United States Department of the Interior
Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, Suite C3
Phoenix, Arizona 85051
Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:
AESO/SE
02EAAZ00-2020-F-0490

August 4, 2020

Mr. Neil Bosworth
Forest Supervisor
Tonto National Forest
2324 East McDowell Road
Phoenix, Arizona 85006

RE: Pinto Valley Mine Operation and Expansion Biological and Conference Opinion

Dear Mr. Bosworth:

Thank you for your request for formal consultation and conference with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. *et seq.*), as amended (Act). We received your February 18, 2020, request for consultation, via electronic mail. At issue are adverse effects that may result from the proposed Pinto Valley Mine (PVM) Expansion and Operation in Gila County, Arizona, to the threatened yellow-billed cuckoo (*Coccyzus americanus*: cuckoo) and its proposed critical habitat.

In your letter and following subsequent biological assessment revisions, you requested our concurrence that the proposed action "may affect, but is not likely to adversely affect" the endangered southwestern willow flycatcher (*Empidonax traillii extimus*: flycatcher), ocelot *(Leopardus pardalis*), and Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*). We concur with your determinations and include our rationales in Appendix A.

In addition, you determined that the action would have "no effect" to the endangered Gila topminnow *(Poeciliopsis occidentalis).* "No effect" determinations do not require our review; therefore, we will not address this species further.

We based this biological and conference opinion on information provided in the revised April 30, 2020, BA, and subsequent electronic messages, telephone conversations, and other sources of information. Literature cited in this biological and conference opinion is not a complete bibliography of all literature available on the species of concern or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

Consultation History

- August 1, 2018: The Tonto National Forest (TNF) and FWS met to discuss upcoming PVM expansion.
- January 7, 2020: The TNF informed us that PVM has submitted a request to the TNF for applicant status and the TNF has accepted their request.
- February 18, 2020: The TNF submitted a BA and request to initiate formal consultation.
- March 2, 2020: PVM provide comments on the TNF's BA to the TNF and FWS.
- March 17, 2020: We met with the TNF to discuss the project.
- March 18, 2020: We sent a 30-day letter to the TNF. We included a clarification on southwestern willow flycatcher designated critical habitat. We identified flycatcher critical habitat exclusions correctly in the final rule's text. We explained that we excluded the Roosevelt Lake conservation space, up to elevation 2,151, from critical habitat under section 4(b)(2). Therefore, the Roosevelt Lake conservation space is not part of the final designation. However, the maps associated with the final rule incorrectly include a portion of Roosevelt Lake on the Salt River arm, within its conservation space. We recommended the TNF re-evaluate its analysis and determination for flycatcher critical habitat.
- April 1, 2020: We met with the TNF, its consultants, and PVM representatives via conference call to clarify outstanding items with the BA's proposed action.
- April 30, 2020: We received a revised BA from the TNF. Included in the new BA was a revised determination for the ocelot, from "no effect" to "may affect, but is not likely to adversely affect." In addition, following our guidance, you changed your southwestern willow flycatcher critical habitat determination from "not likely to adversely effect," to "no effect." Also included in the revised BA were clarifications to the action area, species accounts, conservation measures, and effects analysis.
- May 29, 2020: We sent a draft description of the proposed action to the TNF for review.
- June 3, 2020: We received input from the Forest Service on the draft proposed action
- June 16, 2020: FWS, TNF, and PVM had a status meeting on the draft BO.
- June 24, 2020: We sent the draft BO to the Forest Service for review.
- July 20 & 22, 2020: The Forest Service sent comments on the draft BO, and we addressed the comments and sent back the changes to the Forest Service.
- July 29, 2020: The Forest Service responded that they have no further comments on the draft BO and we can finalize the document.

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF THE PROPOSED ACTION

Regulations implementing the Act (50 CFR 402.02) define "action" as all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies of the United States or upon the high seas.

The following is a summary of the proposed action. The TNF's complete description of the proposed action occurs in the revised April 30, 2020 BA, and other supporting information in the administrative record, including the draft Environmental Impact Statement (DEIS) (USFS 2019). We include these documents herein by reference.

The TNF, an administrative unit of the U.S. Department of Agriculture Forest Service, is considering approval of Pinto Valley Mining Corp.'s mining plan for the PVM. The PVM is an existing open pit copper and molybdenum mine located in Gila County, Arizona, approximately eight miles west of the Town of Miami on private lands and on TNF in the Globe Ranger District (Appendix B, Figure 1). Capstone Mining Corp. operates the mine as Pinto Valley Mining Corp., a wholly owned indirect subsidiary. For simplicity, we refer to Capstone Mining Corp., Pinto Valley Mine, or Pinto Valley Mining Corp. as PVM in this consultation.

PVM is proposing to expand existing mining operations from private lands onto National Forest System (NFS) lands, extend the mine life by approximately 12 years (2027 to 2039), and consolidate prior authorizations and encroachments that are associated with extraction, transportation, and processing of mineral deposits on its mining claims (Appendix B, Figure 1 & Table 1). The TNF based their proposed action on PVM's mining plan of operations submitted to the Forest Service in May 2016. We summarize the proposed action below; it encompasses the following broad categories of actions that would extend the mine life by approximately 12 years:

- Consolidation of prior authorizations for construction and operation of various pipelines, transmission lines, roads, and mine plans of operations into a single mine plan of operations; including prior Forest Service Special Use Permits (Appendix B, Table 2).
- Approval of new operations on NFS lands including expansion of the Open Pit and Tailings Storage Facility Nos. 3 and 4 and construction and/or relocation of linear features (access roads, electrical power transmission lines, pipelines).
- Authorization of existing encroachments on NFS lands from activities associated to mining, such as roads, an equipment laydown yard, stormwater ponds, powder magazines, and a water pipeline and stand dispenser).

In addition to the activities that require Forest Service approval, the integrated mining includes PVM's actions on private lands that support ongoing and expanded mining operations.

While the Forest Service does not have authority for activities on private land, the actions on private lands are described and analyzed in the project's DEIS (USFS 2019) in accordance with 43 CFR 1508.25. These other activities on private lands are interdependent parts of the

integrated mining operations at the PVM, closely related to the proposed operations on NFS lands, and they generally would not occur unless the Forest Service takes action to reapprove previously authorized activities.

Because PVM is an existing, active mine, ongoing operations would likely continue if the Forest Service does not approve the proposed expansion of mining plan of operations. If the TNF does not approve the proposed expansion, but former permits are renewed, active mining at PVM could continue generally as described below, except PVM would not expand the Open Pit and Tailings Storage Facilities further onto the TNF. If the proposed action is not undertaken, PVM's projects active mining to continue through 2027, 12 years shorter than under the proposed action, after which time reclamation and post- closure would proceed generally as described in the BA.

PVM will begin final reclamation in 2040 and expects completion in 2052. Post-closure maintenance and monitoring will continue after final reclamation. Some post-closure monitoring and maintenance plans will extend approximately 30 years from the end of reclamation (approximately 2082). This estimated closure schedule may vary depending on numerous factors.

Existing Mining Operations

PVM is an ongoing operation and active facility footprints undergo frequent change. Existing surface disturbance generally corresponds to facility footprints between submittal of the mining plan of operations in May 2016 and additional information provided by PVM through April 2018.

Work Force and Traffic
PVM maintains a work crew of approximately 690 employees. The mine normally operates 24 hours per day, 365 days per year. Approximately 191,540 mine-related vehicle round trips to PVM from nearby communities and locations around the region occur annually.

Open Pit
The Open Pit is an existing, active facility encompassing approximately 745.8 acres of private land and approximately 8.5 acres of the TNF. The total depth of the pit from its base elevation of 2,645 feet above mean sea level (amsl) to its highest rim at 4,760 feet is 2,115 feet, and the approximate dimensions of the pit are 8,300 feet by 5,300 feet. PVM uses explosives to break up rock in the mining process in the Open Pit. Blasting only occurs between 10:00 a.m. and 2:00 p.m. PVM dewaters the Open Pit by several vertical wells with pumps and horizontal drains. Various catchments and associated diversion ditches divert stormwater runoff from the surrounding hillsides from the southern and northeastern wall slopes of the Open Pit.

Main Dump and Other Waste Rock Dumps
Overburden (waste rock) removed from the Open Pit during mining has been stored in various dumpsites at the PVM. Two waste rock dumps are currently active or in construction on private land: the Main Dump and the Castle Dome Marginal Dump. PVM plan to develop two additional dumps, the North Barn Marginal Dump and the West Dump, both of which overlay

prior disturbed areas. All other waste rock dumps are inactive and PVM has reclaimed some of the inactive dumps. Limestone is stored at the inert limestone stockpile. An existing solid waste landfill is located within the footprint of the Northside Dump; however, non-hazardous solid wastes are currently disposed offsite.

Borrow and Riprap Sources
Approximately 22.2 acres of private land are currently used as borrow and riprap (e.g. sand, gravel, cobble, etc.) sources for cover during reclamation.

Mill and Concentrator
As currently configured, the PVM runs copper-bearing ore above the current cutoff grade through the mill (i.e., grinding and crushing), then to the concentrator (i.e., machine process to concentrate copper into a slurry). Copper concentrate is stored on-site before transport to off-site smelters.

Cottonwood Tailings Impoundment
The Cottonwood Tailings Impoundment consists of an unlined tailings impoundment, embankment, and ancillary facilities. Approximately 43.8 acres of this inactive impoundment are located on private lands and 278.2 acres are located on the TNF. In 1988, inert material capped the surface and subsequently seeded with grasses. Several features of the impoundment are still active, including Arizona Pollutant Discharge Elimination System Outfall No. 005 near the southeastern corner of the facility. This feature discharges seepage to an unnamed wash that eventually flows to Pinto Creek.

Tailings Storage Facilities
Tailings Storage Facility No. 1 and Tailings Storage Facility No. 2 are inactive, unlined tailings storage facilities that merged over time into a single impoundment area occupying approximately 403.8 acres of private land. Tailings Storage Facility No. 1 is in reclaimed, post-closure status. Tailings Storage Facility No. 3 is an active facility that consists of an unlined tailings impoundment, sediment trap, and adjacent disturbed areas. The existing footprint of the Tailings Storage Facility No. 3 encompasses approximately 263.8 acres of private land and 5.7 acres of the TNF. Tailings Storage Facility No. 4 is an existing, active facility that encompasses approximately 703.9 acres of private land. Tailings Storage Facility No. 4 is the primary location for the disposal of tailings from the mill. PVM generally uses Tailings Storage Facility No. 3 as a backup.

Leach Piles, Pregnant Leach Solution Ponds, and Solvent Extraction and Electrowinning Plant
The leaching operation, Pregnant Leach Solution Ponds and ancillary facilities, and the Solvent Extraction and Electrowinning Plant encompass approximately 689.4 acres on private land. PVM pumps pregnant leach solution from leaching operations to the Solvent Extraction and Electrowinning Plant for copper removal, and then returned to the Leach Piles. Electrowinning, also called electroextraction, is the electrodeposition of metals from their ores that operators put in solution via a process commonly referred to as leaching. Electrorefining uses a similar process to remove impurities from a metal.

Roads
PVM uses approximately 32.6 miles of TNF roads to access the Pinto Valley Mine site and various PVM facilities on both patented and unpatented claims. Notable among these is National Forest System Road (FR) 287, which serves as the primary access to the Pinto Valley Mine. Forest Road (FR) 287 extends north 3.2 miles from US 60 to the PVM entrance gate as a paved two-lane road, then passes through the mine on private PVM property as an unimproved dirt road, and continues within the TNF west and north of the mine.

PVM also uses 14.5 miles of access roads constructed on surrounding TNF lands. Most of the access roads extend from TNF roads to access nearby facilities.

Utilities and Lighting
Salt River Project provides electrical power to the PVM through transmission lines and PVM–owned distribution lines (that cross both private property and TNF lands) deliver electricity to usage sites. Most of the electrical power lines follow various TNF road or access road alignments. A substation that provides power to the Pinto Valley Mine is located near the mill building. All PVM indoor lights are generally on 24 hours a day, 7 days a week, and most outdoor lights are on dusk to dawn photocells or timers.

Support Facilities
A plant site including support facilities on private land is located near the mill and concentrator.

Water Supply, Distribution, Use, and Treatment
Water supply, distribution, use, and treatment facilities used to operate PVM include wells, buried and surface pipelines, ponds, reservoirs, and storage tanks. Together, existing water-related facilities encompass an estimated 86.0 acres of private land and 71.7 acres of the TNF.

PVM has an average consumptive water use of 9,722 gallons per minute (plus or minus 20 percent). PVM uses approximately 2,536-acre-feet of fresh water per year and 13,146-acre-feet of reclaimed water for a total of 15,682 acre-feet of water per year from all sources. Water sources utilized by the PVM include the Peak Well System, the Burch Pipeline System, Tailings Storage Facility No. 4 reclamation water, and water pumped from the Open Pit.

- The Peak Well System is located northwest of the active mine site, along and west of Pinto Creek. The Peak Well System includes 22 industrial water supply wells and a potable water supply well. The average annual water production rate is 3,500 gallons per minute. The Peak Well System, developed in the mid-1970s, provides much of the fresh water used at the site, and transports water to the mine via surface and buried pipelines. The Peak Well System also collects and pumps seepage from Tailings Storage Facility No. 4 for reuse onsite.
- The Burch pipeline transports water from the BHP Copper Cities Diamond H Pit west to the PVM. Flow in the Burch pipeline currently ranges from 1,500 to 1,800 gallons per minute, but the pipeline can accommodate flows in excess of 3,300 gallons per minute.
- Tailings Storage Facility No. 4 and Open Pit pumping produce 4,200 and 300 gallons of reclaimed water per minute, respectively.

Twenty-four water supply reservoirs, stormwater management ponds, and seepage collection ponds are present within the PVM project boundary. Within the PVM boundary, the altered topography supports a stormwater and seepage management system. PVM maintains the site as a non-discharging area where stormwater runoff is contained within impoundments and water containment systems. PVM designs and manages the majority of the stormwater management system to contain the 100-year, 24-hour storm event, but PVM designs some areas to meet the 10-year, 24-hour storm event. Discharge from the PVM facilities occurs only at monitored discharge points. PVM implements a Stormwater Pollution Prevention Plan for all PVM facility operations on private and public lands, in accordance with the requirements of the Arizona Pollutant Discharge Elimination System stormwater multi-sector general permit. PVM also maintains coverage under an individual Arizona Pollutant Discharge Elimination System permit for process water and stormwater discharges that do not qualify for coverage under the stormwater multi-sector general permit.

PVM treats sewage wastewater in an on-site plant. Effluent is chlorinated and the treated water is stored in an onsite tank, and then returned to the process water circuit for reuse.

Mine Expansion Actions

Under the proposed action, PVM expansion for recoverable copper production may continue through 2039, to extend the mine life by approximately 12 years. The actual mine life may be shortened or lengthened depending on actual annual production rates achieved and other factors.

Open Pit
PVM will use the Open Pit in the same manner as it is used currently, but will extend the Open Pit to the north and west onto 218.9 additional acres of previously disturbed private land and extend east onto 18.9 acres of disturbed and undisturbed TNF lands by 2039. Continued excavation will increase total depth of the pit to a base elevation of approximately 2,240 feet amsl. PVM will subsume existing infrastructure including a buried pipeline, electrical power line, powder magazine buildings, and existing stormwater ponds by the expanded pit.

Main Dump and Other Waste Rock Dumps
PVM will expand the footprint of the Main Dump on private land from approximately 95.8 acres to 456.8 acres. This facility overlies the existing Leach Piles. PVM will expand the Inert Limestone Stockpile onto approximately 47.8 acres of private land outside the footprint of the Main Dump. The Castle Dome Marginal Dump footprint on private land will expand from approximately 24.7 acres to 44.4 acres. PVM will construct two new dumps on private land. The footprint of the planned North Barn Marginal Dump will be approximately 36.4 acres, all of which would be located in areas of existing disturbance. The planned West Dump would extend onto 247.1 acres in Gold Gulch. The 19 Dump is an existing, inactive dump encompassing approximately 75.7 acres of TNF land. The 19 Dump would remain inactive, but a PVM will likely remove a portion of the stored overburden for use as cover material to reclaim certain features at the end of mine life.

Borrow and Riprap Sources
PVM has identified up to 708.9 additional acres on private land and 170.9 acres of TNF land for use as future borrow and riprap sources. PVM will generate three new borrow source stockpiles, totaling approximately 44.2 acres on TNF lands from material excavated during the Tailings Storage Facility No. 4 perimeter road construction.

Tailings Storage Facilities
PVM will extend Tailings Storage Facility No. 3 onto approximately 21.1 additional acres of private land and 21.5 acres of undisturbed TNF land to store a larger quantity of tailings. PVM will raise the top elevation of Tailings Storage Facility No. 3 from 3,750 feet amsl to 3,860 feet amsl. The Tailings Storage Facility No. 3 supernatant pond may extend onto the TNF as the impoundment expands and PVM may modify the reclaimed water system from its current trailer-mounted pump configuration. PVM may install a barge pump with electrical power lines and return water line in the pool, and depending upon the size and depth of the pond, could occur on TNF land.

PVM will expand Tailings Storage Facility No. 4 onto 406.2 acres of private land and 102.0 acres of undisturbed TNF lands, resulting in a total footprint of 1,212.1 acres. PVM will subsume portions of Eastwater Canyon and existing roads and electrical power lines near Tailings Storage Facility No. 4 by the expanded facility. PVM will develop Tailings Storage Facility No. 4 to a maximum elevation of 4,250 feet amsl. PVM will move one and possibly both of the existing barge-mounted pumps and related pipeline for the reclaimed water system to TNF land to accommodate the supernatant pond when it extends onto TNF land.

Leach Piles, Pregnant Leach Solution Ponds, and Solvent Extraction and Electrowinning Plant
PVM anticipates terminating the leaching operation, dependent on the economic viability of the operation. If PVM terminated leaching operations, the Pregnant Leach Solution Ponds and ancillary facilities would continue use as the Leach Piles drain down. The expansion of the Main Dump, West Dump, and Open Pit Much will subsume much of the existing leaching operation. Placement of material in the West Dump requires that PVM relocate the leaching collection pond.

Roads
Within PVM's private property, they will periodically alter FR 287 alignment as the mine builds or reclaims facilities. PVM may realign some existing haul and access roads on private land to accommodate the mine and subsume some existing access by expansion of the Open Pit and tailings storage facilities. PVM will construct a new perimeter road around the proposed final footprint of the Open Pit. PVM will also construct a 2.7-mile long perimeter access road around the proposed final footprint of Tailings Storage Facility No. 4 to provide access to the facility for monitoring purposes.

Utilities
There is no anticipated change in power requirements from current levels. PVM may realign some existing electrical power lines on private land to accommodate local earthwork. PVM will subsume portions of the electrical infrastructure by the further development of the Open Pit and Tailings Storage Facility No. 4. PVM will construct a new power line on TNF lands to provide

power for the continued operation of the Tailings Storage Facility No. 4 reclaim barge as the supernatant pond extends up Eastwater Canyon in a southeasterly direction.

Exploration Activities
Occasionally, PVM may conduct exploration on private and TNF land. The TNF would detail any proposed PVM exploration activities on NFS lands in a notice of intent or project-specific mining plan of operations and subject to review and approval under the National Environmental Policy Act (NEPA).

Water Supply, Distribution, Use, and Treatment
PVM will use water at the current rate for the duration of active mining operations; that is, the mine would use approximately 2,536-acre-feet of fresh water per year and 13,146-acre-feet of reclaimed water for a total of 15,682 acre-feet of water per year from all sources. As a result, PVM operations would use an estimated 297,952 acre-feet of water from 2020 to 2039, including 48,177 acre-feet of fresh water.

PVM's use of the Peak Well System, Burch Pipeline, and the reclaimed water sources will generally continue as described under the existing conditions. PVM will relocate the northernmost segment of the Burch Pipeline to accommodate the expanded Open Pit and install one water pipeline to Peak Well 11. PVM will reinstall a pipeline to Peak Wells 11 and 13, adding 1.9 miles to the current Peak Well pipeline system. Two water pipeline segments extending southeast from Peak Well 21 along FR 38 2500 and FR 2501 and south along FR 312 near Peak Well 14 are no longer in use and will be removed. PVM will replace other segments of the Peak pipelines as needed. A second, inactive pipeline follows the Burch Pipeline alignment on private property and TNF land. PVM will replace segments of the Burch pipeline as needed, and may remove portions of the inactive adjacent line during the Burch pipeline maintenance and replacement. The Open Pit will subsume some existing stormwater ponds in encroachment areas. The expansion of the Open Pit, Tailings 1 Storage Facility No. 3 and Tailings Storage Facility No. 4 will result in the reconfiguration of some stormwater management structures.

Reclamation

The primary reclamation policy objective for the TNF is to ensure the return of disturbed lands to a use that is consistent with long-term land and resource management plans. The TNFs current and historic land uses surrounding PVM include low-density cattle grazing, public recreation, and mining activities. PVM has identified a range of post-closure land uses for the PVM that are consistent with these nearby uses including outdoor recreation, grazing, and wildlife habitat.

PVM may complete reclamation in three phases: interim, concurrent, and final reclamation. Interim reclamation consists of activities intended to stabilize facilities, but does not include final closure; concurrent reclamation consists of closure activities that are undertaken while other components of the mine are operational; and final reclamation consists of the activities to close the site and prepare it for post-mining use.

PVM's mining plan of operations proposes to accomplish most reclamation by covering large facilities with inert material such as Gila conglomerate from the project site. PVM may use soil from adjacent areas for reclaiming access roads and the Mine Reservoir. Final reclamation actions include:

1. Demolishing and restoring roadways not required for post-closure access;
2. Demolition of most buildings and parking lots;
3. Backfilling of most ponds, reservoirs, and ditches;
4. Removal of surface pipelines;
5. Closure of buried pipelines
6. Removal of overhead power lines and transformers;
7. Removal of closed wells;
8. Erosion and drainage control;
9. Soil remediation, where needed;
10. Reseeding of disturbed areas; and,
11. Placement of fencing around the Open Pit to restrict access to the public and wildlife.

PVM will reclaim most disturbed areas; however, ancillary buildings on private property, such as the administration building and mine office, may remain to serve as headquarters during reclamation and post-closure activities. PVM may permanently retain these buildings following a future assessment of their potential for commercial use.

PVM anticipates closure construction will take three years. However, Tailings Storage Facility No. 4 and Tailings Storage Facility No. 3 may require as many as 10 years of consolidation (draindown) prior to performing regrading activities on the impoundment surfaces. Upon final reclamation, PVM will contour disturbed areas to re-establish natural drainage patterns. PVM will create new drainages where the former drainage patterns no longer function.

Post-Closure

Post-closure reclamation activities would include maintenance and monitoring to ensure that the closed facilities meet reclamation goals. Activities conducted during this phase will primarily consist of visual inspections with minor repair and facility upkeep. The maintenance period will require three years and will occur for three weeks during the summer of each year. PVM will maintain and monitor facilities and reclamation structures on TNF lands during the post-closure period, including selected access roads, constructed water diversion channels and berms, reclaimed areas, security fences and gates, and surface water monitoring locations. During this period, PVM will also meet Aquifer Protection Permit and Mined Land Reclamation Plan maintenance and monitoring requirements. For Aquifer Protection Permit permitted discharging facilities, the monitoring period will last for up to 30 years, also commencing at the start of the post-closure care period.

Conservation Measures

PVM proposes to implement monitoring and mitigation plans to minimize effects to the yellow-billed cuckoo and its proposed critical habitat.

- PVM will conduct yellow-billed cuckoo surveys every three years for the duration of active mining or until it is delisted. PVM is developing specific survey and monitoring procedures as part of a PVM Biological Resources Monitoring and Mitigation Plan and will update the plan as needed to address future changes that may occur in the bird's listing status or its proposed critical habitat.

- PVM will monitor Pinto Creek riparian habitat and yellow-billed cuckoo proposed critical habitat along Pinto Creek. PVM is developing specific monitoring procedures as part of the PVM Biological Resources Monitoring and Mitigation Plan that will monitor the physical and biological features (PBFs) of yellow-billed cuckoo proposed critical habitat within the action area and identify impact thresholds. If monitoring identifies that thresholds are exceeded and attributable to PVM activities, then PVM will coordinate with TNF to identify appropriate actions and/or mitigation measures to address the identified effects.

- In addition to monitoring Pinto Creek, riparian habitat and yellow-billed cuckoo proposed critical habitat as part of the Biological Resources Monitoring and Mitigation Plan, PVM would also implement a Comprehensive Water Resource Monitoring and Mitigation Plan. PVM is designing the Comprehensive Water Resource Monitoring and Mitigation Plan to monitor both groundwater and surface water resources within the action area. If monitoring identifies that thresholds are exceeded and attributable to PVM activities, then PVM will coordinate with TNF to identify appropriate actions and/or mitigation measures to address the identified effects.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest-reaching physical, chemical, and biotic effects of the action on the environment.

The action area consists of the entire PVM footprint on TNF lands and interrelated actions on private land, including existing operations and future mine expansion and areas beyond the footprint affected by water extraction surface disturbance, traffic, artificial lighting, dust, noise, water withdrawals, and contamination of water resources. The overall action area includes approximately 40 square miles around the PVM (Appendix B, Figure 1).

STATUS OF THE SPECIES AND CRITICAL HABITAT

Western Yellow-billed Cuckoo

We listed the western yellow-billed cuckoo as threatened on October 3, 2014 (79 FR 59992). We listed the Western Distinct Population Segment (DPS), which is larger than its eastern counterpart is. We proposed western yellow-billed cuckoo critical habitat on August 15, 2014 (79 FR 48548), and revised proposed critical habitat on February 27, 2020 (85 FR 11458).

The primary threat to the western yellow-billed cuckoo is loss or fragmentation of riparian nesting habitat. Many factors have altered and eliminated cuckoo habitats, including water diversions, ground water pumping, stream channelization and stabilization, agricultural development, mining, livestock grazing, wildfires, establishment of nonnative vegetation, drought, defoliation of tamarisk by the introduced tamarisk leaf beetle, and prey scarcity due to pesticides (Ehrlich *et al*. 1992, Corman and Wise-Gervais 2005, 79 FR 48548, 79 FR 59992). Habitat fragmentation has led to the isolation of small populations and has increased their susceptibility to further declines and local extirpations due to all the factors discussed above and to stochastic factors such as weather, fluctuating prey populations, and climate change (Thompson 1961, McGill 1975, Wilcove *et al*. 1986).

Cuckoos in the DPS were formerly widespread and locally common in much of the western U.S., Canada, and Mexico (American Ornithologists' Union 1998, Hughes 1999). The largest remaining breeding areas are in southern and central California, Arizona, New Mexico, and northwestern Mexico (79 FR 59992). In Arizona, the species was a common resident chiefly in the lower Sonoran zones of southern, central, and western Arizona (Phillips *et al*. 1964). The cuckoo now nests primarily in the central and southern parts of the state.

Western populations of the cuckoo are most commonly found in large tracks of dense, multi-layered gallery forests consisting primarily of cottonwood (*Populus* spp.), willow, and mesquite (*Prosopis* spp.) (including mesquite bosques) along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999). Breeding cuckoo home range size is likely related to large tracts of riparian habitat, although home ranges are flexible and territories may overlap in this weakly territorial species (Hughes 1999, Halterman 2009, Sechrist *et al*. 2013). Rangewide, individual home ranges during the breeding season average over 100 acres (Laymon and Halterman 1987, Laymon *et al*. 1997, Laymon and Williams 2002, Halterman 2009, Sechrist et al. 2009, McNeil *et al*. 2011, 2012, 2013, Sechrist *et al*. 2013). However, Laymon *et al*. (1993) reported an average cuckoo home range size of 42 acres, and home range estimates for radio-telemetered cuckoos in New Mexico varied from 12 to 697 acres (Sechrist et al. 2009). In New Mexico, the average maximum daily distance traveled was 2,795 feet, (0.52 mile) and the average maximum seasonal distance traveled was 4,790 feet (0.91 mile).

Extensive riparian forests may support the greatest density of breeding cuckoos, but other habitats are also important for recovery (USFWS 2015). In Arizona, cuckoos may use narrow bands of riparian woodland for nesting (AGFD 2015, Cornell Lab of Ornithology 2015) and even non-riparian habitats (e.g., Madrean evergreen woodlands in the mountain drainages of southeastern Arizona) (Brown 1994, Cornell Lab of Ornithology 2015, Corman and Magill 2000). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component present (Gaines and Laymon 1984, Johnson *et al*. 2008, McNeil *et al*. 2013, Carstensen et al. 2015). Site-specific variation is likely a result of characteristics unique to each location (e.g., type and quality of habitat, patch configuration) (Hughes 1999, Halterman 2009, Sechrist *et al*. 2013). Cuckoo habitat occurs in relatively contiguous stands of dense vegetation, in irregularly shaped mosaics of dense and open vegetation, and in patches that are narrow and linear or savannah-like.

Humid conditions created by surface and subsurface moisture and a multi-layered canopy appear to be important for successful hatching and rearing of young (Hamilton and Hamilton 1965, Gaines and Laymon 1984). Within the boundaries of the DPS, cuckoos occur from sea level to elevations up to 7,000 feet or more; however, the moist conditions that support riparian plant communities typically occur at lower elevations.

Cuckoo breeding habitat in much of the species' range is associated with perennial rivers and streams in regulated and unregulated flows (Poff *et al*. 1997). In southeastern Arizona, nesting cuckoos also occur along more arid, ephemeral, and intermittent drainages (Corman and Magill 2000, Corman and Wise-Gervais 2005, AGFD 2015, Cornell Lab of Ornithology 2015). Hydrologic conditions at cuckoo breeding sites can vary widely in a single year and among years, and due to these changes, cuckoos may move from one area to another in the same season and from year to year.

Recent guidance on cuckoo habitat use (USFWS 2015) indicates that cuckoos are more flexible in their choice of foraging and migration stopover habitat than they are in selecting nesting habitat. Foraging areas can be less dense and patchy than nesting areas, with lower levels of canopy cover (Carstensen *et al*. 2015, Sechrist *et al*. 2009, USFWS, unpubl. data). In Arizona, adjacent foraging habitat is usually more arid than nesting habitat. Habitat flexibility during migration may extend to monotypic tamarisk and shrubby habitats, hedgerows, coastal scrub, orchards, and semi-desert grasslands.

Western Yellow-Billed Cuckoo Proposed Critical Habitat

On February 27, 2020, we proposed approximately 493,665 acres as cuckoo critical habitat in eight states, including Arizona (85 FR 11458). We proposed the following PBFs for cuckoo critical habitat:

<u>PBF 1—Riparian woodlands; mesquite woodlands (mesquite-thorn-forest), and Madrean evergreen woodland drainages.</u>

- Rangewide breeding habitat (including areas in the Southwest) – woodlands within floodplains or in upland areas or terraces often greater than 325 feet in width and 200 acres or more in extent with an overstory and understory vegetation component in contiguous or nearly contiguous patches adjacent to intermittent or perennial watercourses. The slope of the watercourses is generally less than 3 percent but may be greater in some instances. Nesting sites within the habitat have an above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

- Southwestern breeding habitat – composed of more arid riparian woodlands (including mesquite bosques), desert scrub and desert grassland drainages with a tree component, and Madrean evergreen woodlands (oak and other tree species), in perennial, intermittent, and ephemeral drainages. These more arid riparian woodland drainages also bisect other habitat types, including Madrean evergreen woodland, native and nonnative desert grassland, and desert scrub. More than one habitat type within and adjacent to the

drainage may contribute toward nesting habitat. Southwestern breeding habitat is more water-limited, contains a greater proportion of xero-riparian and non-riparian plant species, and is often narrower, more open, patchier, or sparser than elsewhere in the DPS and may persist only as narrow bands or scattered patches along the bankline or as small in-channel islands. The habitat contains a tree or large-shrub component with a variable overstory canopy and understory component that is sometimes less than 200 acres. Riparian trees (including xero-riparian) in these ecosystems may even be more sparsely distributed and less prevalent than non-riparian trees. Adjacent habitat may include managed (mowed) nonnative vegetation or terraces of mesquite or other drought-tolerant species within the floodplain. In narrow or arid ephemeral drainages, breeding habitat commonly contains a mix of non-riparian vegetation found in the base habitat as well as riparian (including xero-riparian) trees.

PBF 2—Adequate prey base.

Presence of prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies, moth larvae, spiders), lizards, and frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.

PBF 3—Hydrologic processes, in natural or altered systems, that provide for maintaining and regenerating breeding habitat.

This physical or biological feature includes hydrologic processes found in rangewide breeding habitat as well as additional hydrologic processes unique to the Southwest in southwestern breeding habitat:

- Rangewide breeding habitat hydrologic processes – Hydrologic processes (either natural or managed) in river and reservoir systems that encourage sediment movement and deposits and promote riparian tree seedling germination and plant growth, maintenance, health, and vigor (e.g., lower-gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). In some areas where habitat restoration is occurring, such as on terraced slopes above the floodplain, this may include managed irrigated systems that may not naturally flood due to their elevation above the floodplain.

- Southwestern breeding habitat hydrologic processes – In southwestern breeding habitat, elevated summer humidity and runoff resulting from seasonal water management practices or weather patterns and precipitation (typically from North American Monsoon or other tropical weather events) provide suitable conditions for prey species production and vegetation regeneration and growth. Elevated humidity is especially important in southeastern Arizona, where cuckoos breed in intermittent and ephemeral drainages.

Previous Consultations

Given the wide-range of the cuckoo, many Federal actions affect this species every year. A complete list of all formal consultations affecting the cuckoo in Arizona is located on our Arizona Ecological Services website.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present effects of all Federal, State, or private actions and other human activities in the action area, the anticipated effects of all proposed Federal projects in the action that have already undergone formal or early section 7 consultation, and the effect of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

The PVM has operated continuously since 1974 with the exception of periods of curtailed Open Pit mining operations in 1983, from 1998 to 2007, and from 2008 to 2012. PVM utilizes conventional open-pit hard rock mining methods employing drilling, blasting, loading, and hauling to extract copper-bearing sulfide ore. PVM extracts ores bearing copper and molybdenum from the Open Pit. As a result, we are evaluating the existing ongoing mine operations described in the Proposed Action (USFS 2020) and the draft EIS (USFS 2019) that have contributed to the existing Environmental Baseline. Original source material described in the baseline is cited within the TNF's BA (USFS 2020) and draft EIS (USFS 2019).

The action area, including PVM and the surrounding TNF, ranges from approximately 4,900 feet amsl to 2,800 feet amsl. Elevation generally decreases from south to north and slopes downward toward Pinto Creek. Pinto Creek is the main drainage within the action area, flowing past PVM and then outside of the action area into Roosevelt Lake. The topography within the action area contains steeply sloped, high relief mountains, ridges, and incised drainages. The geology of the action area consists of granite, limestone, sandstone, dacite, and conglomerate.

Within the PVM footprint, the topography and habitat has been altered by mining activities (open pit, etc.) and associated actions (buildings, roads, transmission lines, etc.). Existing surface disturbance associated with the PVM currently encompasses an estimated 3,915 acres. Less altered landscape and habitat occur on the surrounding TNF.

Other disturbance within the action area includes the Carlota Copper Mine, a conventional open pit copper mine located adjacent to the PVM on the west side of Pinto Creek. Unpaved TNF roads occur throughout much of the action area. Notable roads within the action area include FR 287, which provides access to the PVM, Carlota Copper Mine, and NFS lands to the west.

Pinto Creek is the main watershed in the action area, with other smaller tributaries/drainages such as West Fork Pinto Creek, Horrel Creek, Miller Springs and Gold Gulch, and Eastwater and Apache Canyons. Pinto Creek begins as an intermittent stream in the Pinal Mountains. Pinto

Creek is adjacent to the western side of PVM and bisects the Peak Well Field as it continues north to its confluence with the Salt River at Roosevelt Lake. Approximately 2,000 feet of Pinto Creek occurs on private land owned by PVM, otherwise Pinto Creek occurs on the TNF.

Pinto Creek is mostly perennial and dynamic flows vary from season to season based on precipitation, drought, man-caused water and land stressors, and other factors. The current perennial section generally extends from Miller Springs Gulch at the southern end of the action area downstream to West Fork Pinto Creek. A separate perennial portion of Pinto Creek begins at the northern boundary of the action area and extends downstream to the vicinity of Blevens Wash. Perennial flows within Pinto Creek during wet periods include a combination of surface runoff and groundwater discharge, whereas groundwater discharge sustains flows during the low-flow period.

Pinto Creek in its entirety is classified as "impaired" by the Arizona Department of Environmental Quality (ADEQ) due to high levels of copper (USFS 2020). The ADEQ considers Pinto Creek impaired downstream of West Fork Pinto Creek and PVM due to high levels of selenium (USFS 2020). The abandoned Gibson Mine upstream of the PVM is the largest source of copper to Pinto Creek, and remediation projects completed at the mine since 2007 have reduced the dissolved copper concentrations by 85 percent (USFS 2020). Abandoned mines in the upper Pinto Creek watershed were cleaned up during an extensive Comprehensive Environmental Response, Compensation, and Liability Act project from 2017-2018 (USFS 2020).

PVM's main water source is reclaimed water, and the primary source of make-up water is extracted groundwater from the Peak Well System on the east and west sides of Pinto Creek (USFS 2020). Ongoing groundwater extraction has resulted in drawdown of the Pinto Creek water table near PVM and Peak Well Field (USFS 2020). The PVM draft EIS included groundwater model to estimate effects on groundwater and surface water resources resulting from groundwater extraction and water management activities (USFS 2019). SRK Consulting Inc. calibrated their model to both a quasi-steady-state and transient conditions (USFS 2020). The quasi-steady state period extended from January 2011 through December 2012 and corresponded to PVM's care and maintenance period when minimal groundwater extraction occurred. The transient period for model calibration was from January 2013 through December 2018, during which time PVM was operational. At the end of 2018, the simulated groundwater drawdown associated with PVM consisted of two separate drawdown cones: one associated with the Peak Well System, and the other that consists of a drawdown area around the Open Pit and adjacent areas west of the Open Pit. The model results predicted that from 2013–2018, Pinto Creek baseflow was substantially reduced from an initial rate of 1,070 gallons per minute to 188 gallons per minute. This represented an 82 percent reduction in baseflow compared to the estimated average baseflow conditions at the end of 2012.

This groundwater drawdown and associated reduction in Pinto Creek baseflow are indicative of stressors that can reduce riparian vegetation and aquatic conditions (Stromberg *et al.* 1996). The Arizona Game and Fish Department (AGFD) noted abnormally high tree mortality during a November 2017 visit to Pinto Creek between PVM and a point 1.5 miles downstream (USFS 2020). AGFD described that tree mortality decreased as they moved downstream (USFS 2020).

AGFD also described that tree mortality appeared to be divergent from other nearby riparian systems in the action area such as West Fork Pinto Creek (USFS 2020). A comparison of available aerial imagery indicated that riparian tree canopy along Pinto Creek appeared to be healthy in 2012, with mortality occurring between 2013 and 2015 (USFS 2020). Between 2007 and 2018, Miller Ecological Consultants, Inc. observed dead trees, dry aquatic sample sites, and the replacement of pool habitat by riffles and glides along Pinto Creek and Haunted Canyon (USFS 2020).

Status of the species and proposed critical habitat within the action area

Surveyors have conducted yellow-billed cuckoo surveys in and around the immediate PVM action area since at least 1993, documenting regular cuckoo occurrence (USFS 2020) (Figure 2).

- In 1993, Southwestern Field Biologists detected one cuckoo within the action area near the Iron Bridge and two other cuckoos downstream of the action area. Also in 1993, two incidental cuckoo detections occurred outside of the action area within the Pinto Creek drainage.
- In 2004, the Bureau of Reclamation (Reclamation) surveyed 2.2 miles of Pinto Creek just downstream of the action area, recording three cuckoo responses during the second survey period in mid-July during the breeding season.
- In 2008, Westland Resources surveyed a short 0.2-mile area near Eastwater Canyon and the PVM expansion tailings facility without detecting cuckoos.
- AGFD's Heritage Data Management System describes one 2011 cuckoo detection downstream of the action area, and two 2012 cuckoo detections near the Iron Bridge within the action area.
- In 2015, Westland Resources surveyed 1.9 miles of Pinto Creek, 1.0 mile of Gold Gulch, and 1.2 miles of Eastwater Canyon within the action area, without detecting cuckoos.
- In 2016, Westland Resources surveyed the same areas from 2015, detecting three cuckoos along Pinto Creek.
- In 2017, Westland Resources surveyed the same 2015-2016 areas, detecting one cuckoo on Pinto Creek.
- In 2017, Audubon Arizona surveyed for cuckoos south of the action area along 0.8 mile of Pinto Creek near Haunted Canyon, 0.6 mile of Pinto Creek near Eastwater Canyon within the action area, and 1.3 miles of West Fork Pinto Creek within and outside the action area without detecting cuckoos.

Surveyors have recorded cuckoos regularly through time, over a broad area, and at repeated locations (i.e., Iron Bridge) along Pinto Creek within and adjacent to the PVM action area (USFS 2020). Because surveyors detected cuckoo occurrences through time and during the breeding season along Pinto Creek (taking into account its reclusive nature and inconsistent survey methodology), we concluded that cuckoos likely bred along Pinto Creek "at the time of listing" (85 FR 11458 and 11486). Reclamation cuckoo detections during the July 12 and 13, 2004, breeding season included cuckoos in close proximity and on consecutive days at the same area (Sferra 2004), providing strong indications of a breeding territory. In addition, a TNF biologist recorded a cuckoo during the July 2011 breeding season. Riparian habitat appropriate for cuckoo breeding territories consists of flowing water with a mix of young and mature tree

species. Because surveyors detected cuckoos over a long period along Pinto Creek and during the breeding season, we identified Pinto Creek as a core cuckoo conservation area (85 FR 11486).

None of the most recent 2015-2017 Westland Resources and Audubon surveys/detections, using the FWS approved protocol (Halterman *et al*. 2015), satisfied the criteria for establishing a cuckoo breeding territory (nesting behavior observed or detections over multiple visits) (USFS 2020). Breeding cuckoos are known to be responsive to changing hydrologic and habitat conditions, moving from one area to another in the same season and from year to year (85 FR 11460-11461). This most recent survey period coincided with the decline in riparian habitat conditions along Pinto Creek (USFS 2020), as described in the Environmental Baseline.

Although we have not compiled cuckoo breeding territory numbers for the Tonto Basin area, breeding cuckoos occur on a variety of creeks and rivers other than Pinto Creek. Breeding cuckoos have occurred on Tonto Creek from Gisela downstream to Roosevelt Lake, including tributaries like Rye and Cucamunga Creek. Additionally, breeding cuckoos occur within the Roosevelt Lake conservation space where Tonto Creek and the Salt River converge. Cuckoos also breed on the Salt River Arm of Roosevelt Lake at the off channel Rockhouse Demonstration Restoration Site, Pinal Creek, and Cherry Creek. We anticipate that future surveys are likely to detect cuckoos in other Tonto Creek and Salt River tributaries. These streams retain the natural hydrologic regime, and in the case of Roosevelt Lake, is where water is stored, generating the dynamic conditions and elevated groundwater to support cuckoo breeding habitat.

Proposed critical habitat

Two proposed critical habitat segments occur completely or partially within the PVM action area (85 FR 11486) (Figure 2). Pinto Creek South (Unit 26) is a 4-mile-long segment between Haunted Canyon and West Fork Pinto Creek. Pinto Creek South parallels the western edge of the PVM project boundary and about 254 acres occur within the action area. Pinto Creek North (Unit 29) is a 6-mile-long segment from the northern end of the PVM project boundary to a point 1.3 miles south of Blevens Wash. Approximately 54 acres of Unit 29 along a 0.7-mile-long segment of Pinto Creek occur within the action area.

As described in the Environmental Baseline, AGFD and Miller Ecological Consultants noted Pinto Creek riparian tree mortality, dry aquatic sites, and changed stream condition within proposed cuckoo critical habitat in 2017 and 2018 (USFS 2020).

Within Tonto Basin near Pinto Creek, but outside the action area, we proposed cuckoo critical habitat on Tonto Creek (3,669 ac), Pinal Creek (419 ac), and the Salt River (2,590 ac).

Factors affecting the species and proposed critical habitat within the action area

The action area consists private PVM land and the surrounding TNF (Figure 1, Table 1). Currently, ongoing PVM mining and associated actions (light, traffic, dust, noise, etc.), including groundwater withdrawal from the Peak Well Field, can influence cuckoos or the quality of cuckoo riparian habitat and proposed critical habitat along Pinto Creek (USFS 2019, 2020).

ADEQ identified mining as the source of Pinto Creek water quality impairment (including inactive mines), the only other active mine along Pinto Creek is the Carlotta Mine (USFS 2019, 2020). TNF land use and management actions such as cattle grazing and recreation may have broader watershed and more site-specific influences, affecting riparian habitat quality within and surrounding the action area. However, Pinto Creek in the action area has limited recreation concentration.

Previous consultations in the action area

No previous section 7 consultations have occurred within the action area for PVM activities. We evaluated the nearby Carlotta Mine in 1996 for lesser long-nosed bats and Arizona hedgehog cactus (2-21-92-F-419). We conducted evaluations for the Tonto National Forest Management Plan (02E00000-2012-F-0011-R001/02EAAZ00-2020-F-0206) and Pinto Creek, Bohme, Sleeping Beauty, and Bellevue grazing allotments (2-21-99-F-300) surrounding PVM.

EFFECTS OF THE ACTION

In accordance with 50 CFR 402.02, effects of the action are all consequences to listed species or critical habitat caused by the proposed action, including the consequences of all other activities that the proposed action causes. The proposed action causes a consequence if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see §402.17).

Effects of the action to the western yellow-billed cuckoo and its habitat

Based upon the results from current multiple years of effort (2015-2017), surveyors did not detect breeding cuckoos within the PVM action area (USFS 2019, 2020). Declining habitat conditions along Pinto Creek may be contributing to a lack of breeding cuckoos in the area. As a result, we are not evaluating effects to existing cuckoos nesting within the action area, leaving our analysis to migrating or dispersing cuckoos that use the action area temporarily for food and shelter, and cuckoo habitat and recovery.

We do not anticipate ongoing and future PVM mining-specific actions (extraction, development, exploration, leaching, borrow, tailings storage, etc.) reclamation or post closure actions will adversely affect migrating/dispersing cuckoos or its habitat. PVM's existing footprint and expanded mining activities (open pit, pit lake, tailings facility, etc.) and reclamation/post-closure activities do not occur in cuckoo habitat. This list of existing and future mining occurs in cleared areas or upland areas where preferred cuckoo habitat is absent. Expanded mining areas will mostly clear upland areas without the cover and vegetation that reclusive cuckoos prefer. The exceptions are 2.2 miles of ephemeral drainage surface disturbance, including small areas along Eastwater Canyon (0.6 mile) and Gold Gulch (0.5 mile), resulting in clearing 1-2 riparian acres for mine expansion. These ephemeral drainages are not locations where surveyors have detected cuckoos or areas we anticipate they rely upon, and the amount of habitat disturbance is relatively small. Migrating or dispersing cuckoos may travel through or by the PVM mining footprint, because they are not defending a territory or actively nesting. However, we do not expect

cuckoos will be attracted to or rely upon upland habitats where ongoing and expanded mining will occur. We would not be surprised during the long project life if a migrating/dispersing cuckoo occurred briefly within or near the PVM footprint and its behavior was temporarily altered due to mine actions. However, we expect these instances would be infrequent and effects to be temporary. Therefore, we expect ongoing and future PVM ore extraction, development, reclamation, and post-closure activities will have an insignificant and discountable effect to migrant cuckoos, its behavior, and habitat.

There is no reasonable certainty that PVM actions supporting mining and operations, such as noise, light, traffic, and transmission lines/utilities will result in adverse effects to migrating cuckoos or its habitat. PVM's directs ongoing artificial outdoor nighttime lighting down toward the facilities and future expansion will create lighted facilities farther away from Pinto Creek. As a result, we do not anticipate ongoing or future lighting locations to noticeably extend to Pinto Creek and disrupt cuckoos where they are most likely to occur. Noise (mining, vehicles, heavy equipment, human activity, etc.) in excess of 60 decibels will occur at PVM and at a 0.3-mile section of Pinto Creek during tailing facility reclamation (USFS 2020). We expect the distance and sound dampening influence of topography and vegetation will reduce sound levels along Pinto Creek, where cuckoos have occurred with ongoing PVM activities. To our knowledge, cuckoo collision with transmission wires, buildings, and vehicles, or electrocution from utilities have not have been actively sought out or previously recorded at PVM. These supporting activities are present where preferred cuckoo habitat is absent, reducing the likelihood of fatalities or injuries occurring. Therefore, we expect ongoing and future PVM noise, light, traffic, and transmission lines/utilities will have an insignificant and discountable effect to migrant cuckoos, its behavior, and habitat within the action area.

ADEQ (2017) identified PVM, along with eight other mines (only PVM and Carlotta Mine are active) as point sources for Pinto Creek copper pollution (Appendix B, Figure 3). ADEQ (2017) described, "Elevated copper concentrations are expected in a watershed that has had an extensive history of mining as is the case for the Pinto Creek watershed." ADEQ modeled pre-mining Pinto Creek baseline natural copper concentrations and compared those with existing conditions, showing that for both pre-mining and existing conditions, copper concentrations were highest in the upper sections of the stream and diluted by tributary inflow downstream (ADEQ 2016). In the action area, pre-mining baseline copper concentrations ranged from about 26 micrograms/liter (ug/L) down to 10 ug/L (Appendix B, Figure 4). Recent copper concentrations decreased from approximately 82 ug/L at the upper end of the action area to 12 ug/L near the downstream end (Appendix B, Figure 4). ADEQ (2016) identified the Gibson Mine (upstream of the action area), as the largest source of copper to Pinto Creek and future remediation is needed to improve the creek's water quality. Near Gibson Mine and Highway 60, recent copper concentrations were the highest at about 380 ug/L (Appendix B, Figure 4). ADEQ proposed (2016) and adopted (18 Arizona Administrative Code 11, Article 1, Appendix C) a 34 ug/L dissolved copper site-specific standard, which addresses Environmental Protection Agency standards for protection of all designated uses (including aquatic life), and is lower than applicable standards for Full Body Contact, Agriculture Irrigation, and Agriculture Livestock Watering.

We anticipate that ongoing and future PVM mining will contribute contaminants to Pinto Creek, and that further Pinto Creek watershed mine remediation, dynamic water flows, ADEQ regulations/permitting, and PVM monitoring and management will prevent contaminant discharge from causing adverse effects to cuckoos. Literature summaries identify that the effects of elevated copper to bird species are not well studied, yet birds are likely more resilient than fish, and copper does not bio-accumulate like other metals (Eisler 1998). ADEQ's (2019) permit authorizes discharge of stormwater mixed with mine process water and mine drainage from PVM to four unnamed Pinto Creek tributaries/washes (ADEQ 2019). ADEQ (2019) expects PVM to limit copper concentration discharge to a monthly average of 25 ug/L and a daily maximum of 50 ug/L. PVM's ongoing and future discharge into Pinto Creek are expected to contribute to elevated copper levels above the natural baseline, but within a level necessary to protect aquatic life and livestock, and likely any cuckoos using the area. Periodic dynamic high flows may assist in reducing contaminant concentrations, but conversely, elongated drought and/or reduced baseflow can exacerbate contaminant concentration (USFS 2019). Remediation of old inactive mines, such as the Gibson Mine, has reduced copper concentrations in upper Pinto Creek (USFS 2019, 2020). Continued remediation of Gibson and other inactive mines may contribute to reducing local and watershed copper concentrations. ADEQ (2019) also regulates parameters for selenium, sulphates, mercury, metals, etc. These other compounds may also be elevated, but within levels to protect wildlife. We do not have information for breeding cuckoos currently relying on the Pinto Creek action area, and migrant cuckoos are limited in exposure by the relatively short duration they persist within the action area. Therefore, we anticipate ongoing and future PVM mining will continue to discharge contaminants into Pinto Creek, and through ongoing ADEQ regulation, PVM management, and upstream inactive mine remediation, contaminant levels will be will be prevented from adversely affecting migrant or dispersing cuckoos or its habitat.

We expect ongoing and future PVM groundwater extraction from the Peak Well system will adversely affect Pinto Creek cuckoo riparian habitat. Groundwater pumping can reduce the ability of an area to support an abundance of riparian vegetation by lowering groundwater tables and drying riparian areas (USFWS 2002). AGFD and Miller Ecological Consultants' Pinto Creek habitat degradation observations in 2017 and 2018 coincided with Pinto Creek groundwater extraction and modeling results (USFS 2020). Between 2013 and 2018, groundwater modeling estimated there was an 82 percent reduction in Pinto Creek baseflow from PVM operations (USFS 2020). Additional modeling identified in the BA describes future Pinto Creek baseflow will decline a further 10 percent during the period of active mining, for a maximum baseflow reduction of 92 percent from 2012 levels (USFS 2020).. Groundwater and surface water form an interconnected hydrologic system (Megdal *et al.* 2011). The principal effect groundwater pumping activities have to cuckoo habitat is reduction of water in riverine ecosystems and lowering of associated subsurface water tables, therefore removing or reducing the essential component that creates conditions for abundant cuckoo riparian habitat to persist. Without elevated groundwater tables, native woody riparian vegetation such as willow and cottonwood is unable to germinate, grow, and flourish (Stromberg *et al.* 1996). As a result, we can anticipate existing, more deep-rooted vegetation persisting, but a reduction in elevated groundwater, adversely affecting riparian tree germination, regeneration, growth and overall vegetation abundance and density through time. The Forest Service (2020) estimated that PVM groundwater pumping would adversely affect approximately 308 acres of cuckoo habitat.

PVM's ongoing groundwater effects to migratory cuckoos will likely be insignificant due the bird's ability to take advantage of broader quality habitat for cover or to move to other nearby areas for food or cover/shelter. Yet, we anticipate that ongoing and future PVM groundwater extraction over the operational life of the mine will adversely affect the recovery and establishment of cuckoo breeding habitat.

We expect the ongoing and future PVM groundwater extraction from Pinto Creek and subsequent riparian habitat and stream flow simplification (USFS 2020) will have some adverse effect to the quality, availability, abundance, and continuity of cuckoo prey. Typical cuckoo prey is abundant, large insect fauna (e.g., cicadas, caterpillars, katydids, grasshoppers, crickets, large beetles, dragonflies, and moth larvae) and small vertebrates (frogs and lizards) (85 FR 11472). Desiccated riparian sites produce fewer suitable insects than moist sites (85 FR 11472). Reduced aquatic habitat complexity, such as the loss of pools or surface water can reduce the locations, abundance, and overall continuity in prey resources throughout the breeding season. Because cuckoos are large birds with a short hatch-to-fledge time, the adults must have access to abundant food sources to successfully rear their offspring (Laymon 1980), and humidity, soil moisture, and surface water flows are important triggers for insect reproduction and cuckoo nesting (Wallace *et al.* 2013). Because the action area supports migrating cuckoos, we anticipate they will continue to acquire prey within the action area or move to other nearby areas. However, the ongoing and future effect to prey resources over approximately 308 acres of cuckoo habitat will likely be a factor preventing the area from recovering and supporting breeding cuckoos.

Overall, we anticipate the effects to Pinto Creek will not prevent cuckoo recovery within the Tonto Basin area and subsequently across its wide range. The distribution and variety of cuckoo habitat within Tonto Basin consist of larger creeks and rivers, smaller tributaries, lake conservation space, and managed restoration site. This diversity of sites over a broad area encompass an abundance of locations where breeding cuckoos occur and can improve their distribution and abundance.

Effects of the action to western yellow-billed cuckoo proposed critical habitat

We anticipate the ongoing and future groundwater extraction from the PVM Peak Well Field will reduce the Pinto Creek groundwater table and alter surface flow, riparian habitat quality, and cuckoo prey species, adversely affecting approximately 308 acres of proposed cuckoo critical habitat. We have discussed above how we anticipate the ongoing and future effects of the proposed action will adversely affect cuckoo habitat, which corresponds to the cuckoo proposed critical habitat PBFs. We anticipate groundwater extraction to adversely affect and reduce the Pinto Creek groundwater table and surface water (PBF 3 – hydrologic processes to maintain and regenerate habitat). Groundwater extraction will adversely affect the amount and quality of riparian woodlands (PBF 1 - riparian woodlands). Through the drying of Pinto Creek riparian habitat and simplification and alteration of stream habitat, we anticipate a reduction in the quality, distribution, continuity, and abundance of insect, amphibian, and reptile cuckoo prey (PBF 2 – adequate prey base).

We expect PVM effects to Pinto Creek cuckoo proposed critical habitat will not preclude recovery. The effects to 308 acres of proposed Pinto Creek critical habitat represent 0.06 percent of the overall 493,665 acres proposed across the bird's breeding range. Within Tonto Basin, Pinto Creek is a smaller tributary and represents 4.3 percent of proposed critical habitat on Pinto (373 acres), Pinal (419 acres), and Tonto Creeks (3,669 acres) and the Salt River (2,590 acres). Therefore, we have not reached a tipping point where the effects of this action on proposed critical habitat will preclude its conservation role for recovery.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area considered in this biological opinion (50 CFR 402.02).

Climate change, in combination with drought cycles, is likely to exacerbate existing threats to cuckoo habitat in the southwestern U.S., now and into the near future (85 FR 11475). Increased and prolonged drought associated with changing climatic patterns will adversely affect streams and riparian habitat by reducing water availability and altering food availability. The continued warming and drying of habitat will likely alter vegetation structure and composition and reduce the amount and quality of cuckoo habitat.

Because the TNF surrounds private mining lands and mining areas are largely restricted from public use and hold essential federal permits necessary for ongoing operations, there are likely few non-federal actions occurring in the action area or immediate surrounding area affecting the action area. We anticipate some recreational hiking, birding, and camping in the general area could temporarily disrupt bird behavior, but we do not anticipate high recreational use that could result in nest failure. The TNF (2020) identified that continued groundwater withdrawals in the Pinto Creek watershed, under existing water rights, may cause less water availability and associated effects to riparian habitat.

JEOPARDY AND ADVERSE MODIFICATION ANALYSIS

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

Jeopardy Analysis Framework

Our jeopardy analysis relies on the following:

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components:

1) Status of the Species, which evaluates the range-wide condition of the listed species, the factors responsible for that condition, and the species' survival and recovery needs;
2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species;
3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and,
4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species.

The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for making the jeopardy determination.

Destruction/Adverse Modification Analysis Framework

The final rule revising the regulatory definition of "destruction or adverse modification of critical habitat" became effective on March 14, 2016 (81 FR 7214). The revised definition states: "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.

Similar to our jeopardy analysis, our adverse modification analysis of critical habitat relies on the following four components:

1) The Status of Critical Habitat, which evaluates the range-wide condition of designated critical habitat in terms of PCEs, the factors responsible for that condition, and the intended recovery function of the critical habitat overall;
2) The Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area;
3) The Effects of the Action, which determine the direct and indirect effects of the proposed federal action and the effects of any interrelated or interdependent activities on the PCEs and how they will influence the recovery role of affected critical habitat units; and,
4) Cumulative Effects, which evaluate the effects of future, non-federal activities in the action area on the PCEs and how they will influence the recovery role of affected critical habitat units.

Conclusion

After reviewing the current status of the western yellow-billed cuckoo and its proposed critical habitat, the environmental baseline for the action area, the effects of the action, as proposed, and

the cumulative effects, it is our biological and conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the cuckoo, and is not likely to destroy or adversely modify proposed critical habitat.

We base this conclusion on the following:

- There are no known breeding cuckoos within the action area. We expect migrating and dispersing cuckoos can and will continue to use Pinto Creek within the action area for foraging, cover and shelter. We do not anticipate any fatalities, injuries, or other harm or harassment to individual migrating or dispersing cuckoos from the proposed action. Therefore, we anticipate no incidental take of cuckoos from the proposed action.
- The ongoing and future proposed action will diminish the quality of approximately 308 acres of proposed cuckoo critical habitat for cuckoo conservation, but the proportion of the entire proposed designation affected is small. The adverse effects to proposed critical habitat are a small fraction (0.06 %) of the total 493,665 acres of proposed critical habitat across Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah.
- The ongoing and future proposed action at Pinto Creek will affect 4.3 percent (308 acres) of the proposed cuckoo critical habitat in Tonto Basin (7,051 acres). Proposed critical habitat also occurs along the Salt River, and Tonto and Pinal Creeks. Breeding cuckoos occur on Rye, Cucamonga, Tonto and Cherry creeks; the Rockhouse Demonstration Site; Salt River; and the Rockhouse Demonstration Site within Tonto Basin.
- Based upon the distribution of breeding cuckoos across Tonto Basin and the small proportion of proposed critical habitat affected within Tonto Basin and across the cuckoo's range, we do not expect PVM's effects to Pinto Creek will reach a tipping point, preventing the bird's recovery or appreciably diminishing the conservation role of proposed critical habitat.

We based the conclusions of this biological opinion on full implementation of the project as presented in the Description of the Proposed Action section of this document.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

We do not anticipate the proposed action will incidentally take any western yellow-billed cuckoos.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1) We recommend continued coordination with the TNF and FWS and sharing of information about listed species survey results, changes to the proposed action, effects different from what we evaluated and anticipated, and listings to identify further conservation or consultation needs.
2) We recommend continued and enhanced cuckoo surveys to aid its detection, management, and recovery on the TNF.
3) We recommend implementation of conservation actions to improve Pinto Creek groundwater and surface water to aid in riparian habitat improvement and cuckoo recovery.

REINITIATION NOTICE

This concludes formal consultation and the conference opinion for PVM Expansion and Operation in Gila County, AZ. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if we designate the proposed critical habitat. The request must be in writing. If we review the proposed action and find there have been no significant changes in the action as planned or in the information used during the conference, we will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying the Hopi Tribe, Fort McDowell Yavapai Nation, Salt River Pima Maricopa Indian Community, Gila River Indian

Community, and San Carlos and White Mountain Apache Nations of its completion. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

We appreciate the TNF's efforts to identify and minimize effects to listed species from this project. Please refer to the consultation number, 02EAAZ00-2020-F-0490 in future correspondence concerning this project. Should you require further assistance or if you have any questions, please contact Greg Beatty (602-242-0210).

Sincerely,

Jeffrey A. Humphrey
Field Supervisor

cc (electronic):

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Mesa, AZ
Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, Tucson and Phoenix, AZ (Attn: K. Robertson, S. Sferra, and E. Fernandez)
Supervisors Office, Tonto National Forest, Phoenix, AZ (Attn. M. Martinez, D. Ulberg, M. Taylor)
District Ranger, Globe Ranger District, Tonto National Forest, Globe, AZ
Director, Hopi Cultural Preservation Office, Kykotsmovi, AZ
Cultural Resources Department, Salt River Pima Maricopa Indian Community, Scottsdale, AZ (Attn. K. Washington)
Natural Resource Division, Salt River Pima Maricopa Indian Community, Scottsdale, AZ (Attn. C. Horan, R, Leverette)
Environmental Director, Fort McDowell Yavapai Nation, Fort McDowell, AZ (Attn. M. Frank)
Cultural Resources Program, Gila River Indian Community, Sacaton, AZ (Attn. B. Lewis)
Environmental Quality Program, Gila River Indian Community, Sacaton, AZ (Attn. W. Antone III)
Recreation and Wildlife Director, San Carlos Apache Nation, San Carlos, AZ (Attn. T. Stevens)
Historic Preservation Department, San Carlos Apache Nation, San Carlos, AZ (Attn. V. Grant)
Director, Game and Fish Department, White Mountain Apache Nation, Whiteriver, AZ (Attn. S. Leon)
Cultural Resources, White Mountain Apache Nation, Whiteriver, AZ (Attn. R. Riley)
Environmental Protection Officer, Bureau of Indian Affairs, Phoenix, AZ (Attn. C. Lewis)

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LITERATURE CITED

General

U.S. Forest Service (USFS). 2019. Pinto Valley Mine Draft Environmental Impact Statement. December 13, 2019.

_____ 2020. Pinto Valley Mine Environmental Impact Statement Biological Assessment, Globe Ranger District, Tonto National Forest, April 2020.

Western Yellow-billed Cuckoo

Arizona Department of Environmental Quality (ADEQ). 2016. Pinto Creek Site-Specific Water Quality Standard for Dissolved Copper, Salt River Watershed – HUC# 15060103-018. Open File Report 16-04. Arizona Department of Environmental Quality, Phoenix, AZ.

_____. 2017. Pinto Creek Dissolved Copper TMDL, Salt River Watershed. Open File Report 16-05. Arizona Department of Environmental Quality, Phoenix, AZ.

_____. 2019. ADEQ Permit to Discharge Under the Arizona Pollutant Discharge Elimination System. Permit # AZ0020401 issued to Pinto Valley Mine Corp. October 7, 2019, Arizona Department of Environmental Quality, Phoenix, AZ

American Ornithologists' Union. 1998. Checklist of North American birds. 7th ed. Washington, D.C.

Arizona Game and Fish Department (AGFD). 2015. Arizona cuckoo records. Heritage Data Management System, Phoenix.

Brown, D.E. 1994. Biotic communities of the southwestern United States and northwestern Mexico. University of Utah Press, Salt Lake City.

Carstensen, D., D. Ahlers, and D. Moore. 2015. Yellow-billed cuckoo study results–2014, Middle Rio Grande from Los Lunas to Elephant Butte Reservoir, New Mexico. Prepared for Albuquerque Area Office, U.S. Bureau of Reclamation, Albuquerque, New Mexico. Technical Service Center, Fisheries and Wildlife Resources Group, Denver, Colorado.

Corman, T.E., and R.T. Magill. 2000. Western yellow-billed cuckoo in Arizona: 1998 and 1999 survey report to the Nongame and Endangered Wildlife Program, Arizona Game and Fish Department. Technical Report 150. Phoenix.

Corman, T.E., and C. Wise-Gervais. 2005. Arizona breeding bird atlas. University of New Mexico Press, Albuquerque.

Cornell Lab of Ornithology. 2015. -bird web site. http://ebird.org/content/ebird/about/

Ehrlich P.R., D.S. Dobkin, and D. Wheye. 992. Birds in jeopardy. Stanford University Press, Stanford, California.

Eisler, R. 1998. Copper hazards to fish, wildlife, and invertebrates: a synoptic review. U.S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR--1998-0002.

Gaines, D. and S.A. Laymon. 1984. Decline, status, and preservation of the yellow-billed cuckoo in California. Western Birds 15:49–80.

Halterman, M.M. 2009. Sexual dimorphism, detection probability, home range, and parental care in the yellow-billed cuckoo. Ph.D. Dissertation, University of Nevada, Reno.

Halterman, M., M.J. Johnson, J.A. Holmes and S.A. Laymon. 2015. A natural history summary and survey protocol for the Western Distinct Population Segment of the yellow-billed cuckoo: U.S. Fish and Wildlife Techniques and Methods, Final Draft.

Hamilton, W.J. III, and M.E. Hamilton. 1965. Breeding characteristics of yellow-billed cuckoos in Arizona. Proceedings California Academy of Sciences, 4th Series, 32:405–432.

Hughes, J. M. 1999. Yellow-billed cuckoo (*Coccyzus americanus*). In A. Poole and F. Gills, eds. The Birds of North America, no. 418. The Birds of North America, Inc, Philadelphia, Pennsylvania.

Jacobs Engineering Group. 2019b. Yellow-billed cuckoo survey report for the proposed Verde Connect. Prepared for Yavapai County and Federal Highway Administration. Phoenix Arizona.

Johnson, M.J., S.L. Durst, C.M. Calvo, L. Stewart, M.K. Sogge, G. Bland, and T. Arundel. 2008. Yellow-billed cuckoo distribution, abundance, and habitat use along the lower Colorado River and its tributaries, 2007 annual report. U.S.Geological Survey Open-file Rep 2008–1177.

Laymon, S.A. 1980. Feeding and nesting behavior of the yellow-billed cuckoo in the Sacramento Valley. California Dept. of Fish and Game, Wildlife Management Branch, Sacramento, CA, Admin Rep. 80–2.

Laymon, S.A., and M.D. Halterman. 1987. Distribution and status of the yellow billed cuckoo in California. Final report to the California Department of Fish and Game, Contract #C 1845, Sacramento.

_____. 1989. A proposed habitat management plan for yellow-billed cuckoos in California. U.S. Department of Agriculture, Forest Service, Gen. Tech. Rep. PSW-110: 272-277.

Laymon, S.A. and P.L. Williams. 2002. Breeding status of the yellow-billed cuckoo in the South Fork Kern River Valley, Kern County, California: field season 2001. USDA Forest Service, Sequoia National Forest, Cannell Meadow Ranger District, Kernville, California.

Laymon, S.A., P.L. Williams, and M.D. Halterman. 1993. Monitoring of riparian habitat restoration sites: breeding birds and habitat characteristics, 1992, and yellow-billed cuckoo study, 1992. Admin. Rep. The Nature Conservancy, Kern River Preserve, #CARO 060894, and California Department of Fish and Game #FG1496.

_____. 1997. Breeding status of the yellow-billed cuckoo in the South Fork Kern River Valley, Kern County, California: summary report 1985–1996. Admin. Rep. USDA Forest service, Sequoia National Forest, Cannell Meadow Ranger District, Challenge Cost-Share Grant #92–5–13.

McGill, R.R. 1975. Land use changes in the Sacramento River riparian zone, Redding to Colusa. State of California Water Resources, Sacramento.

McNeil, S.E., D. Tracy, J.R. Stanek, J.E. Stanek, and M.D. Halterman. 2011. Yellow-billed cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2010 annual report. Lower Colorado River Multi-species Conservation Program, U.S. Bureau of Reclamation, Boulder City, Nevada.

McNeil, S.E., D. Tracy, J.R. Stanek, and J.E. Stanek. 2012. Yellow-billed cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2011 annual report. Lower Colorado River Multi-species Conservation Program, U.S. Bureau of Reclamation, Boulder City, Nevada.

McNeil, S.E., D. Tracy, J.R. Stanek, and J.E. Stanek. 2013. Yellow-billed cuckoo distribution, abundance and habitat use on the lower Colorado River and tributaries, 2008–2012 summary report. Lower Colorado River Multi-Species Conservation Program, U.S. Bureau of Reclamation, Boulder City, Nevada.

Megdal, S., J. Nadeau, and T. Tom. 2011. The Forgotten Sector: Arizona Water Law and the Environment. Arizona Journal of Environmental Law and Policy, Vol. 1. No. 2.

Phillips, A., J. Marshall, and G. Monson. 1964. The birds of Arizona. University of Arizona Press, Tucson.

Poff, N.L., J.D. Allan, M.B. Bain, J.R. Karr, K.L. Prestegaard, B.D. Richter, R.E. Sparks, and J.C. Stromberg. 1997. The natural flow regime: a paradigm for river conservation and restoration. BioScience 47:769–784.

Sechrist, J., V. Johanson, and D. Ahlers. 2009. Western yellow-billed cuckoo radio telemetry study results middle Rio Grande, New Mexico: 2007–2008. U.S. Bureau of Reclamation, Technical Services Center, Denver, Colorado.

Sechrist, J.D., D.D. Ahlers, K. Potak Zehfuss, R.H. Doster, E.H. Paxton, and V.M. Ryan. 2013. Home range and use of habitat of western yellow-billed cuckoos on the Middle Rio Grande, New Mexico. Southwestern Naturalist 58(4):411-419.

Sferra, S. 2004 Southwestern willow flycatcher survey form. U.S. Bureau of Reclamation, Phoenix Area Office, Phoenix, AZ

Stromberg, J.C., R. Tiller and B. Richter. 1996. Effects of Groundwater Decline on Riparian Vegetation of Semiarid Regions: The San Pedro, Arizona. Ecological Applications, Vol. 6, No. 1 (Feb., 1996), pp. 113-131.

Thompson, K. 1961. Riparian forests of the Sacramento Valley, California. Annals of the Association of American Geographers 51:294–315.

U.S. Fish and Wildlife Service (USFWS). 2002. Southwestern willow flycatcher recovery plan. Southwestern Region, U.S. Fish and Wildlife Service, Albuquerque, NM.

_____. 2015. Draft AZ Western Yellow-billed Cuckoo consultation guidance 03/16/15. Arizona Ecological Services Office, Phoenix.

Wallace, C.S.A., M.L. Villarreal, and C. van Riper, III. 2013. Influence of monsoon-related riparian phenology on yellow-billed cuckoo habitat selection in Arizona. Journal of Biogeography, 40, 2094–2107

Wilcove, D.S., C.H. McLellan, and A.P. Dobson. 1986. Habitat fragmentation in the temperate zone. Pp. 237–256, in Conservation Biology: Science of Scarcity and Diversity. M. Soulé ed., Sinauer Associates, Sunderland, Massachusetts.

APPENDIX A - CONCURRENCES

This appendix contains our concurrences with your "may affect, but is not likely to adversely affect" determinations for the endangered southwestern willow flycatcher (*Empidonax traillii extimus*: flycatcher), ocelot *(Leopardus pardalis*), and Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*).

Arizona Hedgehog Cactus

Conservation Measures

- Prior to conducting surface-disturbing activities, PVM will survey all undisturbed areas within the construction footprint that contain potential Arizona hedgehog cactus habitat that have not been previously surveyed and are not within active mining areas. If PVM finds any Arizona hedgehog cactus during such surveys, PVM will protect the cactus in place.
- If PVM cannot permanently protect the Arizona hedgehog cactus in place, PVM would coordinate with the FWS regarding requirements for compliance with the Act.

Effects Determination

- Because the PVM action area occurs outside predicted Arizona hedgehog cactus habitat and because no Arizona hedgehog cacti have been located during 2008 to 2016 surveys (USFS 2020), we anticipate the Arizona hedgehog cacti is unlikely to occur within proposed disturbance areas and is not likely adversely affected.
- Because the closest known Arizona hedgehog population is approximately 1.3 miles from the nearest sources of dust, we anticipate no effects from dust deposition.

Ocelot

Other than a single ocelot occurrence in 2010 on the Globe Ranger District, TNF, no other recent central Arizona ocelot records exist. It is currently approximately 100 miles to known contemporary ocelot records in southern Arizona, and approximately 170 miles to the nearest known breeding population in Mexico (USFS 2020).

Effects determination

- Due to the scarcity of ocelot occurrence in central Arizona and the long distance to areas where ocelots are less scarce in Arizona and known to be reproducing in Mexico, we expect ocelots are not likely to occur in the project area and therefore any effects from the proposed action will be discountable.

Southwestern willow flycatcher

Surveyors, including AGFD, Bureau of Reclamation, TNF, and Westland Resources have searched Pinto Creek for southwestern willow flycatchers periodically from 1993 to 2017,

without detecting any flycatchers. Because of the relatively close proximity and large flycatcher breeding population at nearby Roosevelt Lake, it would not be unexpected for migrating or dispersing flycatchers to occur along Pinto Creek, but to date, none have yet to be detected during formal surveys.

Effects determination

- Because of the long survey history and lack of breeding flycatcher detections along Pinto Creek, we do not anticipate the proposed action will cause any effects to breeding flycatchers.

- We expect any reduction in riparian habitat quality along Pinto Creek will be an insignificant effect to migrating flycatchers because of their ability to move freely and take advantage of a wider diversity and quality of habitat.

- We would not be surprised during the long project life that a migrating/dispersing flycatcher would perch briefly within or near the PVM footprint and its behavior altered temporarily by mine actions. However, we expect these instances will be infrequent and any effect temporary. Therefore, we anticipate ongoing and future PVM ore extraction, development, reclamation, and post-closure activities will have an insignificant and discountable effect to migrant flycatchers.

- Managers, surveyors, or biologists rarely detect flycatcher collisions with wires, vehicles, buildings, or electrocutions, and as a result, we expect they do not commonly occur. We expect, based upon this rarity of occurrence and the project footprint's lack of flycatcher-preferred habitat, the likelihood of fatalities or injuries from wires, vehicles, buildings, or utilities is discountable.

- We anticipate noise or light from PVM will have an insignificant effect to migrating or dispersing flycatchers along Pinto Creek because of the minimizing effect from distance, vegetation, and topography.

APPENDIX B – FIGURES AND TABLES

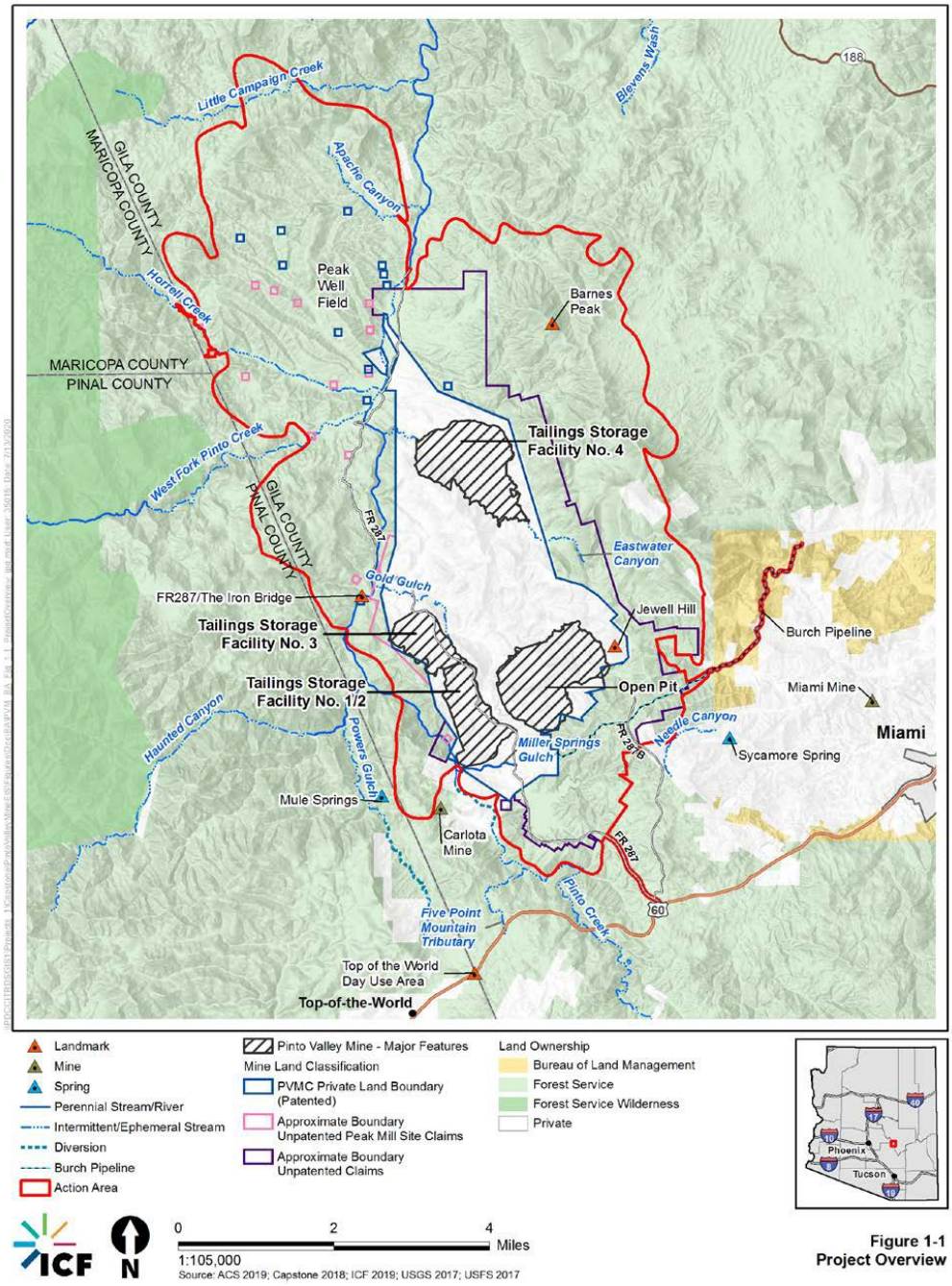

Figure 1. Pinto Valley Mine Project Map Overview, Gila County, Arizona (USFS 2020).

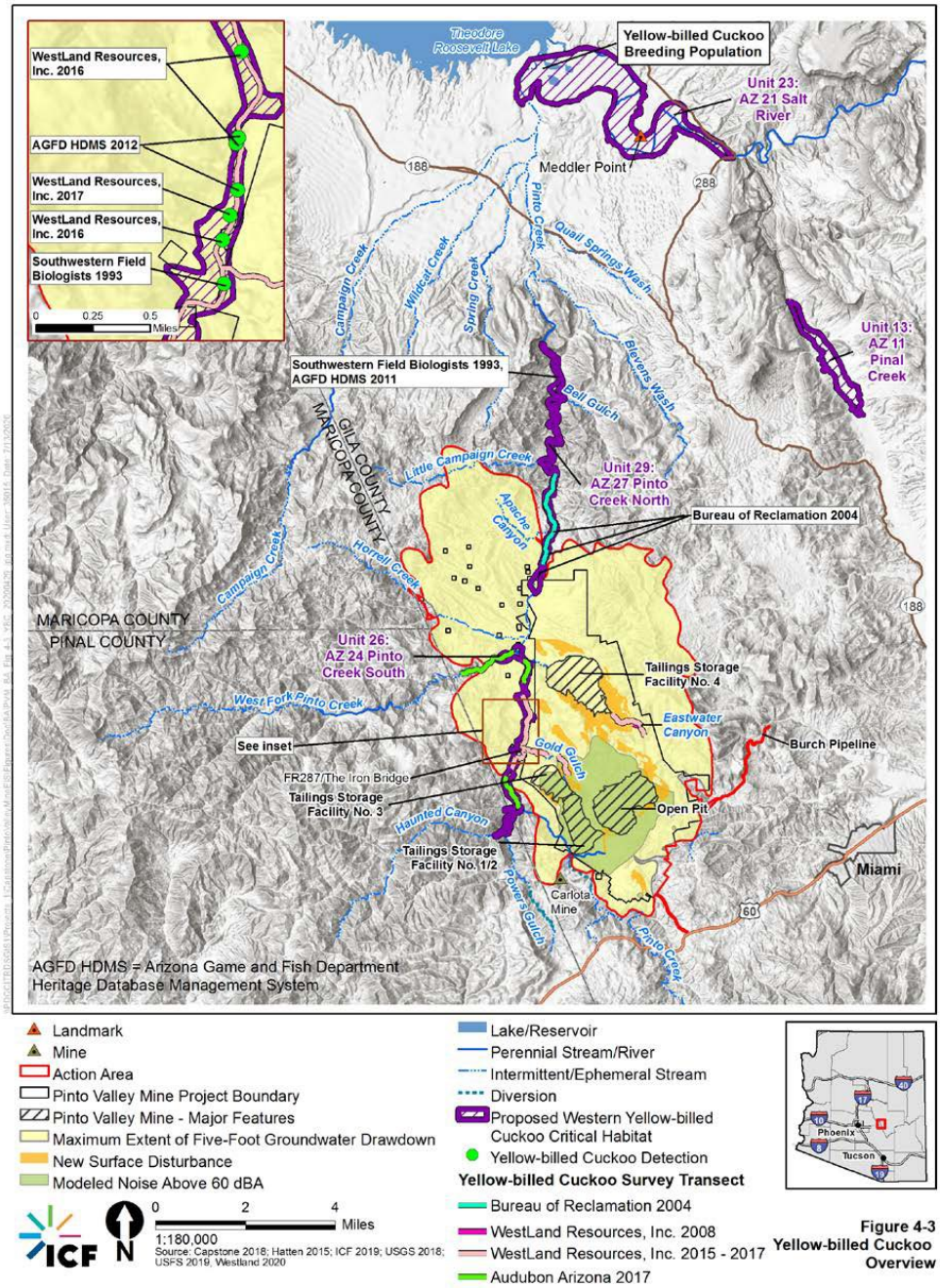

Figure 2. Western Yellow Billed Cuckoo Surveys and Detections, Pinto Valley Mine Overview, Gila County, Arizona (USFS 2020).

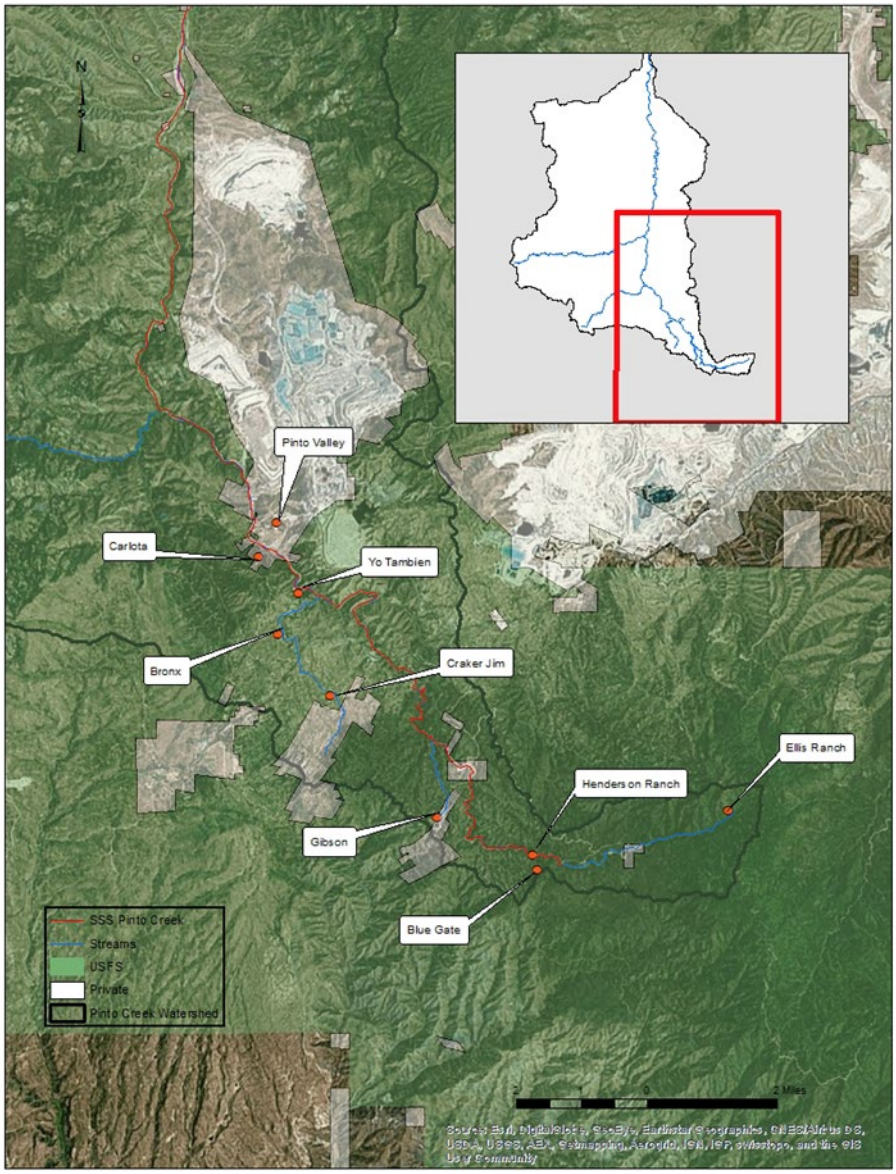

Figure 3. Active and Inactive Mines along Pinto Creek, Gila County, Arizona (ADEQ 2016).

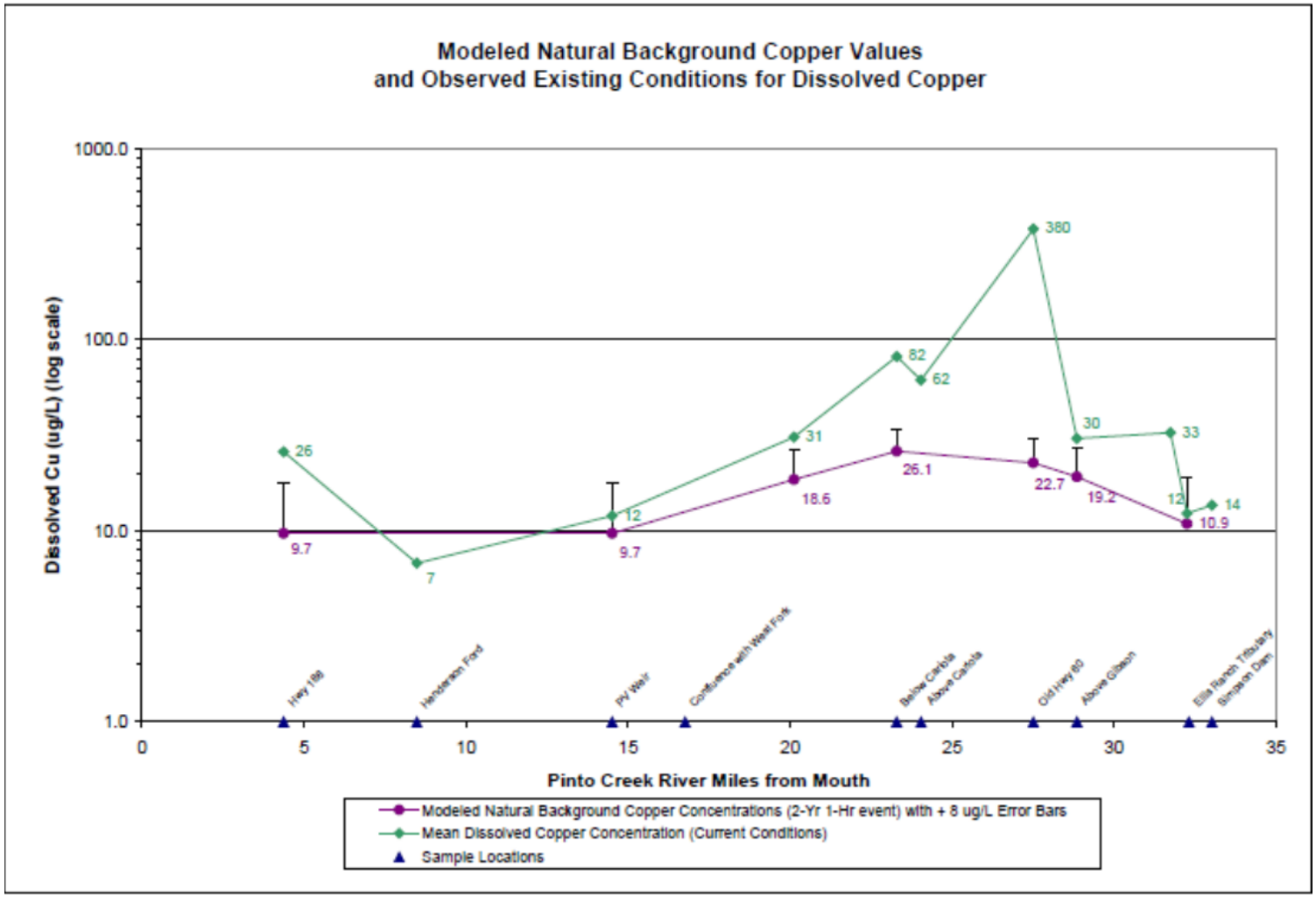

Figure 4. Natural background versus observed existing dissolved copper, Pinto Creek, Gila County, Arizona (ADEQ 2016).

Table 1. Estimated Surface Disturbance for Pinto Valley Mine, Gila County, Arizona.

	Approximate Existing Footprint			Approximate Additional Footprint			Approximate Final Footprint		
Facility	Private	National Forest System	Total	Private	National Forest System	Total	Private	National Forest System	Total
Open Pit	745.8	8.5	754.3	218.9	18.9	237.8	964.7	27.4	992.1
Borrow and Riprap Sources	22.2	0.0	22.2	708.9	170.9	879.8	731.1	170.9	902.0
Main Dump and Other Waste Rock Dumps	273.9	75.7	349.6	675.5	0.0	846.5	949.4	75.7	1025.1
Mill and Concentrator	151.5	13.1	164.6	0.0	0.0	0.0	151.5	13.1	164.6
Cottonwood Tailings Impoundment	43.8	278.2	322.0	0.0	0.0	0.0	43.8	278.2	322.0
Tailings Storage Facilities No. 1 and 2	403.8	0.0	403.8	0.0	0.0	0.0	403.8	0.0	403.8
Tailings Storage Facility No. 3	263.8	5.7	269.5	21.1	21.5	42.6	284.9	27.2	312.1
Tailings Storage Facility No.4	703.9	0.0	703.9	406.2	102.0	508.2	1110.1	102.0	1212.1
Leach Piles, Pregnant Leach Solution Ponds, and Solve Extraction and Electro-winning Plant	689.4	0.0	689.4	-59.6	0.0	-59.6	629.8	0.0	629.8
Roads	20.9	124.3	145.3	2.6	7.3	9.9	23.5	131.6	155.1
Electrical Power Lines	36.8	20.2	57.0	-7.0	-0.8	-7.8	29.8	19.4	49.2
Water Supply, Distribution, Use, and Treatment	86.0	71.7	157.7	-13.1	-1.9	-15.0	72.9	69.8	142.7
All Mine Facilities	3349.2	556.0	3915.2	1087.1	229.4	1316.5	4436.3	795.4	5231.7

Notes: The sum of individual facility disturbance acreages does not equal subtotals or totals shown in the table due to overlapping disturbance among various features. Negative numbers indicate acres of existing disturbance that other facilities would reclaim or subsume.

Table 2. Previous Pinto Valley Mine Authorized Rights-of-Way, Plans of Operation, and Special Use Permits from the Tonto National Forest, Gila County, Arizona.

Permit Number	Facility	Original Authorized Activities
PHX-080742	Cottonwood Tailings Impoundment, Cottonwood Reservoir, and a portion of 19 Dump	Originally construction, operation, and maintenance of a tailings dam and reservoir; tailings pipeline and return water pipeline in 20-foot-wide right-of-way; amended to include a portion of a mining waste dump (19 Dump, the balance of which is authorized by plan of operations POO-0003)
PHX-080933	Water Pipeline and Mine Reservoir	Construction, operation, and maintenance of a water pipeline in 20-foot-wide right-of-way and 2.32-acre water storage reservoir
POO-0001	Tailing Storage Facility No. 3	Tailings impoundment expansion on to two unpatented claims (one of which is also covered by POO-0002)
POO-0002	Tailings Storage Facility No. 3	Construction of new access roads and improvement of an existing National Forest System road to 25 feet wide, water pipeline, and electric cables along edge of roads on four unpatented claims (one of which is also used by POO-0001)
POO-0003	19 Dump	Waste rock dump, a portion of which is authorized by the amended right-of-way PHX-080742
GLO-445301	Pinto Valley Mine sign	Use and maintenance of a non-illuminated company identification sign
GLO-445302	Electric power lines and access roads for operation of wells on Peak mill site claims, and the Burch pipeline booster station	Operation and maintenance of 13.8-kilovolt electrical transmission lines along 20-foot-wide corridors; use and maintenance of National Forest System roads for access
GLO-445303	Water pipelines and access roads from the Pinto Valley Mine to BHP Copper Cities and for wells on Peak mill site claims to the Pinto Valley Mine	Operation and maintenance of the Burch 4-, 12-, and 16-inch diameter pipelines along 8.19 miles of 20-foot-wide corridors, originally totaling 19.85 acres; use of a booster station in a 50-foot-wide portion of the corridor; use and maintenance of temporary access roads for access within same corridor
Tonto 468	Peak Well 37	100-by-100-foot water well site, and 650 feet of access road for pipeline and power line, and vehicular access