the diversion dam would occur under the no action alternative.

Proposed Action

The U.S. Army Corps of Engineers (Corps) regulates the discharge of fill material to Waters of the United States (Waters), pursuant to Section 404 of the Clean Water Act (CWA), and issues permits for actions proposed within such waters. Jurisdictional, non-tidal Waters regulated by the Corps are defined in 33 CFR 328.4 (c) as those that compose the area of a water course that extends up to the ordinary high water mark in the absence of wetlands.

A preliminary evaluation for the presence of potential jurisdictional waters was conducted in the study area through a review of USGS topographical mapping, recent aerial photography, and a site visit. Based on this review, there are Waters under the jurisdiction of the Corps in the project vicinity. The Gila River, however, is the only Waters identified in the study area. A formal assessment of the Gila River's jurisdictional limits would be completed and submitted to the Corps for its formal determination.

The proposed rehabilitation of the diversion dam and headworks and the armoring of the Gila River bank would require compliance with the CWA. Sediment removal facilities and long-term storage would be sited to avoid jurisdictional Waters. Though the type of CWA Section 404 permit needed to accomplish the proposed action has yet to be determined and confirmed by the Corps, it is anticipated that the work could be authorized by the Corps' Nationwide Permit program. A preconstruction notification, or permit application, would be prepared and submitted to the Corps, and no work within jurisdictional Waters would be initiated prior to the issuance of a CWA Section 404 permit. Work within jurisdictional Waters would be completed in accordance with all terms and conditions of the permit. Compliance with CWA Section 401 would also be required. The acreages of temporary and permanent impact on jurisdictional Waters from the proposed action would be estimated based on the final or substantially complete design.

CWA Section 402 authorizes the National and State Pollutant Discharge Elimination System programs. These permit programs are intended to maintain water quality by regulating discharges of pollutants into surface waters, including sediment and pollutants that can be generated during ground-disturbing activities and transported by storm water runoff. Because construction of the proposed action would disturb more than 1 acre of land, Arizona Pollutant Discharge Elimination System (AZPDES) construction general permit would be required from the Arizona Department of Environmental Quality (ADEQ). In accordance with the AZPDES requirements, a SCIDD-approved Storm Water Pollution Prevention Plan (SWPPP) would need

to be developed and implemented for the project. The SWPPP would specify control measures to reduce soil erosion while containing and minimizing the release of construction pollutants.

Under the proposed action, construction activities that physically disrupt the ground surface could increase the vulnerability of soil to erode with surface water runoff. The use of unpaved roads during operations and during construction would loosen fine sediment, which would be picked up by storm water runoff and carried in sheet flow, rills, and ephemeral washes to the Gila River channel. Fine sediment would increase the turbidity of these storm water flows. The severity of erosion and sedimentation from the use of unpaved roads depends not only on the amount of traffic but also on storm intensity and associated runoff volumes, road gradient, and particle size. Runoff and sedimentation from the project would constitute a minor, short-term impact on water quality in the watershed.

The formation and use of a cofferdam/sheet pile during construction would have a minor temporary impact on water quality in the Gila River. Because the settling basin would remove sediment from water in the FCG Canal, it would have a long-term beneficial impact on water quality in the canal system.

Mitigation

- Structural barriers or best management practices would be used to prevent the removed sediment from discharging into the Gila River.
- The contractor would implement practices and controls for reducing the discharge of sediment in accordance with a SCIDD-approved SWPPP.

3.9 FLOODPLAINS AND FLOODING

3.9.1 Affected Environment

EO 11988, Floodplain Management, requires Federal agencies to avoid, where practicable alternatives exist, the short- and long-term adverse impacts associated with floodplain management. In carrying out its responsibilities, Federal agencies are required to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains.

The Federal Emergency Management Agency (FEMA) provides floodplain and hazard boundary maps, as part of the Flood Insurance Rate Map program, that identify flood hazard areas, base flood elevations, and flood insurance risk zones. Most of the study area is within the 100-year floodplain of the Gila River (Figure 7).

During large flood events, the regulation gates in the headworks structure at the Ashurst-Hayden Diversion Dam are closed off to cease water diversions and allow sediment-laden floodwater to flow downstream of the diversion dam in the Gila River channel. A USGS gauge is located at Kelvin, downstream of Coolidge Dam and upstream of the study area. Records for this gauge indicate that annual peak discharges occur most often during the period of August through January. In more recent years, notable large floods occurred in 1983 and 1993 (Huckleberry 1994).

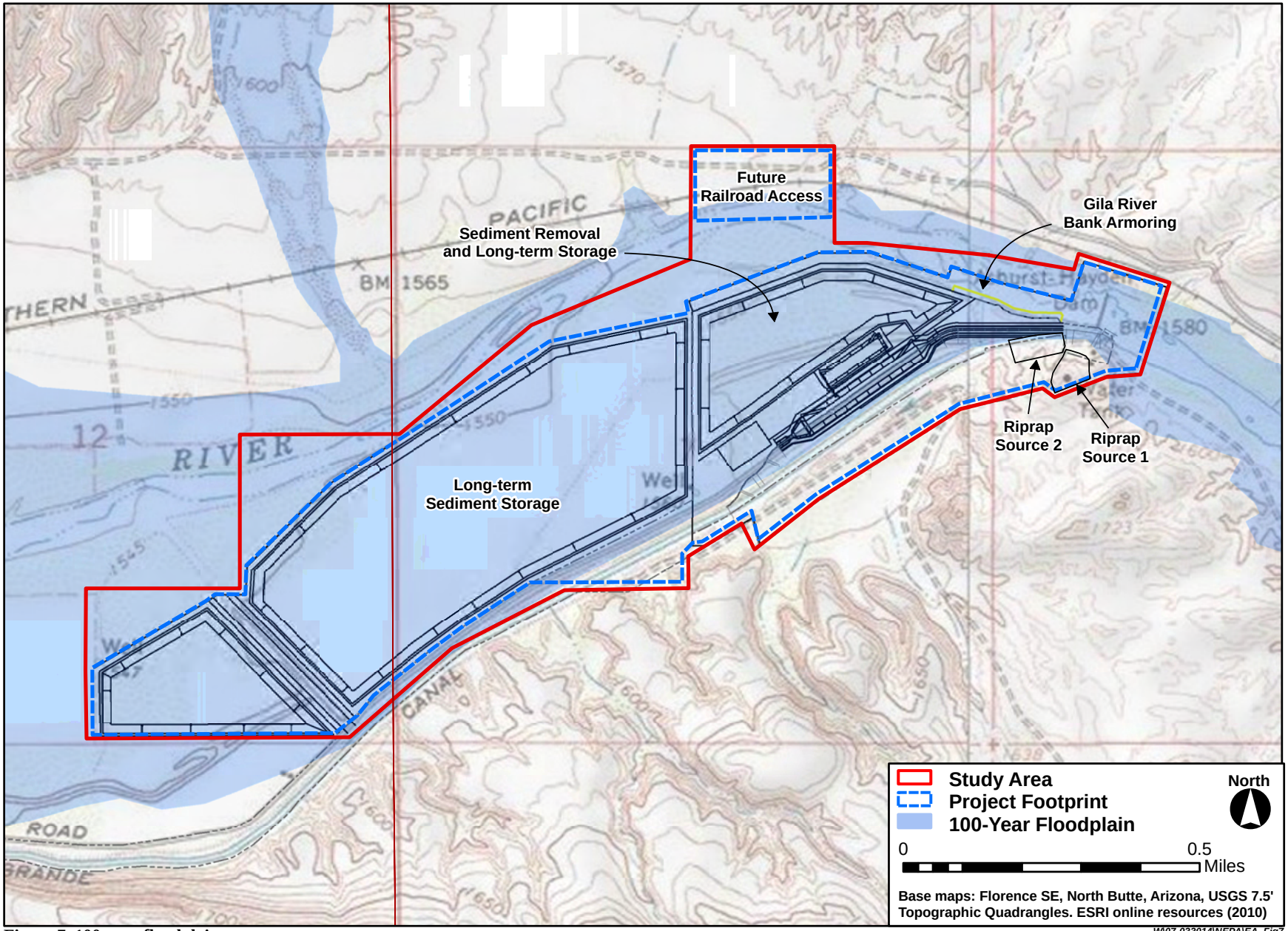

Figure 7. 100-year floodplain.

Downstream of Coolidge Dam, at a point roughly 15 miles upstream of the study area, the Gila River forms a wide floodplain (FEMA 2007). Modern channel deposits consist of cobbles, pebbles, gravels, and coarse sands. Overbank sediments are characterized by sand, silt, and clay-sized materials (Huckleberry 1994).

3.9.2 Environmental Consequences

Hydraulic analyses were completed in support of the project design. One of the purposes of the hydraulic analyses was to predict the 100-year peak discharges, and the water surface elevations at these discharges, for use in project design, environmental analysis, and permitting. A description of the methodology used for the hydraulic analyses is provided in Appendix D. As a result of modeling efforts, the predicted inundation limits of the 100-year floodplain have been mapped for the existing conditions, the proposed action, and the no action alternative (Appendix D, Figures 10, 11, and 12, respectively). Water surface elevation profiles are also provided in Appendix D.

No Action

Under the no action alternative, operation of Coolidge Dam and diversions of surface water through the headworks would be expected to continue for the foreseeable future. The south bank of the Gila River would not be armored and, therefore, would continue to be subjected to bank cutting during flood events. Without armoring, the potential for flood damage to the FCG Canal would be expected to worsen. Removal of sediment and storage within the 100-year floodplain on Federal land within the project limits would reduce floodplain capacity and would be expected to raise the 100-year floodplain by 0.6 feet in elevation above that expected under existing conditions, based on the hydraulic analyses undertaken for the project. The map depicting the no action alternative 100-year inundation limits highlights those areas of inundation that would not have been inundated under existing conditions (Appendix D, Figure 12). This impact would be localized within the project reach of the Gila River, as shown on the Water Surface Elevation Profiles graph in Appendix D.

Proposed Action

With the proposed action, a building and other proposed facilities, including a settling basin, would be built, and sediment piles up to 30 feet high would be stored within the 100-year floodplain in relatively close proximity to the Gila River channel. Construction and stockpiling within the 100-year floodplain would be expected to increase the flood elevation, and potentially erode sediment piles if, and when, floodwaters breach the established banks of the river channel. Based on the hydraulic analyses undertaken, the proposed action would be expected to reduce floodplain capacity and raise the 100-year floodplain by 1.3 feet in elevation above that expected under existing conditions based on flood modeling prepared for the project. The map depicting the proposed action 100-year inundation limits highlights those areas of inundation that would not have been inundated under existing conditions (Appendix D, Figure 11). As with the no action alternative, this impact would be localized within the project reach of the Gila River.

A Floodplain Use Permit from the Pinal County Flood Control District may be required for the project prior to the construction of any buildings or facilities or the storage of sediment within the 100-year floodplain. If a Floodplain Use Permit is required, no construction of new facilities

or stockpiling would occur within the 100-year floodplain until the permit has been issued. The project design would be adjusted, if necessary, in accordance with the Floodplain Use Permit.

No stockpiling would be allowed in the floodway. FEMA defines the "regulatory floodway" as "the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA 2010). Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood Elevations, but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available."

Improvements to the Ashurst-Hayden Diversion Dam and the headworks would increase the capability of controlling floodwaters to protect the headwords and the FCG Canal from flood damage. Scheduling of the rehabilitation of the Ashurst-Hayden Diversion Dam and headworks for the annual dry-up period (November–December), when Gila River flows are held upstream behind Coolidge Dam, would minimize the potential for construction-related impacts on the floodplain or on flooding. Minor flows would be expected to continue in the river during the dry-up; therefore, a temporary earthen cofferdam/sheet pile would be constructed upstream of the diversion dam during the proposed rehabilitation to maintain a dry construction site while directing flows downstream around the construction site. In the event of a major flood during diversion dam and headworks rehabilitation efforts, material from this earthen dam could be entrained with flood flows and washed downstream. Any indication of pending storms would signal the suspension of construction activities in the river channel and the removal of any construction equipment/materials from harm's way. The earthen dam would be formed from existing river channel material at the site; therefore, any material released downstream in floodwaters would be consistent with material entrained in flood flows through the project area under normal conditions.

Some effects of the proposed action related to floodplains and flooding would be beneficial; however, construction of facilities and storage of coarse sediment in the 100-year floodplain adjacent to the Gila River would contribute to past, present, and future development and alteration of the 100-year floodplain in the study area and upstream.

Mitigation

No mitigation is proposed.

3.10 BIOLOGICAL RESOURCES

The following section evaluates potential impacts to vegetation, wildlife, federally listed threatened, endangered, proposed, and candidate species for Pinal County, state-listed species of concern, and invasive species.

3.10.1 Affected Environment

The study area lies between 1,550 and 1,600 feet in elevation above mean sea level on relatively flat, gently southerly sloping terrain in the Gila River Valley. The Gila River is in, and adjacent

to, the study area. Except during the annual dry-up, water generally flows into the study area through the Gila River channel as a result of upstream releases from Coolidge Dam and is diverted to the FCG Canal. Because all of the water that reaches the dam is diverted, the riverbed downstream of the diversion dam is usually dry. Flood events are the exception (see Section 3.8, Water Resources and Water Quality and Section 3.9, Floodplains and Flooding). Several ephemeral drainages flow from north to south into the Gila River. The project vicinity is mostly undeveloped but supports agricultural use. Overall, the study area is a mixture of natural terrain and agricultural fields, most of which are fallow.

Vegetation

Approximately 40 percent of the area under consideration for sediment removal and long-term storage is fallow farm fields. The native vegetation community of the upland terrain of the project vicinity (except for the agricultural fields) is foothill paloverde *(Parkinsonia microphylla)*–creosote bush *(Larrea tridentata)*–dominated Arizona upland subdivision of Sonoran desertscrub (Turner and Brown 1994). Other common trees, shrubs, and cacti include blue paloverde *(Parkinsonia florida),* velvet mesquite *(Prosopis velutina),* desert ironwood *(Olneya tesota),* wolfberry (*Lycium* sp.), triangle-leaf bursage *(Ambrosia deltoidea),* saguaro *(Carnegiea gigantea),* chain-fruit cholla *(Cylindropuntia fulgida),* and Leconte's barrel cactus *(Ferocactus cylindraceus* var. *lecontei).* This community becomes increasingly creosote bush–velvet mesquite–dominated as the rolling terrain north and south of the Gila River gives way to the gently sloping upper floodplain of the river valley.

Formerly, the floodplain of the Gila River supported galleries of Fremont cottonwood *(Populus fremontii)*–Goodding willow *(Salix gooddingii).* With the introduction of saltcedar *(Tamarix ramosissima),* the native riparian community was largely replaced by this aggressive invasive tree. The usually dry river channel downstream of the dam is composed of a braided floodplain dominated by clumps of saltcedar and singlewhorl burrobrush *(Hymenoclea monogyra).* Plants found at the margins of the floodplain include native desert trees, such as mesquite, blue paloverde, occasional foothill paloverde, and creosote bush, and cacti such as chain-fruit cholla and tulip pricklypear *(Opuntia phaeacantha).*

In general, saltcedar populations have a tendency to proliferate on flood-regulated rivers compared with free-flowing, frequently flooded rivers (U.S. Fish and Wildlife Service [USFWS] 2002). A primary reason for the spread of saltcedar on regulated rivers such as the Gila is its ability to tolerate water stress compared with native species (i.e., cottonwood and willow). Alteration of the natural flood regime in the Gila River with the operation of Coolidge Dam and water diversions to the FCG Canal have resulted in the dominance of saltcedar in the study area.

Four habitat types with different vegetation communities were identified in the study area; they are listed below, along with the approximate acreages of each type within the project footprint:

1. Native Sonoran Desert habitat in the hills southwest of the Ashurst-Hayden Diversion Dam and headworks (estimated at 74 acres). Common vegetation includes paloverde, creosote bush, ironwood, saguaro, and cholla.

2. Fallow fields and other disturbed terrain on the floodplain south of the Gila River (estimated at 119 acres). The area is characterized by grasses and forbs, including abundant invasive species.

3. The lower floodplain of the Gila River, including the low-flow channel. Common vegetation includes saltcedar, mesquite, blue paloverde, and burrobrush (estimated at 137 acres). This habitat type includes approximately 17 acres of riparian vegetation dominated by saltcedar (see Section 3.11, Riparian Zones and Wetlands).

4. Highly disturbed areas along the south bank of the Gila River just downstream of the headworks where sediment from previous removal efforts has been deposited. Vegetation is sparse and mostly restricted to invasive species (estimated at 50 acres).

The native Sonoran Desert is largely undisturbed; the other three habitat types are a result of varying degrees of natural and human-caused disturbance.

Wildlife

Due to previous disturbance, most of the study area consists of low-quality wildlife habitat. This low-quality wildlife habitat is concentrated north of the FCG Canal and includes agricultural fields, stands of non-native saltcedar, and highly disturbed areas effectively devoid of vegetation. An exception is the area south of the FCG Canal, which supports moderate to high-quality Sonoran Desert habitat.

Small reptiles, including lizards and snakes, and mammals such as rabbits, rodents, javelina, and coyotes, are expected to inhabit this undisturbed Sonoran Desert habitat. Breeding birds include red-tailed hawk *(Buteo jamaicensis),* Gambel's quail *(Lophortyx gambelii),* mourning dove *(Zenaidura macroura),* Gila woodpecker *(Melanerpes uropygialis)* curve-billed thrasher *(Toxostoma curvirostra),* phainopepla *(Phainopepla nitens),* verdin *(Auriparus flaviceps),* and roadrunner *(Geococcux californianus)* (Turner and Brown 1994). Many of these species probably also utilize the disturbed agricultural field and floodplain habitats. Other wildlife that likely occur in the disturbed habitats include burrowing owl *(Athene cunicularia hypugaea),* various small mammals, snakes, and bats. The sediment piles are poor-quality wildlife habitat but may be used for foraging by lizards and small mammals.

Threatened and Endangered Species

The USFWS list of endangered, threatened, proposed, and candidate species for Pinal County (USFWS 2010) was reviewed by a qualified biologist to determine which listed species may occur in the project vicinity. The potential presence of these species is presented in Table 2.

Table 2. Potential presence of USFWS species listed in Pinal County and other special status species.

Name	Status	Habitat Requirements	Potential for Occurrence
Acuña cactus *Echinomastus erectocentrus* var. *acunensis*	C	Well-drained knolls and gravel ridges in Sonoran desertscrub. Elevation: 1,300 to 2,000 feet.	The study area occurs near the edge of the known range for the Acuña cactus, and suitable habitat occurs in the project vicinity. Potential for occurrence is good only where suitable habitat exists.

Table 2. Potential presence of USFWS species listed in Pinal County and other special status species.

Name	Status	Habitat Requirements	Potential for Occurrence
Arizona hedgehog cactus *Echinocereus triglochidiatus* var. *arizonicus*	E	Ecotone between interior chaparral and Madrean evergreen woodland. Elevation: 3,200 to 5,200 feet.	The study area is below the elevation range of the Arizona hedgehog cactus and is outside the current known range. The nearest known occurrences are approximately 21 miles northeast of the study area. No potential for occurrence.
Bald eagle *Haliaeetus leucocephalus*	T	Large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey. Elevation: varies.	No suitable nesting habitat in the study area. The Gila River in the study area represents suitable foraging habitat with a sufficient prey base when flows are present. The nearest known nesting bald eagles occur approximately 33 miles east, near the town of Winkelman along the Gila River. Low potential of occurrence and only when water with a suitable prey base is present in the Gila River.
Cactus ferruginous pygmy-owl *Glaucidium brasilianum cactorum*	DL	Sonoran desertscrub vegetation or riparian drainages and woodlands within semi-desert grassland vegetation communities Elevation: 1,300 to 4,000 feet.	The study area lies within the historical range of the cactus ferruginous pygmy-owl and approximately 20 miles north of the currently accepted range. The project area contains suitable habitat, and the nearest recorded occurrences are approximately 28 miles south of the study area. Very low potential for occurrence due to the distance to currently accepted range and recorded occurrences.
Desert pupfish *Cyprinodon macularius*	E	Shallow springs, small streams, and marshes. Tolerates saline and warm water. Elevation: <4,000 feet.	The study area is outside the current range of the desert pupfish, though when flows are present in the Gila River in the study area, there likely is a hydrologic connection to extant populations. The nearest naturally occurring or introduced populations are approximately 100 river miles upstream of the study area in a tributary of the Gila River near Pima, Arizona. Very low potential for occurrence in the study area and only while flows are present.
Gila chub *Gila intermedia*	E	Pools, springs, cienegas, and streams. Elevation: 2,000 to 5,500 feet.	The study area is outside the current range of the Gila chub, though when flows are present in the study area, there likely is a hydrologic connection to extant populations. The nearest known populations are in the Redfield Canyon and Hot Springs Canyon tributaries of the San Pedro River, approximately 65 river miles upstream of the study area south of San Manuel, Arizona. Very low potential for occurrence in the study area and only while flows are present.

Table 2. Potential presence of USFWS species listed in Pinal County and other special status species.

Name	Status	Habitat Requirements	Potential for Occurrence
Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae*	E	Desertscrub habitat with agave and columnar cacti present as food plants. Elevation: 1,600 to 11,500 feet.	Upland vegetation in the project area is Sonoran desertscrub, and food plants such as saguaro are present. The project lies approximately 45 miles from the closest major occupied roost site, and the study area is within the foraging range of bats occupying the closest roost. The presence of saguaros in the project vicinity suggests that lesser long-nosed bats may forage in the area during summer months. Moderate potential for occurrence in the project area while foraging.
Loach minnow *Tiaroga cobitis*	T	Benthic species of small to large perennial streams with swift shallow water over cobble and gravel. Recurrent flooding and natural hydrograph important. Elevation: <8,000 feet.	The study area is outside the current range of the loach minnow, though when flows are present in the study area, there likely is a hydrologic connection to extant populations. The nearest known population is in the Aravaipa Creek, a tributary of the San Pedro River, approximately 44 river miles upstream of the study area south of Dudleyville, Arizona. Very low potential for occurrence in the study area and only while flows are present.
Mexican spotted owl *Strix occidentalis lucida*	T	Nests in canyons and dense forests with multilayered foliage structure. Elevation: 4,100 to 9,000 feet.	No suitable habitat occurs in the study area. No mixed conifer or pine forest with multilayered foliage structure is present in the project vicinity. The study area is below the elevation range of the species. No potential for occurrence.
Nichol Turk's head cactus *Echinocactus horizonthaloniu s* var. *nicholii*	E	Sonoran desertscrub. Elevation: 2,400 to 4,100 feet.	The study area is outside the known distribution of the species and below the elevation range of the species. The nearest known populations lie at least 55 miles southwest, in the foothills of the Waterman Mountains. No potential for occurrence.
Northern Mexican gartersnake *Thamnophis eques megalops*	C	Cienegas, stock tanks, large-river riparian woodlands and forests, streamside gallery forests. Elevation 130 to 8,500 feet.	No suitable habitat is found in the project area. No perennial water, cienegas, stock tanks, large-river riparian woodlands and forests, or streamside gallery forests are in the study area. The nearest known occurrences are approximately 17 miles northeast, within the Queen Creek drainage. No potential for occurrence.

Table 2. Potential presence of USFWS species listed in Pinal County and other special status species.

Name	Status	Habitat Requirements	Potential for Occurrence
Razorback sucker *Xyrauchen texanus*	E	Riverine and lacustrine areas; generally not in fast-moving water; may use backwaters. Elevation: <6,000 feet.	The Gila River historically supported razorback suckers and was stocked as recently as the late 1980s by the Arizona Game and Fish Department upstream of San Carlos Reservoir, approximately 60 river miles upstream of the study area, though no individual razorbacks have been detected since the reintroductions. No other populations exist upstream of the study area. If populations do persist, when flows are present in the Gila River within the study area, there likely is a hydrologic connection. Very low potential for occurrence in the study area and only while flows are present.
Roundtail chub *Gila robusta*	C	Cool to warm waters of rivers and streams; often occupy the deepest pools and eddies of large streams. Elevation: 1,000 to 7,500 feet.	The project is outside the current range of the roundtail chub, though when flows are present in the Gila River within the study area, there likely is a hydrologic connection to existing populations. The nearest known populations are in the Aravaipa River, a tributary of the San Pedro River, approximately 44 river miles upstream of the study area south of Dudleyville, Arizona. Very low potential for occurrence in the study area and only while flows are present.
Sonoran Desert tortoise *Gopherus agassizii*	S	Rocky slopes and bajadas of Mojave and Sonoran desertscrub. Caliche caves in incised, cut banks of washes are often used for shelter sites. Elevation: 500 to 5,300 feet.	The study area occurs within the known range, and suitable habitat for the Sonoran Desert tortoise occurs within the study area. Several known occurrences are located within approximately 5 miles of the study area. Potential for occurrence where suitable habitat exists.
Southwestern willow flycatcher *Empidonax traillii extimus*	E	Cottonwood/willow and saltcedar vegetation communities along rivers and streams. Elevation: <8,500 feet.	Though portions of the study area occur within designated critical habitat for the Southwestern willow flycatcher, no suitable breeding habitat is present. There are no dense thickets of riparian vegetation along perennial streams in the project vicinity. The nearest known occurrences are approximately 10 miles upstream along the Gila River. The Gila River is a potential migration corridor, and the habitat along the Gila River within the study area may represent suitable migration stop-over habitat. Very low potential for occurrence, and most likely only during migration, due to the unsuitability of the habitat for breeding in the study area.

Table 2. Potential presence of USFWS species listed in Pinal County and other special status species.

Name	Status	Habitat Requirements	Potential for Occurrence
Spikedace *Meda fulgida*	T	Medium to large perennial streams with moderate to swift velocity waters over cobble and gravel substrate. Recurrent flooding and natural hydrograph important to withstand invading exotic species. Elevation: <6,000 feet.	The study area is outside the current range of the spikedace, though portions of the study area lie within designated critical habitat. When flows are present in the study area, there likely is a hydrologic connection to existing populations. The nearest known populations are in Aravaipa Creek, a tributary of the San Pedro River, approximately 44 river miles upstream of the study area south of Dudleyville, Arizona. Very low potential for occurrence in the study area and only while flows are present.
Tucson shovel-nosed snake	C	Sonoran desertscrub; associated with soft, sandy soils with sparse gravel. Elevation: 785 to 1,662 feet.	Marginally suitable habitat is found in the project area. The nearest known occurrences are approximately 6 miles west, along State Route 79. Potential for occurrence only where suitable habitat exists.
Western burrowing owl *Athene cunicularia hypugaea*	S	Open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. Sometimes in open areas such as vacant lots near human habitation. Elevation: 650 to 6,200 feet.	The study area contains suitable habitat for the burrowing owl, including fallow agricultural land with adequate available burrows. The nearest recorded occurrences are approximately 17 miles te southeast of the study area. Potential for occurrence where suitable habitat exists.
Yellow-billed cuckoo *Coccyzus americanus*	C	Large blocks of riparian woodlands. Cottonwood, willow, or tamarisk galleries. Elevation: <6,500 feet.	No suitable habitat is found in the project area. No dense thickets of riparian vegetation are along perennial streams in the project vicinity. The nearest known occurrences are approximately 8 miles upstream, along the Gila River. No potential for occurrence.
Yuma clapper rail *Rallus longirostris yumanensis*	E	Fresh water and brackish marshes. Elevation: <4,500 feet.	No suitable habitat is found in the project area. No perennial water is in the study area. No large stands of cattails or other march plants are in the project vicinity. The nearest known Yuma clapper rail occurrences are approximately 16 miles southwest of the study area, in Picacho Reservoir. No potential for occurrence.

C=Candidate, DL=Currently delisted, E=Endangered, T=Threatened (USFWS 2010); S=Sensitive species

State Sensitive Species

As part of the NEPA scoping process, a letter describing the project was sent to the Arizona Game and Fish Department (AGFD) to inform the agency of the project and to solicit comments. The letter requested any specific concerns, suggestions, or recommendations the agency may have related to the project. The AGFD did not respond to the scoping notice; however, the AGFD on-line tool was used to access a list of sensitive species that may occur in the project area (Appendix E).

The State of Arizona maintains a list of Wildlife of Special Concern, and two of these species were identified by the AGFD as occurring in the project vicinity: Western burrowing owl *(Athene cunicularia hypugaea)* and Sonoran Desert tortoise *(Gopherus agassizii)*. Though the Western burrowing owl is not protected by the Endangered Species Act, it is protected from take under the Migratory Bird Treaty Act (MBTA) of 1918 and should be considered during project planning, design, and construction to avoid such take.

The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell migratory birds. All migratory birds, not just burrowing owls, are protected. Thus, migratory birds nesting in areas where land clearing would occur under the proposed action would be protected under the MBTA.

Invasive Species

Based on EO 13112 on invasive species, dated February 3, 1999, all projects will, "subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: i) prevent the introduction of invasive species; ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; iii) monitor invasive species populations accurately and reliably…[and] iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

An invasive species survey of the study area was conducted. The survey results are presented for the four previously identified habitat types in the study area. Table 3 lists invasive species observed and their relative abundance in each area. Because of the season of the plant survey (mid-March), it was not possible to create a complete list of invasive species that likely occur in the project area. Annual species associated with the summer rainy season were absent or were represented by dried remains that were often unidentifiable. Some late-winter/spring annual species were not mature, leading to further difficulty in identification.

Table 3. Invasive species observed in the study area and their relative abundances.

Common and Scientific Name	Sonoran Desert	Fallow Fields/Disturbed Areas	Lower Floodplain of Gila River	Sediment Deposition Areas
Asian mustard *Brassica tournefortii*	Common	Absent to rare	Common	Common to abundant
Athel *Tamarix aphylla*	Absent	Uncommon and only bordering fields	Absent	Absent
Bermudagrass *Cynodon dactylon*	Absent	Common to dominant	Scattered but common	Common
Cheeseweed mallow *Malva parviflora*	Absent	Common to abundant	Absent	Absent
Common cocklburr *Xanthium strumarium*	Absent	Absent	Absent	Uncommon
London rocket *Sisymbrium irio*	Common to abundant	Common to dominant	Scattered but common	Common
Mediterranean grass *Schismus* sp.	Common	Common to abundant	Scattered but common	Common
Nettleleaf goosefoot *Chenopodium murale*	Absent	Common	Absent	Absent
Prickly lettuce *Lactuca serriola*	Absent	Uncommon	Absent	Absent

Table 3. Invasive species observed in the study area and their relative abundances.

Common and Scientific Name	Sonoran Desert	Fallow Fields/Disturbed Areas	Lower Floodplain of Gila River	Sediment Deposition Areas
Prickly Russian thistle *Salsola tragus*	Absent	Common (young plants and dried remains)	Absent	Absent
Redstem stork's bill *Erodium cicutarium*	Common to abundant	Common to dominant	Scattered but common	Common
Saltcedar *Tamarix ramosissima*	Absent	Common but only bordering fields	Common to dominant	Common
Spiny sowthistle *Sonchus asper*	Absent	Common	Absent	Absent
Tree tobacco *Nicotiana glauca*	Absent	Absent	Absent	Uncommon

It is apparent from the presence and absence of the various invasive species in the habitat types within the study area that the species present in the Sonoran Desert habitat (e.g., Asian mustard, redstem stork's bill, Mediterranean grass, and London rocket) are also present in the other habitat types in the study area. Bermudagrass is common in areas of disturbed habitat but does not invade Sonoran Desert habitat. Other species, including nettleleaf goosefoot, prickly lettuce, cheeseweed mallow, prickly Russian thistle, and spiny sowthistle, appear to be restricted primarily to the disturbed habitat of the fallow fields. Others, such as tree tobacco and common cocklebur, are only found in the sediment deposition areas.

Of the 14 invasive species observed, only four invasive species are represented in the Sonoran Desert habitat, the least disturbed habitat type. Of the disturbed habitat types, six species were observed in the lower floodplain habitat, eight in the sediment deposition areas, and 11 in the fallow field habitat.

3.10.2 Environmental Consequences

No Action

Under the no action alternative, no project would be constructed; therefore, the only disturbance to biological resources would be associated with the removal of coarse sediment from the canal and stockpiling of the sediment on Federal lands adjacent to the canal. The lands adjacent to the canal are heavily disturbed and of low value to native plants or wildlife; therefore, there would be only minor impacts to biological resources.

Proposed Action

Similar to the no action alternative, some potential impacts to biological resources would be associated with sediment disposal. Unlike the no action alternative, sediment disposal under the proposed action would occur in the fallow agricultural field and floodplain habitats. Most of the project area is highly disturbed and therefore provides poor-quality habitat for native plants and wildlife. The fallow fields, in particular, are devoid of native vegetation and would be considered more suitable for sediment disposal.

Though there is some good-quality Sonoran Desert habitat on the south side of the FCG Canal, this area would not be used for sediment disposal. However, as many as 4.1 acres (one 2-acre site

and another 2.1-acre site) of this upland Sonoran Desert habitat would be used to mine riprap for use in armoring the bank of the Gila River. As a result, there would be moderate impacts to native plants and wildlife under the proposed action.

With the exception of the area south of the FCG Canal, the project area is highly disturbed, and no suitable habitat for any federally listed species is present. The undisturbed Sonoran Desert habitat is potentially suitable foraging habitat for the lesser long-nosed bat. Aside from the lesser long-nosed bat, the implementation of the proposed action would not impact threatened or endangered species or their corresponding habitats. A brief discussion of selected federally listed species and other special status species that may occur in the project vicinity follows.

The Southwestern willow flycatcher (WIFL) breeds in dense riparian stands that are often made up of saltcedar, and the project area above Ashurst-Hayden Diversion Dam lies in designated critical habitat. Critical habitat for the WIFL is defined by the presence of primary constituent elements, which can be summarized as follows: Riparian habitat in a dynamic successional riverine environment that comprises dense riparian vegetation, including tree and shrub species that are known to support WIFL populations, ranging in height from 2 to 30 meters (6 to 98 feet), with areas of dense riparian foliage at least from the ground level up to approximately 4 meters (13 feet) above the ground, or dense foliage only at the shrub level, or as a low, dense tree canopy interspersed with open water or marsh, or shorter/sparser vegetation that creates a mosaic that is not uniformly dense. These areas must maintain a variety of insect prey populations normally found within or adjacent to riparian floodplains or moist environments, and areas suitable for nesting that contain a dense tree and/or shrub canopy (i.e., a tree or shrub canopy with densities ranging from 50 percent to 100 percent) (USFWS 2005).

However, the study area below Ashurst-Hayden Diversion Dam is not designated critical habitat for the WIFL. Here, the Gila River channel supports small saltcedar (5 to 8 feet tall) that are not dense and, therefore, this habitat is not potentially suitable for the WIFL. In addition, for much of the year this area lacks open water or marshy areas that are characteristic of WIFL habitats.

Though the project area is designated critical habitat for the spikedace, this small fish is unlikely to be present in the project area. Flows in the Gila River in the project area are interrupted by an annual dry-up at Ashurst-Hayden Diversion Dam; therefore, there are periods when there is no connection to Aravaipa Creek, the nearest known population of spikedace. Only one specimen of spikedace has ever been collected from the Gila River downstream of Coolidge Dam, and this reach of river is heavily populated with predatory nonnative fishes (Voeltz 2002).

The lesser long-nosed bat may utilize the saguaros from the undisturbed Sonoran Desert for foraging; however, the nearest occupied roost site for this species is 45 miles from the project area. The lesser long-nosed bat feeds on pollen, nectar, and fruits of columnar cacti, especially saguaros. As many as 50 saguaros may be removed from the two areas of Sonoran desertscrub where riprap mining would occur, which could reduce foraging opportunities for the bat in the project vicinity. Because of the vast expanse of remaining Sonoran desertscrub within the state that supports columnar cacti, this effect would be negligible. Nevertheless, Reclamation has submitted a Biological Assessment to the USFWS with a determination that the project “may affect, but is not likely to adversely affect” the endangered lesser long-nosed bat (Reclamation

2010). The USFWS concurred with this determination in a letter dated May 13, 2010 (Appendix A). Mitigation would be implemented to reduce potential impacts on this species.

Like the lesser long-nosed bat, the Acuña cactus may be found in Sonoran desertscrub. The study area occurs near the edge of the known range for the Acuña cactus, and the species may be present where suitable habitat, well-drained knolls, and gravel ridges exist. However, surveys were conducted of the two riprap mining sites, and no Acuña cactus were found; therefore, the proposed action would have no effect on the Acuña cactus.

The Sonoran Desert tortoise is known from within 3 miles of the project area. Suitable tortoise habitat in the study area is the undisturbed areas of Sonoran desertscrub, not the abandoned farm fields or the Gila River floodplain where sediment disposal is planned to occur. However, if tortoises are present in the two areas of riprap mining, project construction may impact the Sonoran Desert tortoise. Burrows may be destroyed, and individual tortoises may be displaced or inadvertently killed.

Construction of the proposed action would ultimately remove approximately 260 acres of potential plant and wildlife habitat. Much of this land has been developed for agriculture; however, even developed lands can represent suitable wildlife habitat. For example, burrowing owls are known to inhabit abandoned agricultural fields or the berms surrounding active or fallow fields (deVos 1998). Project construction may impact the burrowing owl by eliminating burrows or otherwise disturbing their habitat; therefore, mitigation measures requiring the survey and potential relocation of burrowing owls would be implemented. Other animals and plants that are not special status species may be similarly impacted by habitat loss associated with the disposal of sediment on agricultural fields.

Fourteen invasive species were found in the study area. The high number of invasive species is likely associated with the highly disturbed nature of the habitat. Under the proposed action, disposal of sediment in the Gila River floodplain and in fallow agricultural fields would create additional habitat for these invasive species, potentially causing an increase in the number of these undesirable species and the number of individual plants. Mitigation measures to prevent the introduction and spread of these species would be necessary during project construction and operation.

Project effects on biological resources would be incremental to the reasonably foreseeable past and future actions. The incremental effect of the proposed project on vegetation, wildlife, and special status species would be mostly short-term and negligible. The incremental effect of the project on invasive species would be longer-term and minor; however, these effects would be mitigated by adherence to the mitigation measures that follow.

Mitigation

- Prior to any ripping or blasting in Riprap Source 1 or Riprap Source 2, SCIDD would transplant all barrel cacti and single-stem saguaros (size class found to be most successful when transplanted) from the affected area to a nearby location and monitor their survival for a 10-year period. During this monitoring period, all dead barrel cacti and saguaros would be replaced. Transplanting activities would not occur during the period from July 1 to September 30, when bats would be more likely to forage at the site.

- Reclamation would monitor for bat activity during the foraging season in 2010.
- Blasting and/or mining of the riprap and armoring of the Gila River bank would be conducted only during daylight hours.
- Every attempt would be made to complete land-clearing activities during the September 1 through February 28 time frame to avoid the breeding season of migratory birds. If clearing activities must be undertaken anytime during the breeding period (March 1 through August 31), a qualified biologist would survey the area in advance of the action to determine the presence or absence of nesting birds.
- If Sonoran Desert tortoises are encountered during construction, the contractor would follow the "Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects." Any tortoises relocated would be moved by a biologist trained under the "Guidelines."
- To prevent the introduction of invasive species seeds, all construction equipment would be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation debris prior to leaving the construction site.
- Where appropriate, all disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.
- The contractor would employ a biologist to complete a preconstruction survey for burrowing owls 96 hours prior to construction in all suitable habitat that would be disturbed. The biologist would possess a burrowing owl survey protocol training certificate issued by the AGFD. Upon completion of the surveys, the contractor would contact the Phoenix Area Office of Reclamation to provide survey results.
- During the operations phase, the contractor would employ a biologist to complete a preconstruction survey for burrowing owls 96 hours before new areas are utilized for sediment storage. The biologist would possess a burrowing owl survey protocol training certificate issued by the AGFD.
- If any burrowing owls are located during preconstruction surveys or construction, the contractor would employ a biologist holding a permit from the USFWS to relocate burrowing owls from the project area, as appropriate. Organizations such as Wild at Heart and Liberty Wildlife also could be contacted to remove/relocate burrowing owls.
- If burrowing owls or active burrows are identified during the preconstruction surveys or during construction, no construction activities would take place within 100 feet of any active burrows until the owls are relocated.
- The geographic extent of excavation for riprap would be limited to only that area required to provide the quantities necessary for bank stabilization. Excavation of riprap would be initiated at Riprap Source 1, as depicted in the project plans. Riprap Source 2 would only be used if sufficient material could not be generated from Riprap Source 1.

3.11 RIPARIAN ZONES AND WETLANDS

3.11.1 Affected Environment

Though the riparian zone of the Gila River in the project vicinity was once made up of native Fremont cottonwood and Goodding's willow, it is now dominated by the introduced, invasive saltcedar. Other, less common riparian plants in the project area include mesquite, blue paloverde, and burrobrush. In general, the riparian vegetation is short and sparse and, because of the wide floodplain of the Gila River, the riparian zone is broad and flat. No wetlands are in the project area.

3.11.2 Environmental Consequences

No Action

Under the no action alternative, minor impacts to the riparian zone of the Gila River would continue to occur with the operations of the Ashurst-Hayden Diversion Dam, the headworks, and the FCG Canal, including the removal and storage of coarse sediment.

Proposed Action

With the proposed action, direct and permanent impacts to the riparian zone would result from the armoring of the river bank and long-term sediment storage. Approximately 7 acres of riparian vegetation dominated by saltcedar would be lost with these uses, with the greatest loss of riparian vegetation due to sediment storage. Indirect effects to the riparian zone would also result from soil erosion and sedimentation associated with operations of the proposed settling basin system and the transport and disposal of sediment. These permanent impacts would result in losses of minor amounts of riparian vegetation, mostly non-native saltcedar.

Temporary impacts to the riparian zone would result from the excavation of river channel substrate from the upstream side of the headworks structure to form the earthen dam. These temporary impacts would be negligible.

The effects of project activities on the riparian zone would be incremental to historic, ongoing, and future uses of the Gila River in the project vicinity. Historically, the loss of native riparian vegetation and its replacement with non-native vegetation has been dramatic. The proposed project would result in negligible cumulative impacts to the riparian zone of the Gila River.

Mitigation

No mitigation is proposed.

3.12 NOISE

3.12.1 Affected Environment

Ambient noise levels in the study area and vicinity are relatively low. Noise levels are higher in close proximity to the dam, where there is associated noise from the diversion of water. Intermittent noise is also generated with the operation of farm equipment and machinery, the passage of trains, and from motor vehicle travel on Diversion Dam and Price roads.

3.12.2 Environmental Consequences

No Action

Under the no action alternative, it is anticipated that existing noise sources and low noise intensity would prevail into the foreseeable future. The operation of machinery (e.g., draglines, trucks, bulldozers) to remove sediment would be expected to continue but increase in frequency.

Proposed Action

There would be no change in noise generated from the diversion of water through the headworks structure as a result of the proposed action. However, the proposed action would create new noise sources related to the operation of equipment and machinery associated with sediment removal activities, and the use of a conveyor system or trucks to transport sediment to long-term storage areas.

Due to their proximity to a proposed long-term sediment storage area, the two residences on private property adjoining the study area could ultimately experience a minor and intermittent increase in noise levels related to truck transport. However, based on project estimates, transport of sediment to these adjacent lands would not occur for roughly 30 years from project implementation.

If sediment is sold to outside parties in the future, trucks hauling sediment would result in an increase in traffic noise for the full length of Diversion Dam Road (from the town of Florence to the study area). Though the proposed action could result in an increase in truck traffic on Diversion Dam Road, truck traffic associated with the previously referenced (Section 3.2) sand operation would be eliminated. The level of increase in the volume of truck traffic with the proposed action would be a function of future sale volumes and, therefore, cannot be estimated at this time. Construction-related noise would be generated from the use of heavy equipment such as tractors, loaders, bulldozers, and trucks that would perform the dam and headworks repairs, construct the riprap bank protection, construct the sediment processing area, and construct the cofferdam/sheet pile. High-intensity, short-term noise would also be generated with blasting activities. Construction-related noise would be temporary.

The proposed project would have no cumulative impact on noise with any known current, historic, or future actions.

Mitigation

No mitigation is proposed.

3.13 AIR QUALITY

3.13.1 Affected Environment

As directed by the Federal Clean Air Act (CAA), the Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants in Title 40, CFR, Part 50. These standards were adopted by the EPA to protect the public health and welfare. The six pollutants of concern are: carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, lead, and particulate matter ($PM_{10,}$ inhalable coarse particles less than 10 but more than

2.5 microns in diameter, and $PM_{2.5,}$ fine particles less than 2.5 microns in diameter). States are required to adopt standards that are at least as stringent as the NAAQS.

The CAA requires that states classify air basins (or portions thereof) as either "attainment" or "non-attainment" with respect to criteria pollutants. If an air basin does not meet the NAAQS for one or more pollutants, then the area is classified as "non-attainment" for that pollutant. For non-attainment areas, states are required to formulate and submit State Implementation Plans to the EPA that outline those measures the state will use to attain and maintain compliance with NAAQS (40 CFR Part 51). The study area is in a section of Pinal County that is considered to be in attainment for all regulated pollutants.

The ADEQ is currently reviewing PM_{10} designations for Pinal County. Particulate matter 10 microns in size and smaller can penetrate the lungs of humans and animals and is subject to a NAAQS to protect public health and welfare. Potential regional sources of air pollutants include particulate matter from fire (both wild and prescribed) and natural events such as windstorms. Disturbed lands, including active and abandoned agricultural fields, constitute a source of PM_{10} within the study area and the region. Motor vehicle travel on paved and unpaved roads contributes to the generation of $PM_{10,}$ $PM_{2.5}$, and other criteria pollutants in the region.

Current Federal visibility regulations (CAA) were designed to protect mandatory Class I areas for visibility (e.g., National Park and Wilderness Areas) and are aimed primarily at the regulation of industrial point sources such as power plants and mining smelters. No specially designated areas are within the study area or vicinity. The nearest Class I airshed is associated with the Bureau of Land Management (BLM)–administered White Canyon Wilderness Area approximately 7 miles to the northeast.

EO 13514 directs Federal agencies to promote pollution prevention and reduce emissions of greenhouse gases (GHGs) from actions under their control. In accordance with EO 13514, the CEQ defines GHGs as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The CEQ has proposed an annual reference threshold of 25,000 metric tons of direct carbon dioxide (CO_2)-equivalent GHG emissions as a useful indicator for agencies to consider when analyzing potential action-specific GHG emissions in NEPA documents (CEQ 2010). This threshold was considered relevant by the CEQ because it is a minimum standard for reporting GHG emissions from specified industries under the CAA (EPA's Mandatory Reporting of Greenhouse Gasses Final Rule, 74 FR 56260). Regional sources of CO_2-equivalent GHGs include combustion emissions from heavy equipment and light vehicles.

3.13.2 Environmental Consequences

No Action

Under the no action alternative, there would be no direct impact to air quality because no project construction would occur. Existing sources and activities of air pollutant emissions—fugitive dust from existing and future sediment stockpiles, use of unpaved roads, and agricultural production—would persist into the foreseeable future.

Proposed Action

The two residences on private land that adjoin a portion of the study area planned for long-term sediment storage are the only sensitive receptors in the immediate vicinity. Temporary or permanent increases in air pollutant emissions associated with the proposed action could result in a negative effect on the residents due to their proximity.

Operations associated with the proposed action would result in the ongoing generation of fugitive dust in the study area. The use of unpaved roads (for site access as well as for site operations), sediment removal, sediment transport to long-term storage areas, and excavation (ripping and, if required, blasting) would result in a minor but ongoing increase in PM_{10}. Though the study area is in a section of Pinal County that is considered to be in attainment for all regulated pollutants, proposed activities must comply with Pinal County Air Quality Control District (PCAQCD) regulations. Because the area of disturbance would be greater than 0.1 acre, a permit from the PCAQCD would be required.

Under high wind conditions, sediment stored on-site could become a source of fugitive dust. However, due to the coarse nature of the sediment being removed and stored, the presence of fine particles in these sediment piles would be limited, and any dust generated from these piles would be expected to be minor, intermittent, and localized.

The operation of motor vehicles, including trucks, and other heavy equipment during project operations would generate minor amounts of engine combustion products such as nitrogen and nitrous oxides, CO_2, carbon monoxide, and reactive organic gases. A minor amount of electricity would also be consumed in the construction and operation of the proposed action. The burning of fossil fuels in the generation of electricity would result in a minor and indirect effect from the proposed action. The emissions generated on-site and off-site would not produce measurable changes in ambient concentrations of regulated pollutants or result in a change in attainment status for the air quality region. In consideration of GHGs, the annual emission of CO_2-equivalent GHGs from the proposed action would be substantially below the threshold proposed by the CEQ to be relevant to the decision-making process.

Construction activities, including the operation of earthmoving equipment, would generate fugitive dust, a minor transient effect on ambient air quality in the study area. The temporary operation of construction equipment and motor vehicles would generate minor amounts of engine combustion products described previously. Construction in the vicinity of the sensitive receptors would be related to the blading of a 50-foot-wide unpaved roadway for site circulation.

Particulate and gaseous exhaust emissions (including GHGs) from the proposed action would be cumulative to pollutants emitted into the atmosphere from other natural and human sources. A proposed quarry for landscaping gravel and rock is a known future use that would contribute to the generation of air pollutants in the area. This operation would be located approximately 1.3 miles north of Ashurst-Hayden Diversion Dam. The generation of fugitive dust with the operation of motor vehicles on dirt roads as a result of the proposed action would be cumulative with that of truck traffic anticipated with this proposed sand and gravel operation.

Mitigation

- The contractor would minimize land disturbance during site preparation and construction.
- To suppress dust on unpaved roads during construction, the contractor would use watering trucks, chemical dust suppressants, or other reasonable precautions.
- Trucks hauling soil or sediment would be covered.
- With the exception of long-term storage of sediment, unused materials would be removed from the project area following construction.
- All disturbed lands that would not be permanently incorporated into project operations, except sediment piles, would be revegetated or otherwise stabilized.

3.14 HAZARDOUS MATERIALS

3.14.1 Affected Environment

A hazardous materials site assessment would be conducted prior to the acquisition of lands for the proposed Phase I Rehabilitation project, in accordance with 602 Departmental Manual 2 (Real Property Pre-Acquisition Environmental Site Assessments) and BIA guidelines. A review of a regulatory database (Allands 2010) was performed to identify the presence of hazardous materials or similar environmental concerns that may be adversely affected by the proposed action. The regulatory database search report found no areas of hazardous materials or other environmental concerns in the study area.

Approximately 40 percent of the study area and a portion of the project vicinity is located on areas of recently active or former agricultural farmland. It is possible that past agricultural practices may pose a minor environmental concern due to the potential presence of residual pesticides and herbicides in the soils. Concentrations of pesticides and/or herbicides may be present in the soil surfaces or the shallow subsurface. These former agricultural area soils could pose an environmental concern if (1) the extent of their surface area disturbances is significant and (2) the potential presence of residual pesticides and herbicides in the soils exceeds regulatory thresholds for worker health and safety or soil waste management issues.

Other factors have a slight possibility for hazardous material concern. There could be undocumented railroad-related hazardous material spills or releases associated with the Copper Basin Railway, which crosses through the study area. The USGS topographic map identified mining or mineral-related prospect pits, excavations, or mine shafts about 1 mile east and northeast of the study area. One prospect is located along the Gila River, about 1 mile upstream of the project area; however, the possibility of any downstream mining-related contamination is unlikely. No other existing hazardous materials or related environmental concerns were noted.

3.14.2 Environmental Consequences

No Action

Under the no action alternative, the project would not be constructed, and there would be no impact on hazardous materials.

Proposed Action

Residual concentrations of pesticides, herbicides, or both may be present in soils in the agricultural lands of the project area. Soil disturbance would occur under the proposed action in areas of active and fallow agricultural land. These residual concentrations of pesticides and herbicides could pose an environmental concern if levels exceed regulatory thresholds for worker health and safety. With the proposed action, excavation would be focused primarily on the site of the settling basin system and the area proposed for the generation of riprap. Neither of these areas was previously used for agriculture. Agricultural land in the study area would be used primarily for long-term sediment storage—areas requiring less construction activity.

The use, storage, and disposal of hazardous materials and solid waste associated with construction have the potential to contaminate soil, water, and vegetation, and could indirectly affect wildlife and humans. Project construction would require the short-term use of fuels, lubricants, and other fluids that would be necessary to operate construction equipment.

If the project stores an aggregate of more than 1,320 gallons of oil or other petroleum products on-site, it would be subject to the Spill Prevention, Control, and Countermeasure (SPCC) Regulation (40 CFR 112), and a SPCC Plan would be required. With the implementation of appropriate hazardous material management and solid waste disposal, impacts on the environment related to these materials would be avoided. Therefore, no permanent, temporary, or cumulative impacts are anticipated.

Mitigation

- The contractor would ensure that appropriate Occupational Safety and Health Administration recommendations are followed for levels of personal protective equipment (i.e., dust masks and protective eyewear to minimize contact with airborne dust) to be used by all persons entering or working in the project area.
- Lined secondary containment would be required for any fuels stored in the project area.
- If storage occurs on-site, fuel and lubricants would be placed in clearly marked above-ground containers that would be provided with secondary containment.
- Any hazardous wastes would be properly containerized, labeled, and transported to a permitted disposal facility in accordance with Federal and state regulations.

4.0 CONSULTATION AND COORDINATION

4.1 LIST OF AGENCIES AND PERSONS CONTACTED

Reclamation submitted information on the project proposal to the following entities during the development of this Draft EA. The names of the individuals are retained in the administrative record.

4.1.1 Indian Communities

- Ak-Chin Indian Community
- Gila River Indian Community
- Hopi Tribe
- Pascua Yaqui Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Zuni Tribe

4.1.2 Congressional Delegation

- Senator John McCain
- Senator Jon Kyl

4.1.3 Local Government Agencies

- Pinal County Board of Supervisors
- Pinal County Air Quality Control District
- City of Casa Grande
- City of Coolidge
- Town of Florence
- Florence Flood Control District
- Mayor Vicki Kilvinger, Town of Florence

4.1.4 State Agencies

- ADEQ
- AGFD
- Arizona Department of Water Resources
- Arizona State Land Department

- Governor Jan Brewer
- SHPO

4.1.5 Federal Agencies

- BIA/SCIP
- BLM
- Corps
- EPA
- NRCS
- USFWS
- USGS

4.1.6 Conservation, Environmental, and Recreation Organizations

- Center for Biological Diversity
- Sierra Club

4.1.7 Grazing Organization

- Arizona Cattle Growers Association

4.1.8 Other Organizations

- ASARCO
- Gila River Farms
- Hohokam Irrigation and Drainage District
- SCIDD

5.0 LIST OF PREPARERS

This Draft EA has been prepared by Reclamation with the assistance of EcoPlan Associates, Inc.

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6.0 RELATED ENVIRONMENTAL LAWS/DIRECTIVES

The CEQ regulations encourage agencies to "integrate the requirements of NEPA with other planning and environmental review procedures required by law." Coordinating NEPA procedures with those of other Federal environmental statutes and EOs facilitates NEPA objectives by promoting efficiencies in environmental planning and development of relevant information on which to base agency decisions. This integrative approach to NEPA ensures planning, review, and compliance processes run concurrently rather than consecutively with procedures required by other environmental laws.

The following is a list of Federal laws, EOs, and other directives that apply to the action alternatives discussed in this Draft EA:

The National Environmental Policy Act of 1969, as amended, requires Federal agencies to evaluate the potential environmental consequences of major Federal actions. An action becomes "federalized" when it is implemented, wholly or partially funded, or requires authorization by a Federal agency. The intent of NEPA is to promote consideration of environmental impacts in the planning and decision-making process prior to project implementation. NEPA also encourages full public disclosure of the proposed action, accompanying alternatives, potential environmental effects, and mitigation.

Scoping information was posted on Reclamation's Phoenix Area Office website and distributed to more than 79 individuals, organizations, and agencies on February 17, 2010. News releases regarding the proposal were submitted to 11 news media outlets. Public comments were considered during preparation of the Draft EA and helped guide the development of the proposed project and mitigation. This Draft EA was mailed to potentially affected or interested individuals, organizations, and agencies for public comment. The Draft EA is available on Reclamation's Phoenix Area Office website.

The Fish and Wildlife Coordination Act (FWCA) of 1958, as amended, provides a procedural framework for the consideration of fish and wildlife conservation measures in Federal water resource development projects. Scoping information and the Draft EA were provided to the USFWS for comment on mitigating losses to wildlife that may result from the project. This review process satisfies the coordination requirements of the FWCA.

Reclamation sent scoping notices to the USFWS and the AGFD to invite each agency to coordinate and comment on the proposed project. The USFWS and the AGFD did not send responses or provide comments during scoping.

The Endangered Species Act of 1973, as amended, provides protection for plants and animals that are currently in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). Section 7 of this law requires Federal agencies to ensure that their activities do not jeopardize the continued existence of threatened or endangered species or adversely modify designated critical habitat. Reclamation concluded that the proposed project "may affect, but is not likely to adversely affect: lesser long-nosed bat. No other federally listed species would be affected."

The USFWS list of endangered, threatened, proposed, and candidate species for Pinal County was reviewed by a qualified biologist to determine which listed species may occur in the project vicinity. Table 2 examines the potential for endangered, threatened, proposed and candidate species for Pinal County. Due to potential effects on the lesser long-nosed bat, Reclamation prepared a Biological Assessment and submitted it to the USFWS for its review under Section 7(a)(2).

The Migratory Bird Treaty Act of 1918, as amended, implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. The Migratory Bird Treaty Act prohibits the take, possession, import, export, transport, selling, or purchase of any migratory bird, their eggs, parts, or nests.

The Western burrowing owl, protected from take under the Migratory Bird Treaty Act, was identified as potentially occurring in the project vicinity. Mitigation measures have been included to avoid such take.

The Clean Air Act of 1963, as amended, requires any Federal entity engaged in an activity that may result in the discharge of air pollutants to comply with all applicable air pollution control laws and regulations (Federal, state, or local). It also directs the attainment and maintenance of NAAQS for six different criteria pollutants: carbon monoxide, ozone, particulate matter, sulfur oxides, oxides of nitrogen, and lead. Air quality in the project area is in attainment of NAAQS.

Short-term construction emissions (particulate matter) associated with the proposed project would have localized and minor effects on the air quality in the project vicinity. Ongoing sediment removal, distribution, and storage would result in minor increases in particulate matter. The project is not located in a nonattainment area or Class I airshed.

The Clean Water Act of 1977, as amended, strives to restore and maintain the chemical, physical, and biological integrity of the nation's waters by controlling the discharge of pollutants. The basic means to achieve the goals of the CWA is through a system of water quality standards, discharge limitations, and permits. Section 404 of the CWA identifies conditions under which a permit is required for actions that result in placement of fill or dredged material into jurisdictional Waters. In addition, a Section 401 water quality certification and a Section 402 National Pollutant Discharge Elimination System (NPDES) permit are required for activities that discharge pollutants to Waters. The EPA has delegated the responsibility to administer water quality certification and NPDES programs in Arizona to the ADEQ.

A Preliminary Jurisdictional Delineation of the project area would be prepared and submitted to the Corps for its concurrence. The rehabilitation of the Ashurst-Hayden Diversion Dam and headworks and the armoring of a segment of the south bank of the Gila River would require compliance with CWA Sections 404 and 401. The specific permits required would be determined based on a final or substantially complete design. An AZPDES Notice of Intent would be filed with the ADEQ, and a SWPPP would be implemented during project construction.

The National Historic Preservation Act of 1966, as amended, mandates that all federally funded undertakings that have the potential to affect historic properties are subject to Section 106 of the

NHPA. Federal agencies are responsible for the identification, management, and nomination to the NRHP of cultural resources that could be affected by Federal actions. Consultation with the ACHP and SHPO is required when a Federal action may affect cultural resources on, or eligible for inclusion on, the NRHP.

Archaeologists from Archaeological Consulting Services, Ltd., conducted an intensive Class III Survey of the APE. In total, 11 cultural properties and 35 isolated occurrences were recorded. The isolates do not meet ASM archaeological site criteria and are not considered significant; mapping and field recording have exhausted their information potential. Table 1 enumerates the 11 cultural properties: two prehistoric properties, eight historic-age properties, and one property with multiple temporal components. Several elements of the proposed action have the potential to affect known or possible historic properties (cultural resources listed on, or eligible for listing on, the NRHP). Reclamation would fulfill its compliance requirements under Section 106 of the NHPA by the following actions: consulting with Native American groups that may have interests or concerns to determine if there are traditional cultural properties or sacred sites in the APE; preparing eligibility assessments, as needed, for all cultural resources within the study area and consulting in that regard with SHPO and other interested parties; making a determination of effect for the proposed undertaking and consulting with SHPO accordingly; and developing a Memorandum of Agreement or Programmatic Agreement, if appropriate, that would stipulate development and implementation of a treatment plan prior to initiation of the sediment basin and storage areas by SCIDD.

The Resource Conservation and Recovery Act, as amended, establishes thresholds and protocols for managing and disposing of solid waste. Solid wastes that exhibit the characteristic of hazardous waste, or are listed by regulation as hazardous waste, are subject to strict accumulation, treatment, storage, and disposal controls.

The proposed project is unlikely to generate hazardous waste as defined and regulated under the Resource Conservation and Recovery Act.

Executive Order 11988 (Floodplain Management) requires Federal agencies to avoid, where practicable alternatives exist, the short- and long-term adverse impacts associated with floodplain development. Federal agencies are required to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibility.

Most of the study area is within the 100-year floodplain of the Gila River. The remaining study area is a designated 500-year floodplain.

With the proposed action, a building and other proposed facilities, including a settling basin, would be built, and sediment piles up to 30 feet high would be stored within the 100-year floodplain in relatively close proximity to the Gila River channel. Construction and stockpiling within the 100-year floodplain would be expected to increase the flood elevation, impound floodwaters upstream, and potentially erode sediment piles if and when floodwaters breach the established banks of the river channel. If required, a Floodplain Use Permit from the Pinal County Flood Control District would be obtained prior to the construction of any buildings or facilities or the storage of sediment within the 100-year floodplain.

Executive Order 11990 (Wetlands) requires Federal agencies, in carrying out their land management responsibilities, to take action that would minimize the destruction, loss, or degradation of wetlands and take action to preserve and enhance the natural and beneficial values of wetlands.

The proposed action would not affect any wetland areas.

Executive Order 12898 (Environmental Justice) requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations.

Because the project would not introduce disproportionately high and adverse human health and environmental effects on minority and low income populations, there would be no adverse effect as defined by this EO. See Section 3.4, Environmental Justice, for additional information.

Executive Order 13514 directs Federal agencies to promote pollution prevention and reduce emissions of GHGs from actions under their control. In accordance with EO 13514, the CEQ defines GHGs as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

The annual emission of CO_2-equivalent GHGs from the proposed action would be substantially below the annual threshold proposed by the CEQ as relevant to the decision-making process.

Secretarial Order 3175 (incorporated into Departmental Manual [DM] at 512 DM 2) requires that if any Department of the Interior agency actions impact Indian Trust Assets, the agency must explicitly address those impacts in planning and decision-making, and the agency must consult with the tribal government whose trust resources are potentially affected by the Federal action.

The Gila River Decree of 1935 recognized the right of the United States to demand and divert Gila River water for irrigation of 50,546 acres of Indian farmland located on the Gila River Indian Community. This water right is the one Indian Trust Asset identified for this project and its study area. The project would not alter Gila River water supplies available for diversion and would not interfere with irrigation water delivery. Construction and operation of a settling basin system and the storage of extracted sediment would improve irrigation water quality and delivery efficiency, and reduce long-term operating costs of the irrigation system, protecting and preserving this Indian Trust Asset.

The Farmland Protection Policy Act and 7 CFR 658 are intended to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural purposes. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, and oilseed crops and is available for these uses. In general, prime farmland has acceptable soil conditions with few rocks, a favorable temperature and growing season, and an adequate and dependable water supply from precipitation or irrigation. Unique farmland is land other than prime farmland that is used for production of specific high-value foods and fiber crops.

The NRCS has general responsibility nationwide for implementing the FPPA and to review projects that may affect prime, unique, or statewide important farmland and/or wetlands

associated with agriculture. The NRCS reviewed the proposed project and found that approximately 6 acres of prime and unique farmland soils would be impacted by the project.

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