Appendix B

- Technical Memorandum #2 - Environmental Overview, June 2011

Corridor Feasibility Study

Hidden Waters Parkway North: Interstate 10 to State Route 74

Project Number TT005

Technical Memorandum No. 2: Environmental Overview

Prepared For:

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In association with:

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I. Introduction

The Hidden Waters Parkway North Corridor Feasibility Study is located west of the Phoenix metropolitan area in Maricopa County, Arizona (Figures 1 and 2). The area west of the White Tank Mountains within the Hassayampa River Valley has been identified as an area where intense growth is anticipated to occur in the next 30 to 50 years. The study area includes the northern section of the Hidden Waters Parkway, as shown on the I-10/Hassayampa Valley Transportation Framework Study (Hassayampa Framework Study), from Interstate 10 (I-10) north to the future alignment of State Route 74 (SR 74). The study area is approximately 28 miles long and two miles wide with two exceptions: in the area from Northern Avenue to Bell Road the study area expands to two miles west of the alignment and the area from the south end of Douglas Ranch to Patton Road the study area expands to two miles east of the alignment. In these two areas, the study area is three miles wide (Figure 2).

Currently, there is very little development within the study area, with these areas concentrated in the northern and in the southern ends. Several master-planned communities are in the planning stages within this area, and at build-out, it is estimated that approximately 150,000 dwelling units will be constructed (Maricopa Association of Governments [MAG] 2007). To address this anticipated growth, MAG prepared the Hassayampa Valley Framework Study, which recommends a roadway network consisting of freeways, parkways, and major arterial roadways to meet the future traffic demands within northwest Maricopa County. The Hidden Waters Parkway North Corridor Feasibility Study was commissioned by Maricopa County Department of Transportation (MCDOT) in response to this anticipated growth and the future need for a high-capacity parkway within this corridor.

The purpose of this corridor feasibility study is to identify potential fatal flaws and develop an alignment alternative that meets the future traffic needs of the area. Several technical memoranda are being prepared in support of the corridor feasibility study including Technical Memorandum No. 1, Existing and Future Corridor Features, Memorandum No. 2, Environmental Overview, and Technical Memorandum No. 3 Drainage Overview. The environmental overview describes the study area in terms of its cultural, natural, socioeconomic, and physical resource contexts and identifies potential environmental concerns for future MCDOT long-term transportation needs in this area. The information presented is based on existing data sources from municipal, county, state, and federal agencies and on a “windshield” survey of the study area where accessible by roads. It documents the known environment within the study area but is not intended to meet the requirements of the National Environmental Policy Act of 1969 (NEPA) (40 Code of Federal Regulation [CFR] § 1500). A separate NEPA evaluation will be prepared later in the pre-design process.

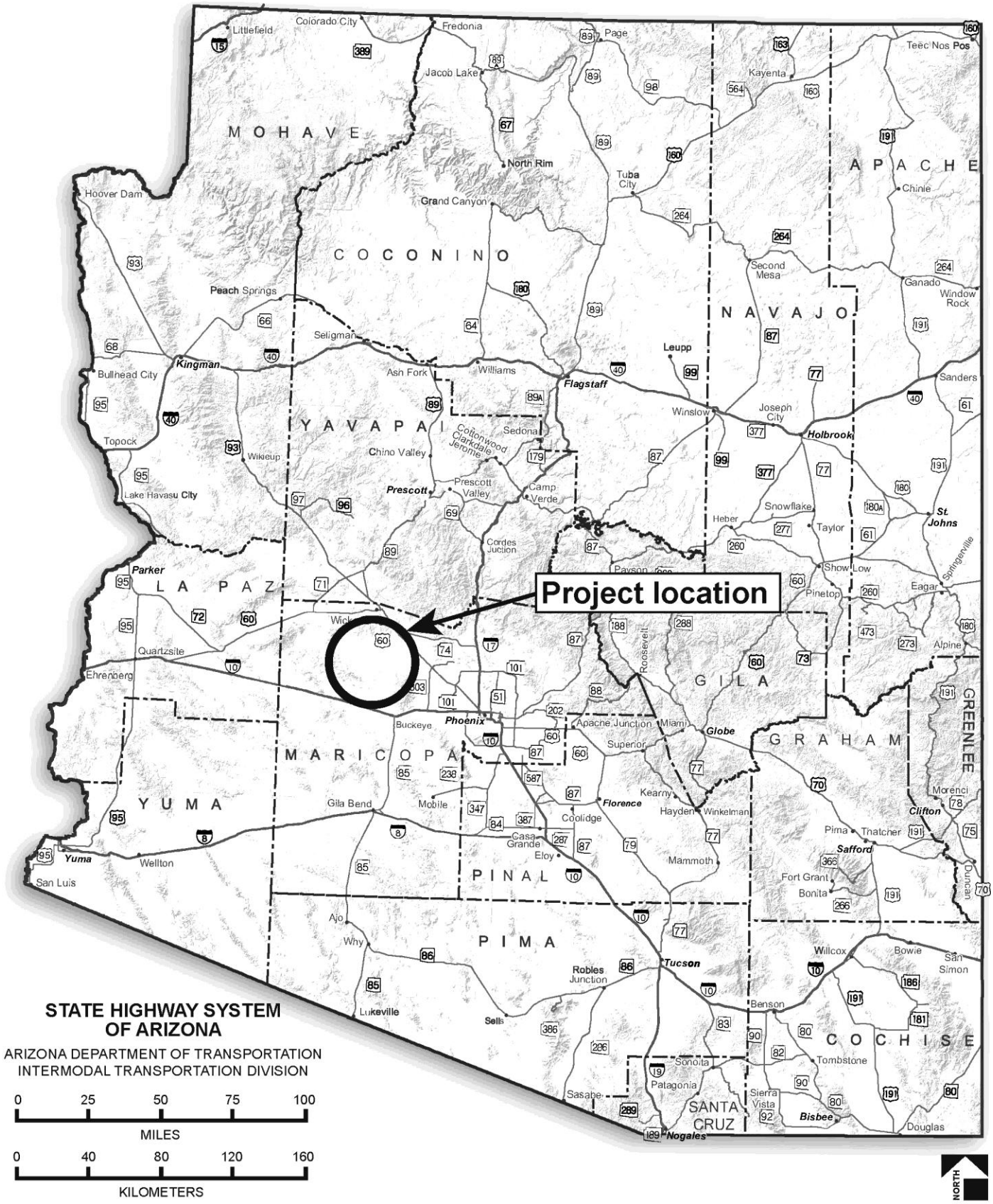
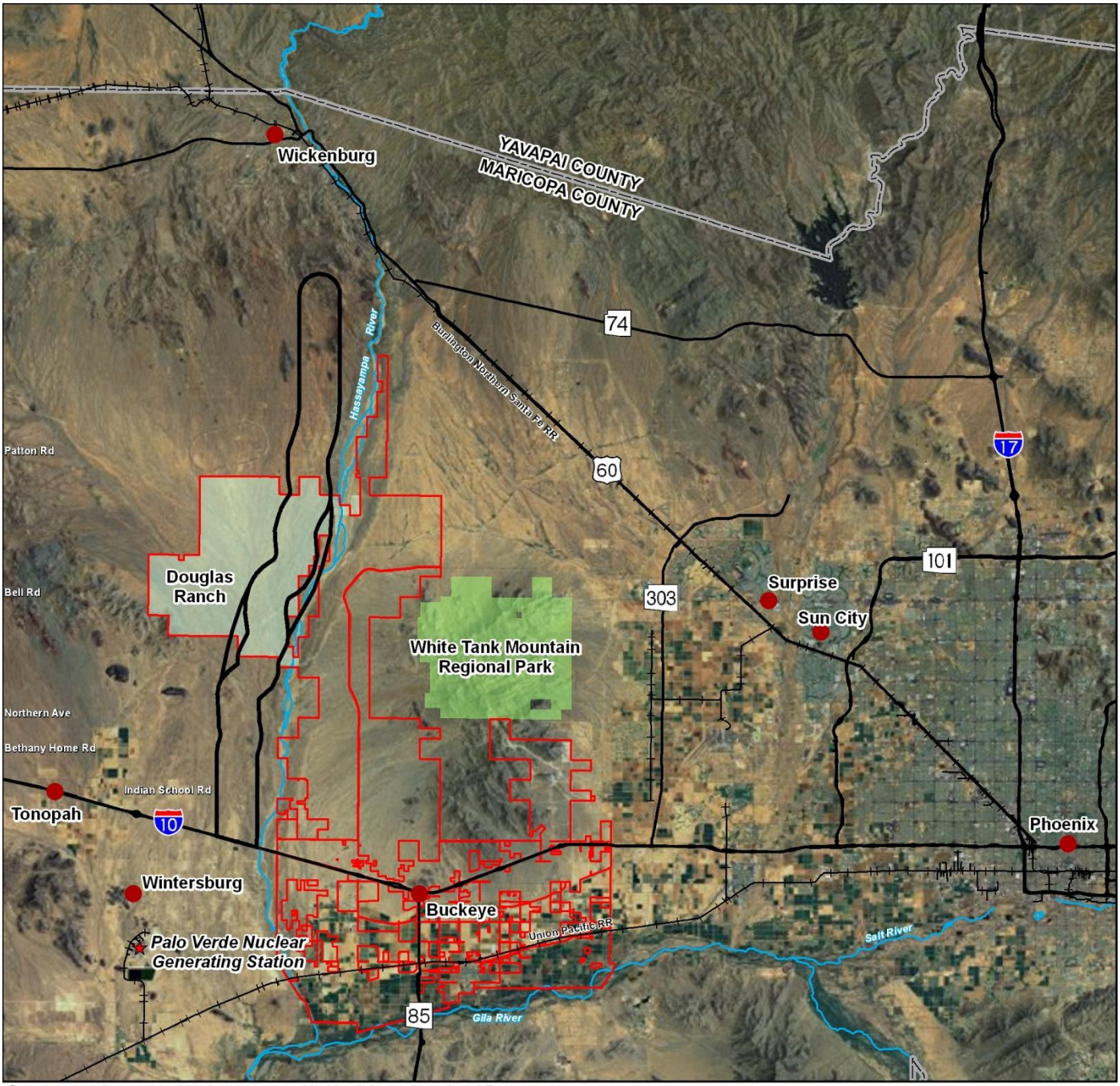


Figure 1. State location



Source: Land Ownership GIS Coverage provided by Arizona State Land Department; Arizona Transportation Information System GIS Coverage (2007)

Key

- Study Area
- Roads
- Railroad
- Rivers
- Douglas Ranch
- Buckeye Town Limits
- Parks and Recreation

Miles

0 10

NORTH

Figure 2. Study area location

II. Cultural Resources

Multiple federal, state, and local laws address the consideration of cultural resources in planning and development projects. Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 United States Code [USC] § 470 et seq.) requires that projects identified as federal undertakings be evaluated for their impacts on historic properties. Title 36 CFR § 800 provides implementing regulations for Section 106 of the NHPA and defines a process of consultation that federal agencies follow to evaluate impacts on identified historic properties.

Other federal legislation, including the Archaeological Resources Protection Act of 1979 (16 USC §§ 470 aa–mm), the Native American Graves Protection and Repatriation Act of 1990 (25 USC §§ 3001–3013), the American Indian Religious Freedom Act (42 USC §§ 1996 and 1996a), and Section 4(f) of the Department of Transportation Act of 1966 (23 USC § 138), has also been enacted to ensure the proper treatment of cultural resources for projects that occur on federal lands, are funded by federal monies, or require a federally issued permit. Section 4(f) of the Transportation Act has a particular bearing on undertakings funded by the Federal Highway Administration (FHWA), as it provides that Department of Transportation agencies cannot approve the use of land that creates potential impacts on historic properties.

On a state level, Arizona Revised Statutes §§ 41-841 through 41-847 and §§ 41-861 through 41-881 have been enacted to protect cultural resources and burials and associated grave goods for undertakings on nonfederal lands in Arizona. The Arizona State Historic Preservation Act of 1982 further directs state agencies to consider impacts of their undertakings on historic properties.

A. Cultural Context

Culturally, the study area lies at the fringe of the territory occupied by the Hohokam during the Formative period, generally after the start of the Colonial period, around A.D. 750. The Hohokam are known for their complex canal systems, architecture, and ceramic styles. Hohokam architecture began as belowground pit structures and transitioned into aboveground adobe-walled compounds with numerous interior structures. The Hohokam culture, often described as a regional system of linked economics and beliefs (Wilcox 1979), collapsed around A.D. 1450.

The area immediately to the west of the study area was occupied by prehistoric Yuman (Patayan) groups. Yuman diet was characterized by a mixed subsistence strategy of seasonal floodwater cultivation of maize, squash, and beans and the supplemental collection of mesquite pods, along with saguaro and other desert plants obtained from interior desert areas (Castetter and Bell 1951; McGuire 1982:220–221; Rogers 1945; Schroeder 1979). Land-use features associated with the Patayan include geoglyphs (intaglios), petrogylphs, trail systems, rock cairns, modified desert-pavement surfaces (“sleeping circles”), and ground-stone quarries and manufacturing sites.

After prehistoric occupation, the area became home to historic populations of Yavapai. The Yavapai were organized into extended families who seasonally camped together to exploit particular food resources. At certain times of the year, multiple bands, sometimes as many as 100 families, would coalesce in higher elevations where nuts, seeds, and berries could be collected during the fall. The bands dispersed into small groups in the spring and summer, to plant crops and collect desert plants in the lowlands (Khera and Mariella 1983). Collected resources included a variety of plants, fruits, and nuts (Khera and Mariella 1983). Agricultural products grown during late spring and early summer in the lowlands supplemented collected cactus fruits, such as saguaro. Domestic crops—including corn, beans, squash, and tobacco—were

planted along small streams and intermittent washes and near springs where pot watering and floodwater farming were feasible (Khera and Mariella 1983). Hunting was conducted in the uplands during the fall, although small game was taken opportunistically throughout the year.

The town of Wickenburg, which is located northwest of the study area, was founded in 1863 after the discovery of gold at the nearby Harquahala Mountains located approximately 30 miles to the west. Shortly thereafter, the town became a thriving community on the banks of the Hassayampa River as the mine drew people who established stores, saloons, and various other enterprises. Although limited by the less than dependable flow of the Hassayampa, some farming and ranching occurred to support the development of the community. Wickenburg became yet another Old West mining boomtown until the Vulture Mine faltered in 1873. The area's economy was further affected by the catastrophic failure of the Walnut Grove Dam in 1890. The rushing water not only killed approximately 70 people, but scoured the soils of the Hassayampa River floodplain and rendered the area unfit for agriculture.

In 1895, the railroad arrived in Wickenburg, revitalizing the town. A passenger depot was built and people once again began settling in the area. In the early twentieth century, ranching became the principal economic force in the area. Tourism also became a local industry as guest ranches were established. With the collapse of cattle prices, these guest ranches provided a buffer for the local economy (Pry 1997). The tourist trade was further invigorated when US Highway (US) 60 and US 89 were built in the 1930s. Despite setbacks during the Great Depression and World War II, the tourist industry was revitalized after the end of the war and as American car culture made travel along Arizona's byways a favorite pastime. Tourism continues today as the primary industry for the town.

B. Cultural Resources Inventory

The study area encompasses 40,795 acres and comprises land under the jurisdiction of the Bureau of Land Management (BLM) (4,622 acres), State Trust land administered by the Arizona State Land Department (4,634 acres), land under the jurisdiction of the Bureau of Reclamation (489 acres), and private land (31,049 acres) (Figure 3). Cultural resources considerations within the Hidden Waters Parkway corridor study area were identified from information gathered from AZSITE, the State's electronic inventory of cultural resources, and the State Historic Preservation Office in Phoenix. In addition, historic cadastral survey maps (General Land Office [GLO] plats) available from the BLM State Office in Phoenix were reviewed and the National Park Service's National Register Information System was electronically consulted to determine whether any properties listed on the National Register of Historic Places (NRHP) are located in the study area.

Cultural resources inventory data include records of prehistoric and historic properties that are greater than 50 years of age. Prehistoric and historic properties are classified as sites, buildings, structures, or objects. Properties that possess a significant concentration, linkage, or continuity or that are united historically or aesthetically by plan or physical development may be formally recognized as a district. The NRHP documents the appearance and importance of properties significant in our prehistory and history. To be listed in the NRHP, a property must be demonstrably significant under at least one of four criteria and must possess sufficient integrity in terms of the NRHP's seven aspects (location, design, setting, materials, workmanship, feeling and association). The criteria for NRHP eligibility are as follows: association with significant historic events that have contributed to broad patterns of history (Criterion A); association with the life of a person significant to the past (Criterion B); embodiment of an important design or method of construction, representative of the work of a master, embodiment of high artistic values, or representative of a distinguishable entity whose components may lack distinction (Criterion C); or potential to yield

scientifically important information about prehistory or history (Criterion D). Depending on the property type and criteria of significance, certain aspects of integrity may be weighted greater than others when evaluating a property's eligibility for listing in the NRHP.

Research indicates that 22 Class III pedestrian cultural resources surveys have previously been conducted within the established 40,795-acre study area (Figure 4; Table 1). Block and linear surveys were conducted for both the private and public sectors for a variety of project types, including road improvements, easements, and cell tower and utility line sitings. It is estimated that approximately 15 percent of the study area has been surveyed for cultural resources.

The records search also indicates that five cultural resource sites have been recorded within the study area (see Figure 4; Table 2). These sites include the in-use Indian School Road and the abandoned Wickenburg/Hassayampa Road, both historic roads; two historic abandoned mineral prospects; and one prehistoric site, a large lithic scatter. None of the sites are listed in the NRHP. Site AZ T:9:83 (ASM), Indian School Road, has been recommended eligible for inclusion in the NRHP under Criterion A, and AZ T:6:1(ASU), the prehistoric lithic scatter, has been recommended NRHP eligible under Criterion D.

Table 1. Previous research within the study area

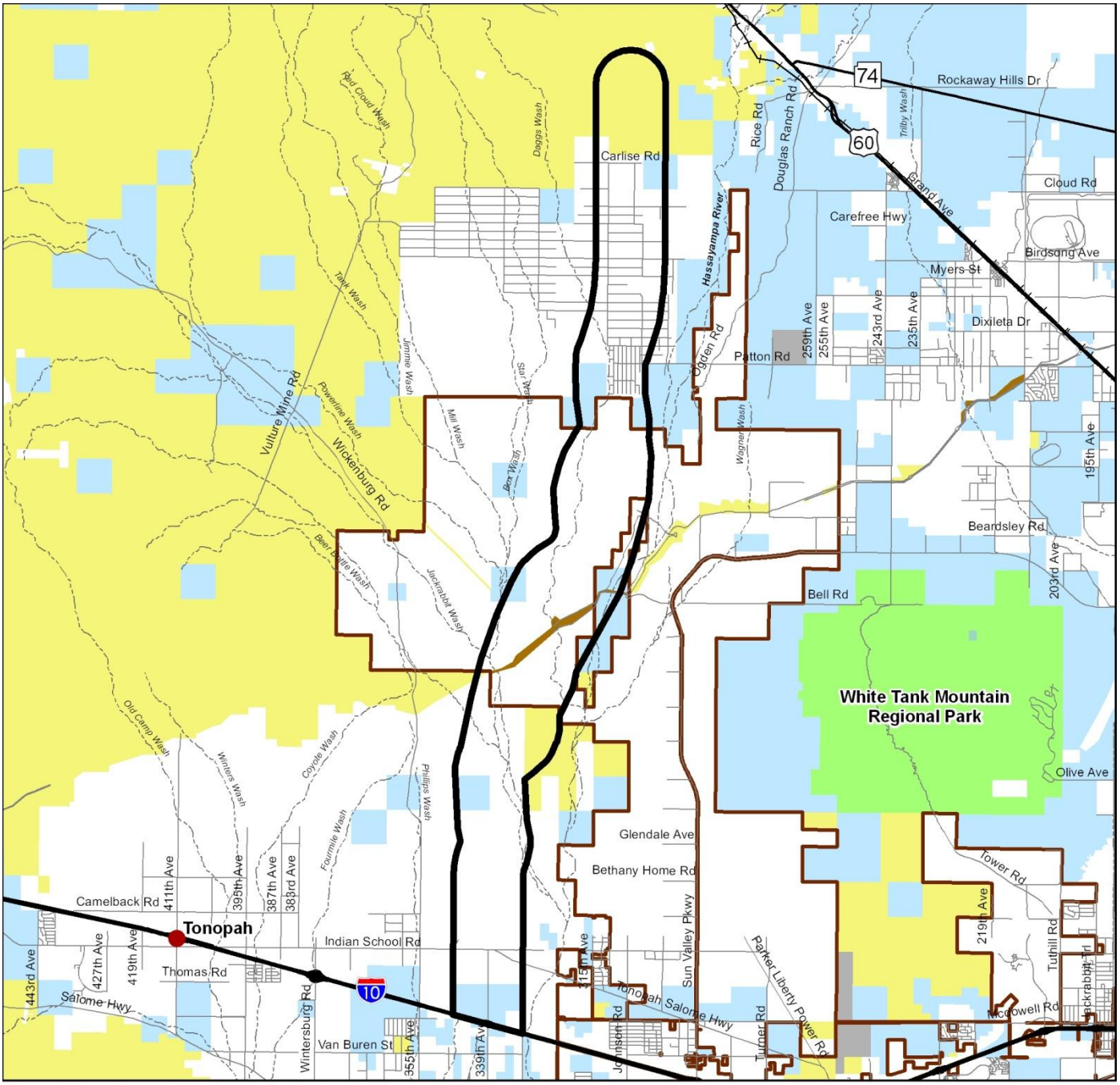
Reference number[a]	Author/Year	Reference number[a]	Author/Year
1972-5.ASM	Kemrer 1972	2000-723.ASM	Kearns et al. 2001
1978-68.ASM	Simonis 1978	2001-406.ASM	Baker and Webb 2001
1983-121.ASM	Keller 1983	2002-280.ASM	Walsh and Ogren 2002
1984-128.ASM	Keller 1986	2003-1379.ASM	Moreno et al. 2003
1986-249.ASM	Howard and Rogge 1986	2003-341.ASM	Foster 2002
1987-222.ASM	O'Brien et al. 1987	2004-239.ASM	Ellis 2000
1991-26.ASM	Lincoln 1991	2004-679.ASM	Unknown
1994-458.ASM	Purcell 1994	2005-381.ASM	Turner and Davis 2005
1998-259.ASM	Moreno 1998	2008-36.ASM	Orcholl 2008
1999-127.ASM	Moreno 1999	78-018.ASU	Unknown
2000-497.ASM	Lindly 2000	A75-199.MNA	Unknown

[a] USGS 7.5' Wintersburg, Ariz., 1984; Flatiron Mountain, Ariz., 1990; Star Well, Ariz., 1989; Daggs Tank, Ariz., 1988; Vulture Mine, Ariz., 1990; Wickenburg SW, Ariz., 1965.

Table 2. Previously identified cultural resources

Site number	Site description	Eligibility status
AZ T:9:79 (ASM)	Historic road; abandoned Wickenburg/Hassayampa Road	Recommended not eligible
AZ T:9:83 (ASM)	Historic road; in-use Indian School Road	Recommended eligible, Criterion A
AZ T:6:1 (ASU)	Prehistoric lithic scatter	Recommended eligible, Criterion D
AZ T:2:77 (ASM)	Historic mineral prospect	Recommended not eligible
AZ T:2:78 (ASM)	Historic mineral prospect	Recommended not eligible

[a] USGS 7.5'Wintersburg, Ariz., 1984; Flatiron Mountain, Ariz., 1990; Star Well, Ariz., 1989; Daggs Tank, Ariz., 1988; Vulture Mine, Ariz.,1990; Wickenburg SW, Ariz., 1965.



Source: Arizona Transportation Information System GIS Coverage (2007)

Key

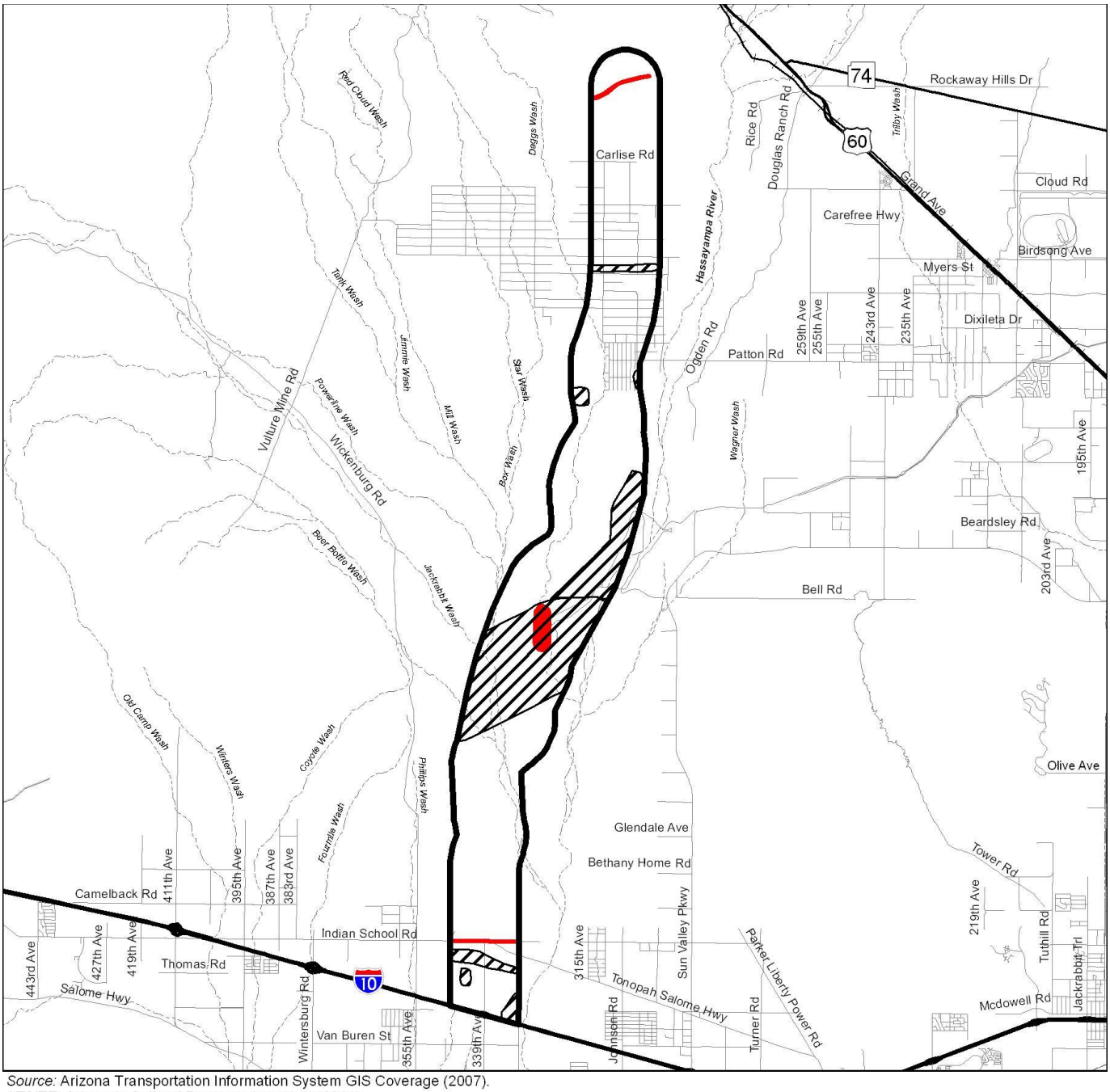
- Study Area
- Roads
- Railroad
- Watercourse
- Private Land
- Bureau of Land Management
- Bureau of Reclamation
- County Land
- Military Reservation
- Parks and Recreation
- State Trust Land
- Buckeye town limits

Miles

0 5

NORTH

Figure 3. Land jurisdictions and ownership



Source: Arizona Transportation Information System GIS Coverage (2007).
AZSITE, Arizona's Cultural Resource Inventory (2011).

Key

- Study area
- Roads
- Railroad
- Watercourse
- Previous Survey
- Previously Recorded Cultural Resources

Miles
0 5

NORTH

Figure 4. Cultural investigation results

GLO maps dating to 1919 depict old roads in the vicinity of Wickenburg, within the northern section of the study area. These old roads include a segment of the Morristown-Vulture Road in Section 1 of T5N, R5W and a segment of the Beardsley-Vulture Road in Section 36 of T5N, R5W. The 1919 map (plat no. 2751) also depicts a pipeline in Sections 19 and 30 of T6N, R4W. The referenced plat maps are listed in Table 3.

Table 3. Historic GLO maps and identified features within the study area

Plat #	Date filed	Township	Range	Sections containing features	Feature types
2630	4-1-1919	T1N	R5W	None	None
2653	6-16-1919	T2N	R5W	None	None
2676	6-16-1919	T3N	R5W	None	None
2701	6-16-1919	T4N	R5W	None	None
2700	6-16-1919	T4N	R4W	None	None
2725	8-14-1919	T5N	R5W	1, 12, 13, 24, 25, and 36	Roads
2724	8-14-1919	T5N	R4W	6 and 5	Roads
2753	12-24-1947	T6N	R5W	25	Roads
2751	8-14-1919	T6N	R4W	17, 19, 20, 29, 30, 31, and 32	Roads and a pipeline

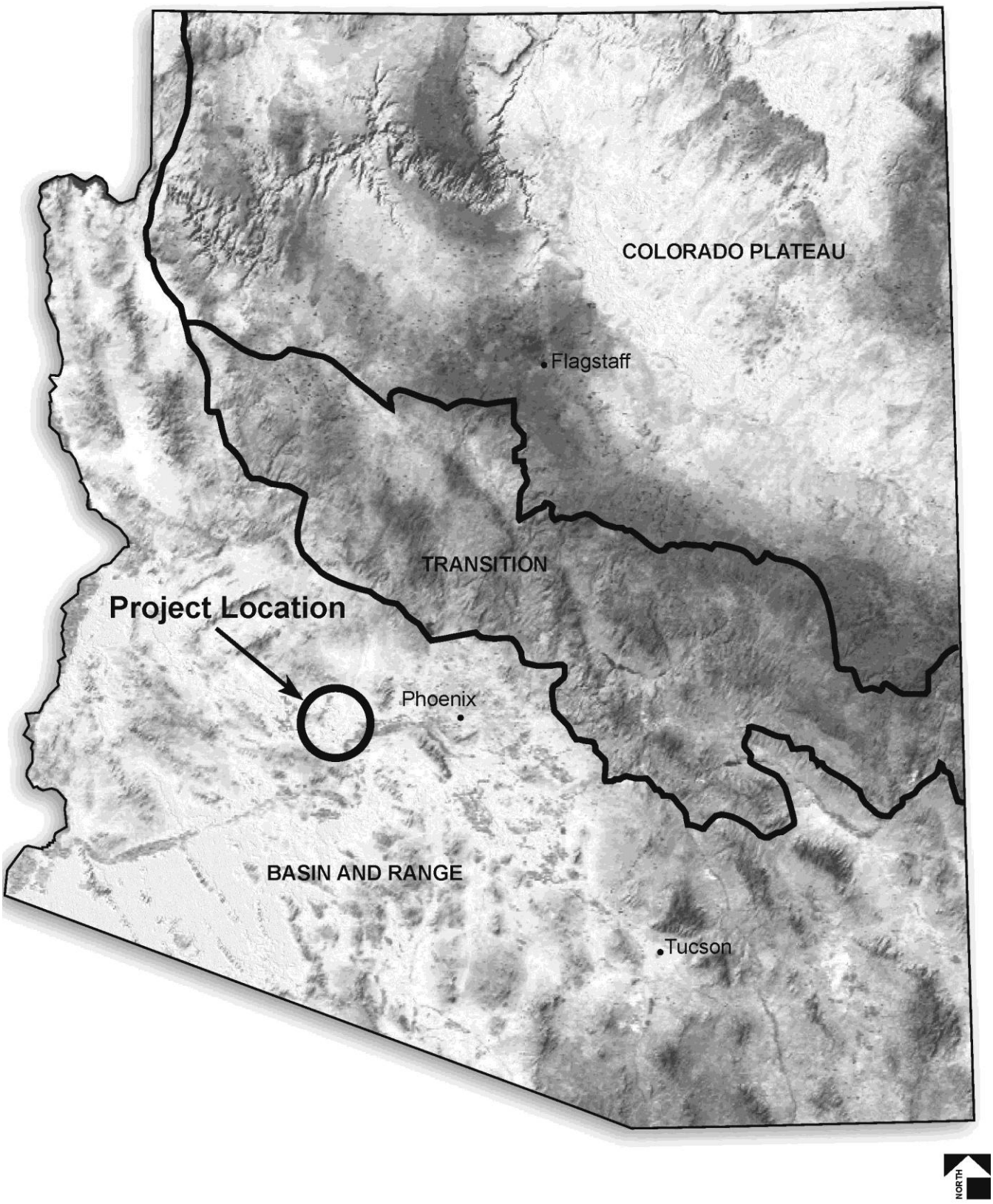
III. Natural Environment

This section describes the existing physical and natural environment within the study area in terms of topography/physiography, vegetation, wildlife, and sensitive species. The inventory of the physical and natural environment of the study area consisted of gathering resource data and information from various local, state, and federal agencies, including the Arizona Game and Fish Department (AGFD), the BLM, and the US Fish and Wildlife Service (USFWS). The characteristics of the physical and natural environment were also identified during a reconnaissance survey of the study area.

A. Topography/Physiography

The study area is located within the Basin and Range physiographic province of Central Arizona (USGS 1946), which is characterized by numerous mountain ranges rising abruptly from broad valleys or basins (Figure 5). Ranges and associated basins typically have a north-to-northeast trend with through-flowing drainages. Rocks exposed within this province consist of well-represented varieties of the three major types: igneous, metamorphic, and sedimentary (Hendricks 1985). The topography within the northern portion of the study area includes mostly mountainous terrain with open high-relief mountains, while the generalized topography within the central and southern portions of the study area include low, gently sloping mountains.

Elevation ranges from approximately 1,065 to 2,300 feet above mean sea level within the study area. Land within the northern portion of the study area includes rolling hills to steep mountains, but the majority of the study area lies on the valley floor just west of the Hassayampa River. Land within the central and southern portion of the study area is generally flat, with small drainages flowing primarily south and east where they join the Hassayampa River.



Source: US Geological Survey 1946

Figure 5. Physiographic provinces of Arizona

The northernmost end of the study area includes a small portion of the Lithic Torriorthents-Lithic Haplustolls-Rock Outcrop soil association (Hendricks 1985), which consists of well-drained, shallow soils and rock outcrop on semiarid, mid-elevation hills and mountains. These soils formed as a result of weathering from numerous different rock types (Hendricks 1985). The majority of the study area consists of soils from the Gunsight-Rillito-Pinal association (Hendricks 1985); these are well-drained soils on broad, shallowly dissected alluvial fans and valley slopes. These soils formed in calcareous, old mixed alluvium derived from volcanic rocks, schist, limestone, and granite (Hendricks 1985) and produce little forage for livestock and wildlife.

B. Vegetation

A small area in the northern portion of the study area supports vegetation that is typical of the Arizona Upland subdivision of the Sonoran Desertscrub biotic community (Turner and Brown 1994). However, the majority of the study area supports vegetation typical of the Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community (Turner and Brown 1994), which is characterized by high temperatures and generally low precipitation. Vegetation and habitat have been disturbed in the northern and southern ends of the study area where residential development exists.

From north to south, the vegetation becomes less dense and the landscape much more open; the topography and vegetation transitions from more densely vegetated rolling hills and mountains to open creosote flats. At the north end of the study area the dominant vegetation includes palo verde (*Cercidium* sp.), bursage (*Ambrosia* sp.), cholla (*Cylindropuntia* sp.), creosotebush (*Larrea tridentata*), saguaro (*Carnegiea gigantea*), ironwood (*Olneya tesota*), hedgehog cactus (*Echinocereus* sp.), barrel cactus (*Echinocactus* sp.), ocotillo (*Fonquieria splendens*), and prickly pear (*Opuntia* spp.) (Photograph 1). Through the central and southern portion of the study area the dominant vegetation includes creosotebush and, to a much lesser extent, bursage, buckwheat (*Eriogonum* sp.), cholla, ironwood, palo verde, and saguaro (Photographs 2 and 3). In addition, ground cover consisting of various grasses, forbs, and other herbaceous vegetation is present throughout the study area.

In the northern portion of the study area in the lands managed by BLM, the vegetation is relatively undisturbed and there is minimal disturbance from off-highway-vehicle activity. This area has retained much of the native vegetation associated with Sonoran Desertscrub vegetation communities (Photograph 1). The majority of vegetation disturbance occurs in the residential area at the northern end of the study area. Disturbance is characterized by dispersed residential buildings and illegal dumping of household and construction wastes (Photograph 4). In the central portion of the study area, development is minimal and vegetation is less disturbed. At the southern end of the study area, more low-density residential development exists, which has resulted in vegetation disturbance but to a lesser degree than the northern residential area.

C. Wildlife

Although small portions of the study area are developed, the study area continues to provide cover and foraging opportunities for wildlife due to the presence of native vegetation. The Hassayampa River acts as a natural movement corridor for wildlife (Figure 6). Mature and dense vegetation along the drainages throughout the study area provides wildlife habitat in the form of both cover sites and a corridor for movement, as well as a source of forage and water following precipitation. Wildlife likely to be found in the study area includes birds, such as red-tailed hawk (*Buteo jamaicensis*), cactus wren (*Campylorhynchus brunneicapillus*), white-winged dove (*Zenaida asiatica*), mourning dove (*Z. macroura*), Gila woodpecker (*Melanerpes uropygialis*), Gambel's quail (*Callipepla gambelii*), curved-billed thrasher

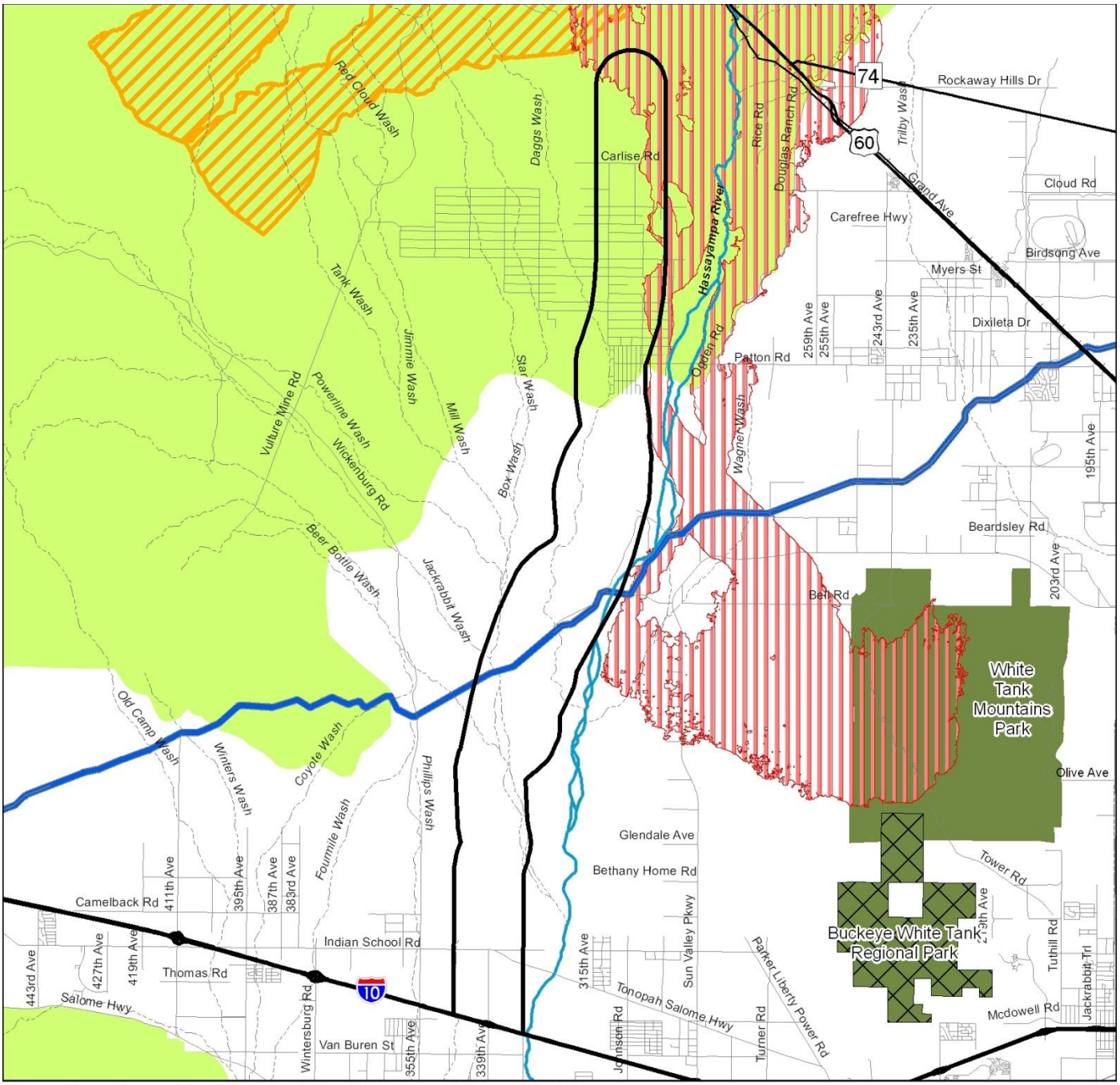
(*Toxostoma curvirostre*), and roadrunner (*Geococcyx californianus*); mammals, such as kangaroo rat (*Dipodomys* spp.), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), collared peccary (*Tayassu tajacu*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), and kit fox (*Vulpes macrotis*); and reptiles, such as the side-blotched lizard (*Uta stansburiana*), zebra-tailed lizard (*Callisaurus draconoides*), Sonoran desert tortoise (*Gopherus agassizii*), and rattlesnakes (*Crotalus* spp.).

Photograph 1. Sonoran Desertscrub vegetation typical of the far north end of the study area

Photograph 2. Characteristic vegetation and topography in the central portion of the study area

Photograph 3. Creosote flats typical of the southern portion of the study area

Photograph 4. Vegetation disturbance within the residential area at the northern end of the study area



Source: Arizona Transportation Information System GIS Coverage (2007); corridordesign.org.

Figure 6. Biological features

D. Sensitive Species and Habitat

The USFWS list of threatened, endangered, proposed, candidate, and conservation-agreement species potentially occurring in Maricopa County is provided in the Appendix. The study area does not contain suitable habitat for any threatened or endangered species included on the USFWS list. In addition, the study area does not occur within any proposed or designated critical habitat as listed under the Endangered Species Act (16 USC §§ 1531–1544, as amended). However, there is suitable habitat for Sonoran desert tortoise, a USFWS candidate species, within the study area.

A list of special-status species known to occur in the vicinity of the study area was requested from the AGFD Heritage Data Management System, and a scoping letter was sent to the AGFD. According to the Heritage Data Management System, Sonoran desert tortoise, occur within three miles of the northern portion of the study area (Appendix). The Sonoran desert tortoise is a USFWS candidate species, as well as a BLM sensitive species (Appendix; see Figure 6). The AGFD also noted that California leaf-nosed bat (*Macrotus californicus*), a BLM sensitive species, occur within three miles of the northern portion of the study area (Appendix). No other species of concern were recorded in or adjacent to the study area, according to the Heritage Data Management System.

The AGFD provided a scoping letter response dated May 10, 2011 (Appendix). The letter identified that the Sonoran desert tortoise and California leaf-nosed bat, and cave myotis (*Myotis velifer*) (a USFWS Species of Concern) have the potential to occur within or near the northern portion of the study area. In addition, the letter identified several linkages that traverse the study area, including the CAP canal (wildlife linkage 152), the Hassayampa River, the larger washes within the area, the Wickenburg-Hassayampa Linkage Wildlife Corridor (wildlife linkage 51), and the White Tanks – Hassayampa River Linkage Wildlife Corridor (wildlife linkage 65). The letter also noted that the AGFD is actively working on an additional habitat model that identifies a wildlife linkage between the White Tank Mountains and the Vulture/ Hieroglyphic Mountains and is actively pursuing conservation efforts in this area (Figure 6).

Sonoran desert tortoises typically inhabit bajadas and rocky slopes associated with Mojave desertscrub, Sonoran desertscrub, semidesert grassland, and chaparral. Elevations in these communities range from about 500 feet in Mojave desertscrub to about 5,300 feet in chaparral. In Sonoran desertscrub, desert tortoises occur most often in the paloverde-mixed cacti association with boulders and rock outcrops. These formations offer shelter sites, an important component and limiting factor of desert tortoise habitat. Most often, tortoises will excavate shallow burrows in deeper soils at the base of boulders and rock outcrops; however, caliche caves and the incised, undercut banks of washes are also important shelter sites. Desert tortoises may also rest directly under live or dead vegetation without constructing a burrow, particularly on warm summer nights (AGFD 2001; Arizona Interagency Desert Tortoise Team 1996). Suitable Sonoran desert tortoise habitat is present within the northern portion of the study area (see Figure 6); tortoises are likely to be found along the bajadas and rocky slopes within the desertscrub vegetation.

In the May 10, 2011 letter from AGFD, surveys for the Sonoran desert tortoise prior to construction were recommended. If any tortoises are encountered, they should be moved outside the construction site within 1 mile of its original location. A scientific collecting permit is required for this activity. Guidelines for tortoise handling are available at www.azgfd.gov/hgis/guidelines.aspx. In addition, it was noted that the BLM has requirements for the mitigation of lost Sonoran desert tortoise habitat on BLM land.

California leaf-nosed bats are primarily cave- and mine-dwelling bats in southern and western Arizona and are most commonly found within the Sonoran Desertscrub vegetation communities south of the Mogollon

Plateau. These bats remain active year-round since food is available and thus do not need to migrate or hibernate. California leaf-nosed bats primarily feed on large night-flying beetles, grasshoppers, and moths while in flight. They will also sometimes feed on fruits, including those of cacti. Little is known about the home range and local seasonal movements of the California leaf-nosed bat; their summer and winter range is essentially the same (Hoffmeister 1986). California leaf-nosed bats are likely to occur within the northern portion of the study area where caves and mines are present.

The Arizona Wildlife Linkages Workgroup has identified habitat blocks and potential linkage zones for wildlife movement within the state of Arizona in a report titled *Arizona Wildlife Linkages Assessment* (Arizona Wildlife Linkages Workgroup 2006). The study area is just south of wildlife linkage 51, the Wickenburg–Hassayampa Linkage Wildlife Corridor[1] (see Figure 6). Some of the target species that are identified for this linkage corridor include bighorn sheep (*Ovis Canadensis nelson*), collard peccary, mule deer, desert tortoise, and a number of riparian-dependent species (Beier et al. 2006). Roadways have the potential for direct mortality (i.e., roadkill) and habitat loss and to impede the movement of wildlife across the landscape, resulting in habitat fragmentation and the isolation of wildlife populations. Additional linkages identified by the AGFD include the Hassayampa River and other major washes within the study area and the CAP Canal. These linkages also serve as corridors for wildlife movement.

The AGFD identified concerns with the placement of a new road corridor close to the Hassayampa River. The introduction of artificial light and noise would create a barrier to wildlife movement and reduce habitat availability and would result in wildlife mortality due to vehicle collisions. Artificial lighting can alter light-sensitive cycles of different species and impair the individuals' ability to navigate through an area due to disorientation from and attraction to the artificial light source (Beier 2006 in AGFD 2011). Recommendations for minimizing impacts associated with artificial lighting provided in the letter include minimizing the number of lights and amount of illumination, strategic placement of lights and shielding the light so bulbs are not visible (Appendix). Increased noise levels have been identified as a barrier to wildlife movement by disturbing and repelling different species (Minton 1968 and Liddle 1997 in AGFD 2011). Future studies of the Hidden Waters Parkway corridor will need to address the concerns of AGFD and will require additional study. Continued coordination with AGFD, USFWS, and the BLM will occur.

IV. Land Use and Socioeconomics

A. Introduction

This section presents information on current land use; prime and unique farmlands; the economy, employment, and demographic composition of the area; environmental justice; and resources qualifying under Section 4(f) of the US Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act. The information on land use is presented to provide a framework for understanding the other elements of this section. A detailed discussion of land use, including zoning, ownership, and future development plans, is provided in Technical Memorandum No. 1 for this study.

[1] AGFD noted that the far north portion of the study area includes the Wickenburg–Hassayampa Linkage Wildlife Corridor; however, the GIS data for this wildlife corridor indicate that the corridor is actually just north of the study area.

B. General Land Use

The study area is located west of the Phoenix metropolitan area within a large expanse of Sonoran Desert land. The study area includes privately owned land within the town of Buckeye and unincorporated areas of Maricopa County and land managed by the BLM, the Bureau of Reclamation, and the Arizona State Land Department (see Figure 3).

Widely spaced rural development is concentrated at the southern and northern ends of the study area. The Whispering Ranch community is between Carlise Road and approximately Patton Road in the northern end of the study area. This community is characterized by large residential parcels. Within these parcels, houses of varying size and construction have been built on some parcels, and mobile homes occur as well. Many parcels have not been developed. Future residential development is anticipated in the central and southern portions of the study area (Figure 7).

BLM grazing allotments occur within the study area from just south of the Central Arizona Project (CAP) canal through the northern end of the study area. The allotments that occur partially within the study area include the Douglas, Cactus Garden, Caballeros, and Flat Iron (Figure 7).

Utilities consisting of power lines and the CAP Canal occur in the middle of the study area. No commercial or industrial development occurs within the study area, although sand and gravel operations occur within the Hassayampa River floodplain just east of the study area at the southern end and the Toyota Proving Grounds occur east of Whispering Ranch. There are several mines located within the BLM land at the northern end of the study area. This area is also used by the public for recreation, including hunting, camping and off-road vehicle recreation. Access to the mines and for recreation is via unimproved roads and trails.

C. Prime and Unique Farmland

The Natural Resource Conservation Service (NRCS) identifies farmlands that are prime, of statewide or local importance, or unique. These areas contain soils that are best suited for the production of food, feed, fiber, forage, and oilseed crops (*Federal Register*, Vol. 43, No. 21, January 31, 1978).

Of the 40,795 acres that compose the study area, approximately 950 acres are categorized as prime farmland if irrigated. However, the majority of these areas are within the Whispering Ranch parcels, and no land within the study area is currently or has recently been used for crop production. Areas of prime farmland are mostly located in the northern half of the study area in small strips along Daggs Wash, with a few small areas located further south (Figure 7). No unique farmland occurs within the study area.

D. Socioeconomic Considerations

Discussion of the socioeconomic environment of the study area includes an overview of the demographic composition of the area and addresses Section 4(f) of the US Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act. Title VI of the Civil Rights Act of 1964 and Environmental Justice considerations were identified using the US Census Bureau's *2000 Census of Population and Housing*.

1. Economy and Demographic Composition

There are no commercial services within the study area. Land on the northern portion of the study area is primarily accessible by jeep trail and, as such, is relatively undisturbed Sonoran Desert land. There are several mines within the BLM land and livestock grazing occurs.

At the southern end of the study area, low-density rural residential development occurs between I-10 and approximately Camelback Road. Grazing occurs in this area as well. West of the study area, agricultural development has occurred, but aside from grazing and the keeping of horses or other livestock, minimal agricultural development has occurred within the study area.

The demographic composition of the study area was calculated using the US Census Bureau's *2000 Summary File 3* data. Census tracts are small, relatively permanent statistical subdivisions of a county used for tallying census information; they do not cross county boundaries. They are delineated with the intention of being maintained over a long period of time, allowing longitudinal statistical comparisons. The size of census tracts varies widely depending on the density of settlement. Block groups are geographic subdivisions of census tracts; their primary purpose is to provide a geographic summary unit for census block data. A block group must comprise a reasonably compact and contiguous cluster of census blocks, the smallest subdivision used by the census. Each census tract contains a minimum of one block group and may have a maximum of nine block groups. The boundaries of some tracts and block groups extend beyond the study area; therefore, the exact population and demographic characteristics of the study area may vary from the represented block group data.

The study area lies entirely within two census tracts and a total of two block groups (Figure 8). Tract 405.09, Block Group 3 includes portions of Wickenburg, northern Buckeye, a small portion of Surprise, and unincorporated Maricopa County. Tract 506.02, Block Group 2 contains portions of Buckeye and northern Goodyear, and also some unincorporated areas of Maricopa County. The boundaries of these tracts and block groups extend beyond the study area; therefore, the exact population and demographic characteristics of the study area may vary from the data detailed in Tables 4 and 5. It is important to note that at the time of this study, decennial census data are 10 years old.

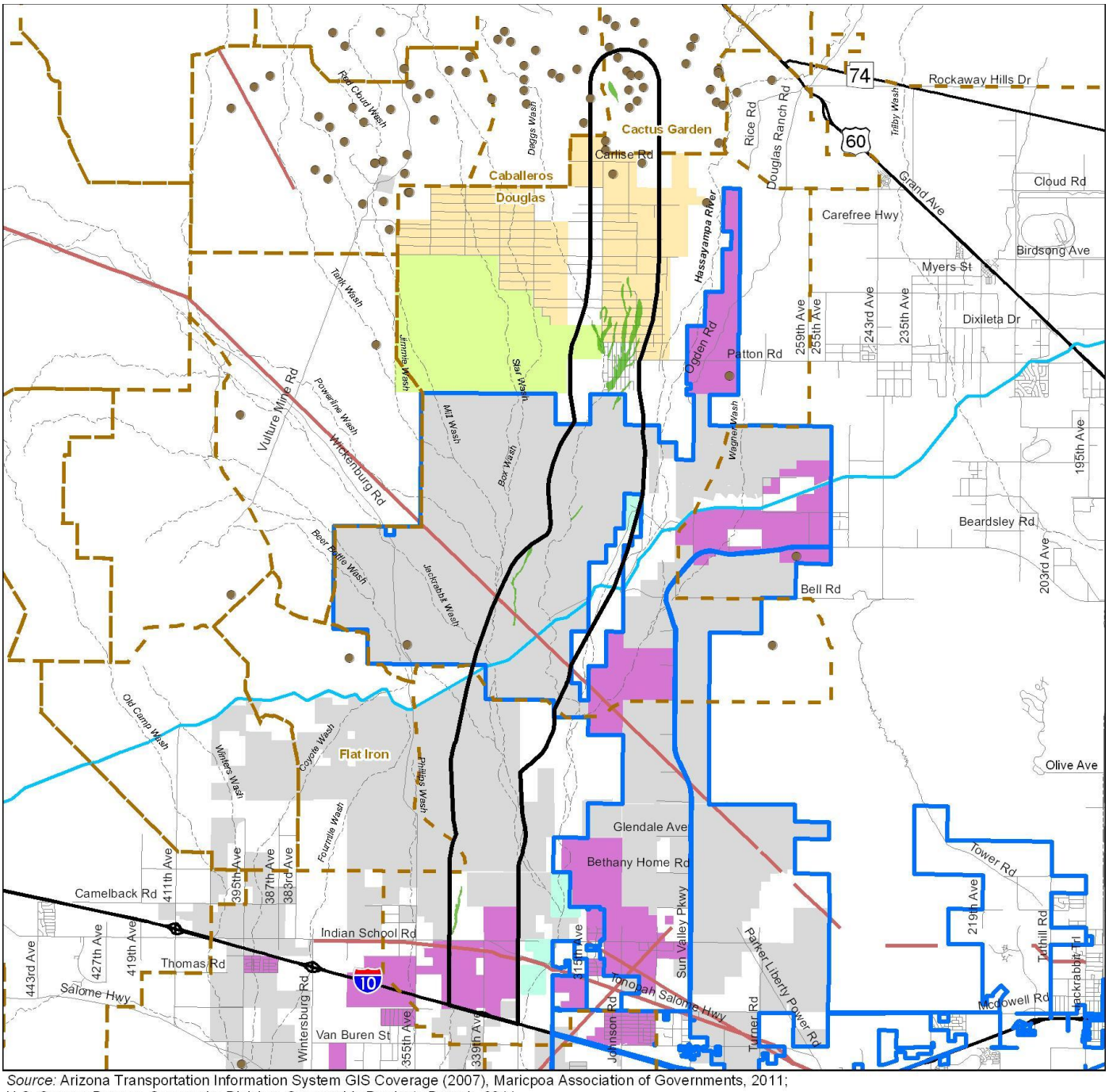
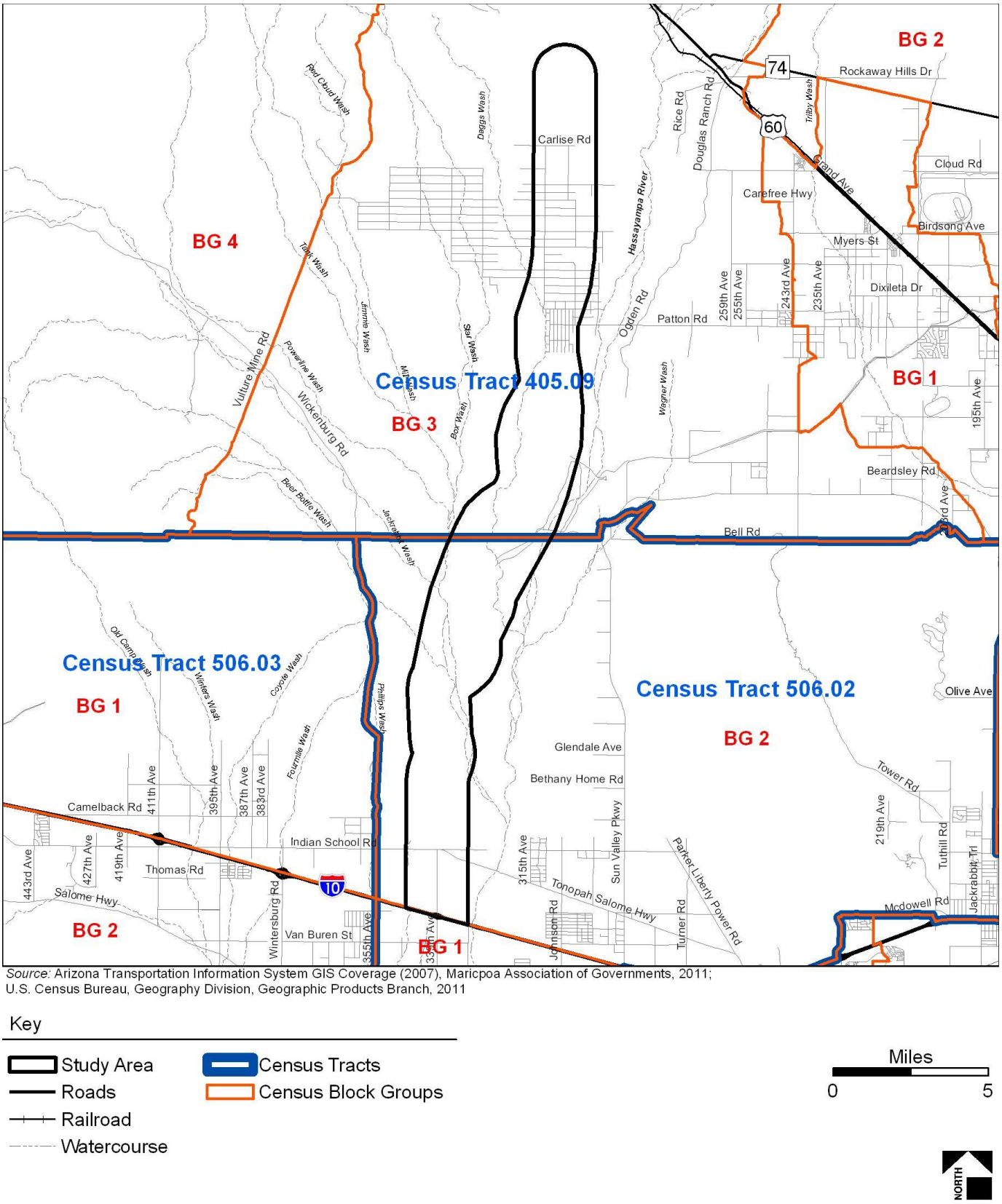


Figure 7. General land use



Source: Arizona Transportation Information System GIS Coverage (2007), Maricopa Association of Governments, 2011; U.S. Census Bureau, Geography Division, Geographic Products Branch, 2011

Figure 8. Census tracts and block groups

2. Population and Racial Composition

The two census block groups contain 5,756 people, of which more than 88 percent are White (Table 4). Hispanic, which is considered an ethnicity rather than a race, represents the second largest population with an average of 13.2 percent of the population throughout the two block groups. The population percentages of the block groups within the study area are similar to the racial composition of the town of Buckeye and Maricopa County, although the block groups include more people who identify as White and slightly more who identify as Native American. The shaded numbers in Tables 4 and 5 indicate the percentages that are higher than or equal to those for the town of Buckeye, the county, or both. Both the Hispanic and minority populations are lower than those occurring in Maricopa County and the town of Buckeye.

Table 4. 2000 population and racial demographics

Area (Tract # - Blk Gp)	Total Population	White		African American		Native American		Asian		Native Hawaiian/ Pacific Islander		Other		Two or More Races	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%
405.09-3	3,035	2,765	91.1	3	0.1	84	2.8	0	0.0	3	0.1	155	5.1	25	0.8
506.02-2	2,721	2,325	85.4	29	1.1	36	1.1	27	1.0	0	0.0	239	8.8	65	2.3
Total Tracts	5,756	5,090	88.4	32	0.6	120	2.1	27	0.6	3	0.1	394	6.8	90	1.6
Town of Buckeye	6,417	4,699	73.2	239	3.7	59	0.9	40	0.5	0	0.0	1,190	18.5	190	3.0
Maricopa County	3,072,149	2,375,391	77.3	111,584	3.6	55,177	1.8	66,294	2.2	3,811	0.1	365,320	11.9	94,572	3.1

Source: US Department of Commerce, Bureau of the Census. *Census 2000, Summary File 3.*
Note: # = number; % = percent.

Table 5. 2000 Hispanic and minority population

Area (Tract # - Blk Gp)	Hispanic		Minority	
	#	%	#	%
405.09-3	293	9.7	408	13.4
506.02-2	466	17.1	592	21.6
Total Tracts	759	13.2	1000	17.4
Town of Buckeye	2,288	35.7	2.676	41.7
Maricopa County	763,333	24.8	1,038,729	33.8

Source: US Department of Commerce, Bureau of the Census. *Census 2000, Summary File 3.*
Note: # = number; % = percent.
Minority = total population with the exception of the white non-Hispanic population.

E. Title VI/Environmental Justice Populations

Title VI of the Civil Rights Act of 1964 and Executive Order 12898 give guidance on identifying sensitive populations to prevent the exclusion of persons or populations from participation in, denial to persons or populations the benefits of any proposed action/activity, or subjection of persons or populations to discrimination because of race, color, or national origin. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," reaffirms the principles of Title VI and related statutes.

The executive order requires the consideration of low-income, minority, disabled, and elderly populations. A minority person refers to a person who is racially classified as African American, Asian American, Native American or Alaskan Native, or anyone who classifies as "other" race. Hispanics are also considered minorities regardless of their racial affiliation. Elderly refers to individuals 60 years of age and over. Low-income households include households where the income level is below the established poverty level. Non-institutionalized civilians who are 16 years of age and older are considered to be disabled if they report a mobility disability, a self-care limitation, or are work disabled.

To assess whether minority, elderly, low-income, or disabled populations are disproportionately represented near the study area, data for the block groups composing the study area are compared with the data for all of Maricopa County and the town of Buckeye. The shaded numbers in Table 6 indicate those percentages that are higher in the study area than those represented for the town of Buckeye or Maricopa County.

Table 6. Age 60 years and over, below poverty level, and disabled populations

Area (Tract # - Blk Gp)	Age 60 Years and Over		Below Poverty Level		Disabled	
	#	%	#	%	#	%
405.09-3	901	29.7	299	9.9	829	29.0
506.02-2	263	9.7	82	3.0	481	19.0
Total Tracts	1,164	20.2	371	6.6	1,310	24.2
Town of Buckeye	697	10.9	601	9.4	1,186	20.4
Maricopa County	465,849	15.2	226,957	7.5	488,279	17.4

Source: U.S. Department of Commerce, Bureau of the Census. Census 2000, Summary File 3.
Note: # = number; % = percent.

As shown by shaded cells in Table 6, the Title VI/Environmental Justice populations for the elderly and disabled in Block Group 405.09-3 and in the total for the tracts are notably higher than in Maricopa County or Buckeye. The percentage of people living in poverty in Block Group 405.09-3 is greater than Buckeye but less than Maricopa County. With the exception of Native Americans, who occur more frequently in the study area than in the town of Buckeye or Maricopa County, minorities have a smaller representation in the study area than either of the comparative populations (see Tables 4 and 5).

F. Employment

The study area does not support commercial or industrial development. Where development does occur, it is predominantly residential. Some livestock and small ranching occurs within the study area; the Toyota

Proving Grounds and agriculture occur adjacent to the corridor to the west; and sand and gravel operations are adjacent to the corridor to the east. Mines are present within the BLM land north of Carlise Road. Some mines within or near the northern end of the study area have been closed but the status of most of the mines needs further analysis (BLM 2011).

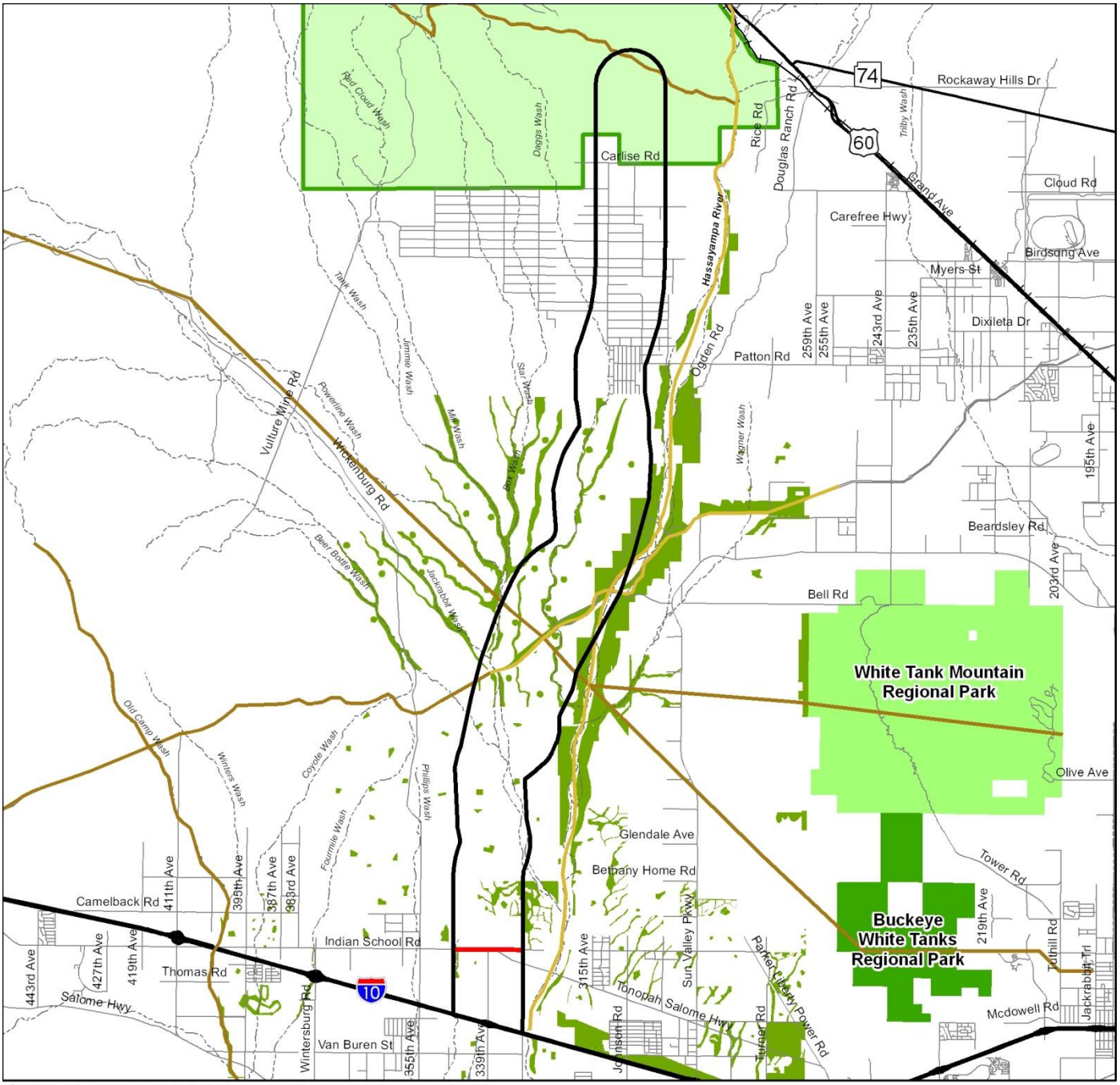
G. Section 4(f)

According to 49 USC §303(c), Section 4(f) of the US Department of Transportation Act of 1966 (as amended and recodified in 1983) was enacted as a means of protecting publicly owned parks, recreation areas, wildlife refuges, and historic sites of significance from conversion to transportation uses. This act states that the FHWA may approve a transportation program or project requiring the use of publicly owned land of a park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if (1) there is no prudent and feasible alternative to using that land and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

A use of a Section 4(f) resource, as defined in 23 Code of Federal Regulations (CFR) §774.17, occurs "(1) when land is permanently incorporated into a transportation facility; (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose . . .; or (3) when there is a constructive use of a Section 4(f) property . . ." A constructive use of a Section 4(f) resource occurs "when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired" (23 CFR §774.15[a]). As specified in 23 CFR §774.15[e], some examples of a constructive use are as follows:

> (1) The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a property protected by Section 4(f);
>
> (2) The proximity of the proposed project substantially impairs esthetic features or attributes of a property protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the property. Examples of substantial impairment . . . would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a Section 4(f) property which derives its value in substantial part due to its setting;
>
> (3) The project results in a restriction of access which substantially diminishes the utility of a significant publicly owned park, recreation area, or a historic site.

No publicly owned parks, recreation areas, or wildlife refuges currently exist within the study area. However, cultural resources sites, numerous recreational trails, and a regional park are proposed within the study area. The Maricopa County Regional Trail System Plan (Maricopa County Trails Commission 2004) identifies a proposed regional park at the northern end of the study area within the BLM land. In addition, portions of Priority 3 and Priority 4 Segment trails occur (Figure 9). Priority 3 Segment trails are regional corridors that are not key components to the regional system but that may become important in the future. Priority 3 Segment trails within the study area occur along the CAP Canal and Hassayampa River. Priority 4 Segment trails are conceptual regional corridors that are not key components to the regional system but that may become so in the future. As development occurs, these trails will likely be developed. Priority 4



Source: Arizona Transportation Information System GIS Coverage (2007), Maricpoa Association of Governments, 2011.

Key

- Study Area
- Roads
- Railroad
- Watercourse
- Proposed Regional Park
- Proposed Active / Passive Open Space
- Priority 3 Trail Segment
- Priority 4 Trail Segment
- Previously recorded cultural resource
- White Tank Mountain Regional Park
- Buckeye White Tanks Regional Park

Miles

0 5

NORTH

Figure 9. Potential Section 4(f) considerations within the study area

segment trails in the study area occur at the northern end of the project from the Hassayampa River across the BLM land and along the power line corridor that occurs in the middle of the study area.

The Town of Buckeye General Land Use Plan identified a linear open space area along the CAP Canal and an open space central to the Douglas Ranch master planned community in the central part of the study area (Town of Buckeye 2008). Within the Land Use Plan, the purpose of open space is to preserve areas with minimal disturbance; provide dedicated preserve areas; provide educational and park facilities; provide an area for plant salvage; extend public trails; and provide trail heads for equestrian, hiking, and mountain biking recreational areas.

Planned trails and parks identified within approved planning documents are potential Section 4(f) resources as are certain cultural resources. A Section 4(f) evaluation would be completed when specific potential alignments are identified.

H. Section 6(f)

Land and Water Conservation Fund Act provides a means by which state and local governments can obtain grants to acquire or make improvements to parks and recreation areas. Section 6(f) of this act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of the Interior's National Park Service. Section 6(f) requires that replacement land of equal value, location, and usefulness are provided as conditions to the conversion. No Section 6(f) properties or developments were identified as occurring within the study area.

I. Other Considerations

From I-10 to approximately the Bethany Home Road alignment, the study area is within the 10-mile radius Emergency Planning Zone for the Palo Verde Nuclear Generation Station. The northern terminus of the corridor is within the 35 miles of the station. Within the 10-mile radius, emergency planning indicates the major roads of the area, including I-10 and 355th Avenue, as being emergency evacuation routes. Given the proximity to the station, any alignment within the study area would likely be included in future updates of the emergency plan and would provide additional egress from the area in the event of an emergency.

V. Visual Resources

The study area is relatively undeveloped and contains large areas of relatively undisturbed desert landscape. The rolling terrain in the northern part of the area along with the slightly higher altitude and high concentration of washes has resulted in a varied landscape with large numbers of saguaros and a wide variety of cactus, which provides a high-quality visual experience for people viewing the area. The middle and southern ends of the study area are flatter and dominated by creosotebush. While still providing an undeveloped natural view, the flatter land and limited variety in vegetation reduces the overall visual quality of the area. The developed areas, particularly in the northern portion of the study area reduce the visual experience of the area due to exterior storage on private property and dumping that has occurred. Dumping is more common in the northern developed portion of the study area but occurs in the south as well.

Within the study area, there are several areas that are managed by the BLM. These occur south of the CAP Canal from the Northern Avenue alignment north to approximately the Cactus Road alignment and from approximately the 339th Avenue alignment east to the Hassayampa River. In addition, the northern end of the corridor, above Carlise Road, is also managed by the BLM (see Figure 3). The resources for the

BLM land within the study area are managed under the Agua Fria National Monument/Bradshaw-Harquahala Planning Area Resource Management Plan RMP (BLM 2010). The northern end of the study area is within the Hassayampa Management Unit. BLM Visual Resource Management (VRM) classifications have been assigned to BLM land within the study area (BLM 2010). These classifications are identified in Figure 10.

Almost all of the BLM land south of the CAP Canal is within Class IV. Within Class IV areas, high levels of change to the characteristic landscape are acceptable. Management activities may dominate the view and be the major focus of the viewer's attention, although every attempt should be made to minimize the impact of activities through careful location, minimal disturbance, and repeating the basic elements (BLM 2010).

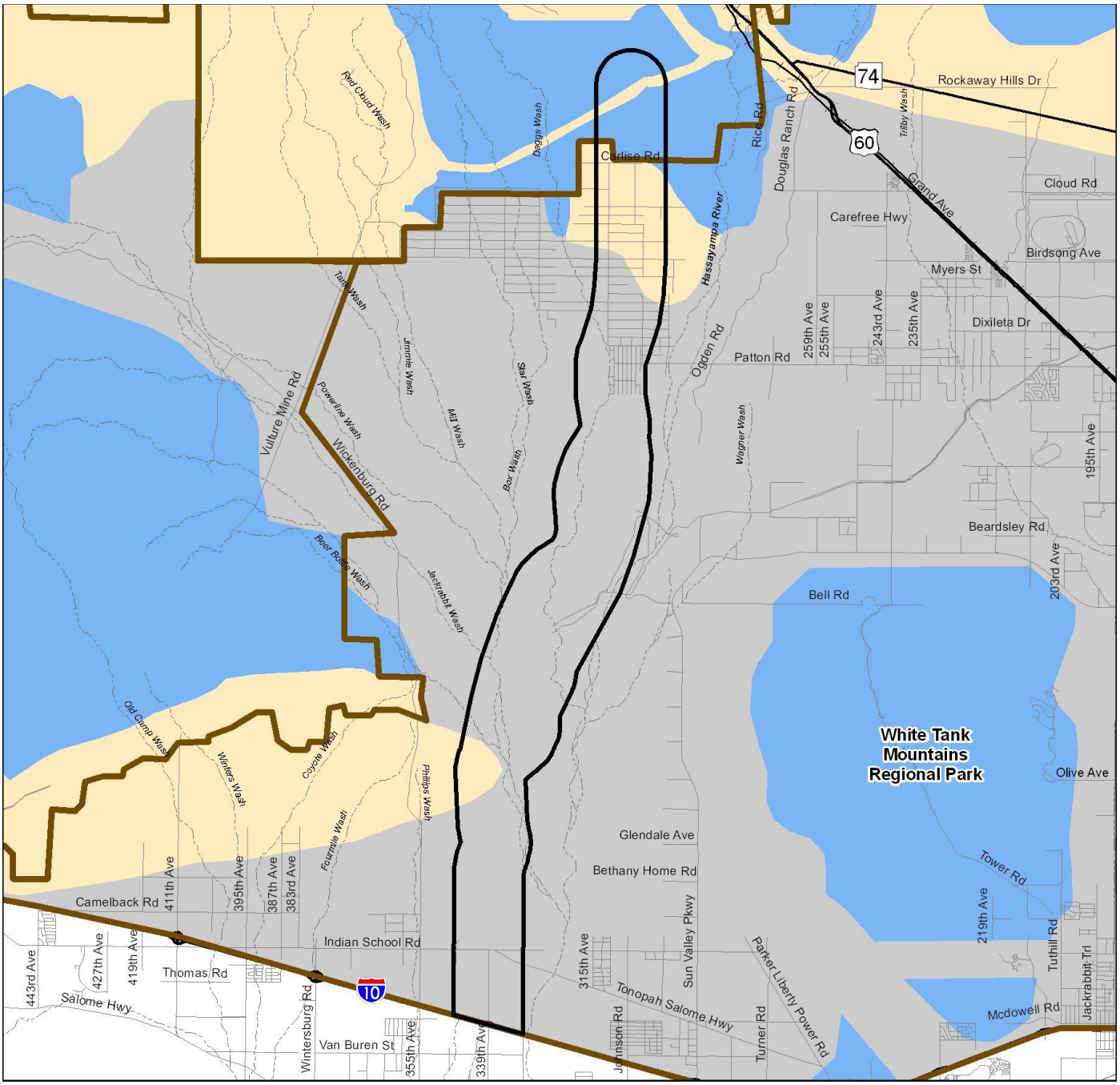
The BLM land north of Carlise Road has areas that are identified as Class II and Class III. Of the VRM classes that occur within the study area, Class II is the most restrictive to the allowable impacts on visual quality. The VRM Class II objective is to retain the existing character of the landscape, and changes to the characteristic landscape should be low. While management activities may be seen, they should not attract attention. Changes must repeat the surrounding basic elements of form, line, color, and texture of predominant natural features. Class II areas occur across the northern tip of the study area. It is anticipated that all potential alignments would cross Class II BLM land. The VRM Class III objective is to partially retain the exiting character of the landscape, and changes to this landscape may be moderate. These changes should not dominate the view and should repeat basic elements found in the surrounding natural features. Class III lands occur between Class II land at the northern limits of the study area and Carlise Road and an area just north of the Northern Avenue alignment. Coordination with the BLM would take place during future analyses to incorporate these visual quality requirements.

VI. Water Resources

This section describes the surface and groundwater resources and potential Clean Water Act Section 401 and 404 requirements within the study area. Floodplains are addressed in Technical Memorandum No. 3. The study area occurs within the Arizona Department of Water Resources (ADWR) Phoenix Active Management Area (AMA), Hassayampa Subbasin. Data pertaining to surface water, ground water, water quality and wells was obtained from the ADWR.

A. Surface Water Resources and Jurisdictional Waters

Surface water within the study area generally flows to the south and east. The Hassayampa River is the major drainage within the study area. This river originates in the Bradshaw Mountains south of Prescott and flows to the south, terminating at its confluence with the Gila River. While there are three reaches of the Hassayampa River that have perennial flow, the majority of the river, including the entire study area, is ephemeral and flows primarily in response to precipitation. Numerous tributaries drain to the Hassayampa River. These tributaries are also ephemeral and most runoff infiltrates before reaching the Hassayampa River (ADWR 2005). The Hassayampa River and a total of 5 named and 14 unnamed ephemeral washes occur within the study area, all of which may be considered waters of the United States (Arizona State Land Department 1993). Some of the larger tributaries that occur within the study area include Daggs Wash, Star Wash, Beer Bottle Wash, Dickey Wash and Jackrabbit Wash (Figure 11). It is not anticipated that wetlands would be impacted by the project. No unique or impaired waters designated by the US Environmental Protection Agency (EPA) or the Arizona Department of Environmental Quality (ADEQ) are located within or in the vicinity (i.e., one mile) of the area of potential affect (EPA 2009; ADEQ 2009).



Source: Arizona Transportation Information System GIS Coverage (2007)

Key

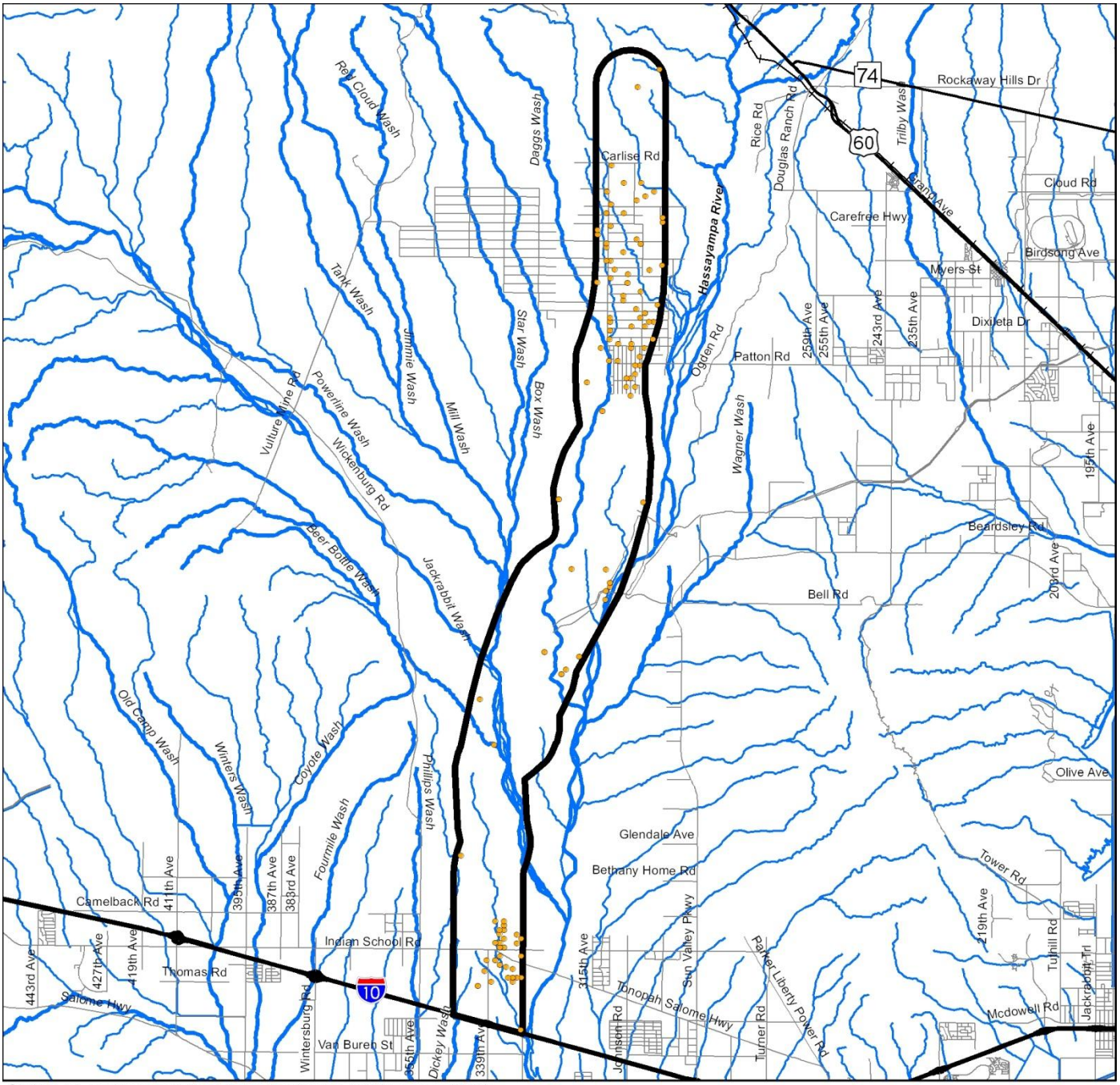
- Study Area
- Roads
- Railroad
- Watercourse
- BLM Hassayampa Management Unit
- Class II
- Class III
- Class IV

Miles

0 5

NORTH

Figure 10. BLM Visual Resource Management classifications



Source: Arizona Transportation Information System GIS Coverage (2007); Arizona Department of Water Resources.

Figure 11. Surface hydrology

The US Army Corps of Engineers (Corps) regulates activities that discharge dredged or fill materials into jurisdictional waters and issues permits for these discharges under Section 404 of the CWA. Coordination will be initiated with the Corps to determine the type of permit required. A Section 404 Nationwide Permit No. 14 (Linear Transportation Projects) or a Section 404 Individual Permit will be required for the proposed improvements contingent on the extent of excavation and fill within waters of the US required for roadway and drainage improvements. A Section 404 Individual Permit would be required for the proposed improvements if a jurisdictional special aquatic site, such as a wetland, is impacted by project activities. Section 401 certification for the project will be issued by the ADEQ and would be either conditional or individual based on the type of Section 404 permit necessary.

B. Groundwater Resources

Major aquifers within the Phoenix AMA generally occur within recent stream alluvium and basin fill with some occurring within sedimentary rock. Approximately 24,100 acre-feet of recharge occurs per year. Natural recharge primarily occurs at mountain fronts and within streambeds. Groundwater within this Hassayampa Subbasin generally flows to the south. However, groundwater flows have been artificially modified to the southwest due to a cone of depression in the Tonopah Desert surrounding the community of Tonopah and further south in the Centennial Wash area near the Palo Verde Nuclear Generating Station. Within the study area, depth to groundwater varies from approximately 500 feet below the surface in the northern portion of the study area to less than 100 feet near the Hassayampa River at the center of the study area (ADWR 2010). In comparing groundwater levels within the study area between 1991 and 1992 and 2002 and 2003, groundwater levels have generally declined by about 1–15 feet in the southern half of the study area. Conversely, groundwater levels have risen by approximately 1–15 feet in the northern half of the study area (ADWR 2010). There are approximately 140 wells registered within the study area (ADWR 2011). Wells predominantly occur in the southern end and northern end of the study area in association with development. A few wells occur in the middle of the study area near the CAP Canal (see Figure 11).

C. Water Quality

All potable water within and in the vicinity of the study area comes from groundwater. Water quality within the subbasin is generally suitable for most uses. In the Tonopah Arlington area or southern end of the study area, high total dissolved solids and fluorides occur, and in some cases, nitrates must be removed to reach potable standards (Maricopa County 2000). Groundwater contamination has been identified at 68 sites. One site with known contamination (voluntary remediation program site), the El Paso Natural Gas Gila Compressor Station, occurs within the study area at the northern end of the study area (ADWR 2010). At this site, the soil and groundwater have been contaminated with chromium, fluoride, nitrite, nitrate, lead, and arsenic (ADWR 2010).

VII. Hazardous Materials

Hazardous materials are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The ADEQ implements CERCLA, commonly known as the Superfund, and its amendment, the Superfund Amendments and Reauthorization Act (SARA) of 1986. The inherent environmental concerns associated with hazardous materials and solid waste landfills require a preliminary investigation into the location of permitted and non-regulated hazardous material sites and solid waste facilities within the study area.

The following references were reviewed for evidence of hazardous materials within the study area: the Arizona Water Quality Assurance Revolving Fund (WQARF) Registry; the ADEQ Leaking Underground Storage Tank (LUST) List; the ADEQ Underground Storage Tank (UST) List; the ADEQ Drywell Registration; the ADEQ Hazardous Material (HAZMAT) Incident Logbook (HMIL); and the Arizona Directory of Active/Inactive Landfills and Closed Solid Waste Landfills; the Facility Registry System (FRS) database; the Aerometric Information Retrieval System/AIRS Facility Subsystem (AIRS/AFS) database, the Comprehensive Environmental Response database, Compensation, and Liability Information System (CERCLIS) database; Water Discharge Permits; the Enforcement and Compliance History Online (ECHO) database; the National Response Center Emergency Response Notification System (ERNS) database; and the Resource Conservation and Recovery Act (RCRA) database.

Three incidents have occurred adjacent to the study area according to the HMIL. These incidents include a gasoline spill at milepost (MP) 105 on I-10; a gasoline, oil, and antifreeze spill at MP 104.8; and an effluent wastewater spill at the APS Hassayampa pump station. No WQARF, LUST, drywells, septic landfills, septic haulers, waste tire facilities, or brownfields were identified within the study area. One UST was identified adjacent to the site at the Toyota Proving Grounds.

A review of the EPA FRS database revealed 9 facilities in or near the study area. These include C&W Mining in the middle portion of the study area; Hanson Aggregates of Arizona Inc., Hassayampa Ranch WRF and WRF-Outfall 001, and Toon Tail in the southern portion of the study area; and the Toyota Proving Ground and Smith Mill Site in the northern portion of the study area. In addition, two sites were identified that may occur within or near the study area, but insufficient information was provided to identify their location. These sites include the Golden Eagle No. 1 Mine and the Hassayampa Mine.

The CERCLIS database identified the Smith Mill site, which is at the northern end of the study area just west of the Hassayampa River. Two ECHO facilities occur near the study area, one at the Toyota Proving Ground just west of the northern end of the study area and the second at the Hassayampa Pumping Station just east of the area north of the CAP canal. The Toyota Proving Ground is also listed as a RCRA site, along with the CAP-Aqueduct-Hassayampa River. No CERCLIS or AIRS/AFS sites or water discharge permits were identified for the study area. Finally, three ERNS incidents have occurred near the study area, two along I-10 at MP 103 and MP 104.2 and one at the Hassayampa Pump Station.

Numerous illegal dump sites were observed within the northern portion of the study area in Whispering Ranch. The observed dump sites primarily contained construction debris and tires (Photograph 5) with the exception of one particularly large dump site located along Painted Wagon Road. In addition to construction debris and tires, this site also contained empty quart sized oil containers, batteries, paint thinner tins, aerosol bottles and like materials and also domestic garbage (Photograph 6).

Photograph 5. Illegal dump site with construction debris

Photograph 6. Large illegal dump site at Painted Wagon Road

VIII. Noise

MCDOT adopted a Noise Abatement Policy in April 1998, revised in 2001, that sets guidelines to determine the need, feasibility, and reasonableness of noise abatement measures for all roadway projects. This policy is based on the currently accepted practices and procedures used by federal and state transportation agencies to assess highway-related noise impacts. For all construction projects, MCDOT is committed to ascertaining existing conditions, identifying potential noise receptors, and evaluating the nature of the project and its potential to impact those prospective noise receptors. As directed by 23 CFR § 772, the FHWA has developed specific, hourly, A-weighted noise abatement criteria (NAC) that serve as the upper limit of acceptable traffic noise levels for various types of land use (Table 7).

Noise activity Categories B, C, D, and E are found within the study area. Residential areas make up activity Category B and E uses, and activity Category C is made up of utility uses. Undeveloped lands compose activity Category D.

Abatement is considered if the anticipated sound levels for this study area meet or exceed the thresholds for each of the land use categories or approach 67 dBA Leq[2] for Category B-type land uses. “Approach” is considered to be 66 dBA Leq. These levels are typically applied to exterior areas where lower noise levels would be of benefit. If it is likely that the predicted noise level will approach or exceed the NAC, or cause a substantial (15 dBA) increase over existing traffic noise level, it is a MCDOT policy to evaluate the impacted properties for possible abatement. Noise abatement measures must be reasonable and feasible. Feasibility depends primarily on engineering considerations (e.g., can a barrier be constructed given the topography of the location; can substantial noise reduction be achieved given certain access, drainage, safety, or maintenance requirements; are other noise sources present in the area). The reasonableness of any noise abatement measure is discussed with the affected property owner, and mutual agreement is required for construction of a barrier.

[2] Leq refers to the equivalent, steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same period. A-weighting emphasizes certain frequencies to approximate how sound is perceived by human hearing (dBA).

Table 7. Noise abatement criteria

Activity Category	Description	Leq(h)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 dBA (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 dBA (exterior)
C	Developed lands, properties, or activities not included in Categories A or B.	72 dBA (exterior)
D	Undeveloped lands.	None
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 dBA (interior)

Source: 23 CFR § 772.

Note: Leq refers to the equivalent, steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same period. A-weighting emphasizes certain frequencies to approximate how sound is perceived by human hearing (dbA).

Current noise levels within the study area are very low. Within the residential area at the northern end of the study area, minor noise contribution from a generator or idling motor could be heard along with natural sounds such as birds. In the developed area at the southern end of the study area, while noise levels were still very low, the noise generated by vehicles on I-10 could be heard, as could occasional sounds from sand and gravel operations located just east of the study area and aircraft overflying the area.

Potential noise receptors identified on the Maricopa County Assessor's GIS Interactive Map and confirmed in a visual survey include residences located in the north and south ends of the study area. Potential impacts to noise receivers would be evaluated as the project is further defined and site specific improvements identified.

IX. Air Quality

The federal Clean Air Act of 1970 established National Ambient Air Quality Standards (NAAQS) for six pollutants. These pollutants, referred to as the "criteria pollutants," include carbon monoxide (CO), nitrogen dioxide, ozone (O_3), particulate matter (PM_{10}), sulfur dioxide, and lead. A major source of CO and nitrogen dioxide is vehicular emissions. Another major source of nitrogen dioxide is power plants. Using sunlight as a catalyst, O_3 is created through a complex reaction of hydrocarbons and oxides of nitrogen. Sources of the O_3 precursors include vehicle emissions, power plants, and service stations. PM_{10} sources include vehicular emissions and the re-suspension of road dust by vehicular activity. Table 8 lists the current standards.

On January 6, 2010, the EPA proposed to strengthen the NAAQS for ground-level ozone, which is the main component of smog. The proposed revisions are based on the scientific evidence about ozone and its effects on the people and the environment. The EPA has proposed to strengthen the 8-hour Primary O_3 standard to a level with the range of 0.060–0.070 parts per million (ppm). The State of Arizona standards are identical to the NAAQS.

Locations that fail to meet the NAAQS are categorized by the EPA as nonattainment areas. Nonattainment areas are subject to rules, ordinances, and statutes identified in the State Implementation Plan (SIP) that are established to control emissions and improve the overall air quality within the area to a point where the emissions are in compliance with the NAAQS.

Table 8. National ambient air quality standards

Pollutant	Averaging Time	Primary Standard	Secondary Standard
CO	1-hour	40 µg/m^3[(a)]; 35 ppm[(b)]	*[c]
	8-hour	10 µg/m^3; 9 ppm	*
Nitrogen dioxide	Annual	53 ppb[d]	53 ppb
	1-hour	100 ppb	*
O_3	8-hour	0.075 ppm	0.075 ppm
PM_{10}	24-hour	150 µg/m^3	150 µg/m^3
$PM_{2.5}$	24-hour	35 µg/m^3	35 µg/m^3
	Annual	15 µg/m^3	15 µg/m^3
Sulfur dioxide	1-hour	75 ppb	*
	24-hour	365 µg/m^3; 0.14 ppm	0
	Annual	80 µg/m^3; 0.03 ppm	0
Lead	Rolling 3-month average	0.15 µg/m^3	0.15 µg/m^3
	Quarterly average	1.5 µg/m^3	1.5 µg/m^3

Source: Maricopa County Department of Transportation.
Note: Primary standards are adopted to protect public health. Secondary standards are adopted to protect public welfare.
[a] µg/m^3 is micrograms per cubic meter; [b] ppm is parts per million; [c] * is No Standard; [d] ppb is parts per billion.

A. Nonattainment and Maintenance Areas

Within the Phoenix metropolitan area, nonattainment areas are identified for PM_{10} and O_3 and a maintenance area is identified for CO. The study area is located within the Maricopa nonattainment area for O_3 but is located west of CO maintenance area and the PM_{10} nonattainment area (Maricopa County 2011). The study area is in attainment of all other NAAQS.

B. Conformity

The Clean Air Act Amendments enacted in 1990 defined conformity to a SIP as meaning "conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS" (*Federal Register*, November 30, 1993). The conformity determinations for federal actions related to transportation projects must meet the requirements of 40 CFR §§ 51 and 93.

Since the study area is in an air quality nonattainment area, the transportation control measures in the SIPs and the Federal Implementation Plans (FIPs) will apply. The project will need to be included in an approved State Transportation Improvement Program (STIP) for at least one year, and no more than three years, before construction. That STIP will have to be approved by the FHWA and EPA as conforming to the SIP and the FIP.

Future transportation improvements will also follow to the extent possible recommendations given by the MAG Regional Transportation Plan, a plan to ensure that the additional roadway does not cause or contribute to new violations of the air quality standards and assists in the conformity of the existing air quality improvement plans. Construction activities have a higher potential to result in the deterioration of

the existing air quality on a temporary basis. Such impacts will be localized. Dust generated by construction activities will be controlled in accordance with Maricopa County Air Pollution Regulations (Maricopa County Air Quality Department Rule 310) and as stipulated in the required Dust Control permit.

C. Mobile Source Air Toxics

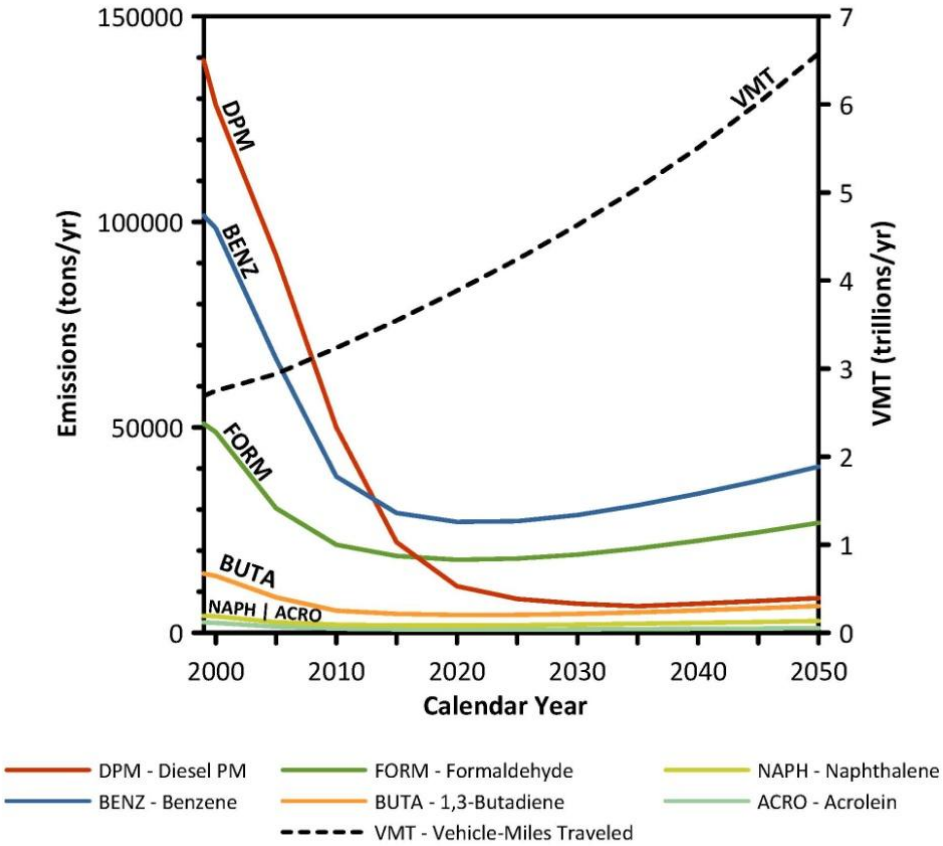
In addition to criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), and stationary sources (e.g., factories or refineries).

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act that consist of compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

Regulations for vehicle engines and fuels mandated by EPA will cause an overall significant decline in MSAT emissions over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOBILE 6.2 model forecasts a combined reduction of 72 percent in the total annual emission rate for the priority MSATs from 1999 to 2050 while vehicle-miles of travel are projected to increase by 145 percent (Figure 12).

In February 2007, EPA issued a final rule to reduce hazardous air pollutants from mobile sources. The final standards will lower emissions of benzene and other air toxics in three ways: (1) by lowering the benzene content in gasoline, (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures, and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers. Under this rule, EPA is requiring that, beginning in 2011, refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume on all gasoline (the national benzene content of gasoline today is about 1.0 percent by volume). In addition, EPA is adopting new standards to reduce nonmethane hydrocarbon exhaust emissions from new gasoline-fueled passenger vehicles at colder temperatures below 75°F. Nonmethane hydrocarbons include many MSATs, such as benzene. Finally, the February 2007 rule establishes standards that will limit hydrocarbon emissions that evaporate or permeate through portable fuel containers such as gas cans.

EPA expects that the new fuel benzene standard and hydrocarbon standards for vehicles and gas cans will together reduce total emissions of MSATs by 330,000 tons in 2030, including 61,000 tons of benzene. As a result of this rule, new passenger vehicles will emit 45 percent less benzene, gas cans will emit 78 percent less benzene, and gasoline will have 38 percent less benzene overall. In addition, the hydrocarbon reductions from the vehicle and gas-can standards will reduce volatile organic compound (VOC) emissions (which are precursors to ozone and can be precursors to $PM_{2.5}$) by over 1 million tons in 2030. The vehicle standards will reduce direct $PM_{2.5}$ emissions by 19,000 tons in 2030 and could also reduce secondary formation of $PM_{2.5}$. Once the regulation is fully implemented, EPA estimates that these PM reductions will prevent nearly 900 premature deaths annually.



Source: U.S. Environmental Protection Agency. MOBILE6.2 Model run 20 August 2009

Figure 12. National MSAT emission trends 1990–2050 for vehicles operating on roadways using EPA's MOBILE6.2 Model

X. Summary and Conclusions

Based on the evaluation of the existing conditions within the study area, additional research, analysis, coordination, and/or permitting will be required before construction of the proposed parkway and will take place during the design phase. This section provides a summary of findings and identified constraints and recommendations for further study and analysis.

A. Cultural Resources

Research indicates approximately 15 percent of the study area has been previously surveyed for cultural resources; however, 12 of the 22 surveys were conducted before 2000 and may not meet current ASM, State Historic Preservation Office, and other professional standards for site recording and reporting; as such, it is likely that they may require new survey. The research also resulted in the identification of five cultural resources sites within the study area, including two historic roads, two historic prospects, and one prehistoric lithic scatter. A historic road has been recommended eligible for inclusion in the NRHP under Criterion A, and the lithic scatter, has been recommended NRHP eligible under Criterion D. The other three sites were previously recommended not eligible for listing in the NRHP.

Based on the results of the background research, additional Class III survey would be necessary in order to better assess the presence of cultural resources that may be affected by development of the study area.

Whether the survey is designed to sample proposed alternatives or is restricted to the preferred/recommended alternative, all cultural resources within the project's area of potential effect should be assessed and evaluated for NRHP eligibility. All cultural resources determined eligible for inclusion in the NRHP should be avoided by project activities; cultural resources of undetermined eligibility should be treated as eligible and avoided by project activities, if possible. If avoidance of NRHP-eligible sites is not possible, it is recommended that an appropriate program for eligibility testing and phased data recovery be designed and implemented, and an appropriate agreement document establishing a protocol for the resolution of adverse effects on historic properties be prepared and executed for this project.

B. Natural Resources

The majority of the study area is located within relatively undisturbed Sonoran Desertscrub vegetation. This vegetation supports numerous species of plants and wildlife that are likely to be impacted by project activities. The study area does not contain suitable habitat for any threatened or endangered species included on the USFWS list, and no proposed or designated critical habitat as listed under the Endangered Species Act occurs. The northern third of the study area contains suitable habitat for the Sonoran desert tortoise and the California leaf-nosed bat, which are sensitive species. Coordination with the USFWS, AGFD and BLM regarding listed and species of concern should occur as the project is further developed. Pre-construction surveys for Sonoran desert tortoise may be necessary within the northern portion of the study area. Numerous species of wildlife use the Hassayampa River corridor for forage as well for movement. In addition, wildlife is drawn to the Hassayampa River due to the presence of food and water following precipitation. As the Hassayampa River, the White Tank-Vulture/Hieroglyphic Mountains wildlife linkage corridor, and CAP canal are major wildlife movement areas; avoidance of these areas is recommended. New road construction in the study area is likely to result in habitat loss, increased habitat fragmentation, decreased connectivity for wildlife, and increased wildlife/vehicle collisions. Fragmentation and isolation of wildlife habitats and populations leads to:

- Decreased colonization and/or exchange between local wildlife populations
- Reduced population sizes
- Reduced genetic diversity
- Reduced species diversity and abundance
- Local extirpations

Roadways have the potential for direct mortality (i.e., roadkill) and habitat loss and to impede the movement of wildlife across the landscape, resulting in habitat fragmentation and the isolation of wildlife populations. Coordination with the AGFD to address potential impacts and explore the possibility of wildlife crossing structures or fencing options to maintain wildlife connectivity is recommended.

C. Land Use and Socioeconomics

Land within the study area is under management by government agencies or is privately owned. Some development has already occurred in the northern and southern portions of the study area and most of the study area below Whispering Ranch is anticipated to be developed with master planned communities. No commercial and only a few industrial uses are currently within the study area. Based on existing conditions, considerations to be made when identifying the potential corridor for the Hidden Waters Parkway should include environmental justice and potential Section 4(f) resources.

Environmental justice populations (elderly and disabled) occur in greater number within the northern half of the study area than in Maricopa County and the town of Buckeye. Some general types of impacts such as

acquisition of new right-of-way, increased noise levels, and community continuity are likely with the development of a new transportation corridor. It will be necessary for the future NEPA evaluation to address any potential disproportionate adverse effects on these populations as required by Title VI of the Civil Rights Act of 1964 and Executive Order 12898.

The study area includes numerous planned parks, trails and recreation areas. In addition, a cultural resource potentially eligible under Criterion A is present within the study area. Evaluation under Section 4(f) of the Department of Transportation Act of 1966 (23 USC § 138) will be required for parks, trails, recreational areas, and properties eligible or listed under Criteria A, B, or C. These cultural and recreational resources are potential Section 4(f) resources. Once a corridor is identified, if a constructive or actual use of these or other Section 4(f) resources is anticipated to occur, then a Section 4(f) evaluation will be necessary.

D. Visual Resources

If the BLM land within the study area is included in the chosen alignment for the development of the Hidden Waters Parkway, visual impacts resulting from the introduction of a transportation corridor to this area will need to be assessed. No VRM Class I areas occur within the project area. In Class II, III, and IV areas, the proposed Hidden Waters Parkway would be consistent with the management objectives with varying levels of mitigation or design effort to minimize the visual impact of the road. In Class II areas, the design should consider siting and location and repeat the form and line of the existing characteristic landscape to minimize impact. Coordination with the BLM with regard to potential impacts and proposed mitigation measures would take place during future NEPA analysis to ensure that the BLM visual resource management objectives are adequately considered and addressed.

E. Water Resources

The Hassayampa River and a total of five named and 14 unnamed ephemeral washes occur within the study area, all of which may be considered waters of the United States. It is not anticipated that wetlands or other special aquatic sites would be impacted by the project. No unique or impaired waters designated by the EPA or the ADEQ are located within or in the vicinity (i.e., 1.0 mile) of the area of potential affect. A Section 404 Nationwide Permit No. 14 (Linear Transportation Projects) or a Section 404 Individual Permit will be required for the proposed improvements contingent on the extent of excavation and fill within waters of the US required for roadway and drainage improvements. Section 401 certification for the project will be issued by the ADEQ and will be either conditional or individual based on the type of Section 404 permit necessary.

F. Hazardous Materials

Several sites have been identified within and adjacent to the study area. Additional investigation of hazardous materials is recommended for this study area and the surrounding area to identify the potential for impacts on soil and groundwater resulting from past and current land uses.

G. Noise

Noise receivers occur in the residential developments in the northern and southern end of the study area. Additional receivers will be introduced throughout the study area with the development of the planned master planned communities and regional park. An evaluation of future noise levels compared to the existing noise levels will be needed to determine any necessary noise mitigation measures in compliance with MCDOT Noise Abatement Policy requirements, as well as FHWA if federal funds are involved.

H. Air Quality

The study area is within the Maricopa nonattainment area for O_3. Transportation control measures in the SIPs and FIPs will apply. The project will need to be included in an approved STIP for at least one year, and no more than three years, before construction. That STIP will have to be approved by FHWA and EPA as conforming to the SIP and the FIP. Future transportation improvements will also follow to the extent possible recommendations given by the MAG Regional Transportation Plan, a plan to ensure that the additional roadway does not cause or contribute to new violations of the air quality standards and assists in the conformity of the existing air quality improvement plans.

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APPENDIX. USFWS AND AGFD SPECIES LISTS AND AGENCY CORRESPONDENCE

U.S. FISH AND WILDLIFE SERVICE SPECIES LIST FOR MARICOPA COUNTY

List of threatened, endangered, proposed, and candidate species potentially occurring in Maricopa County

Common Name	Scientific Name	Status[a]
Arizona cliffrose	*Purshia subintegra*	LE
Bald eagle	*Haliaeetus leucocephalus*	LT
California least tern	*Sterna antillarum browni*	LE
Desert tortoise, Sonoran population	*Gopherus agassizii*	C
Desert pupfish	*Cyprinodon macularius*	LE
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	LE
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	LE
Mexican spotted owl	*Strix occidentalis lucida*	LT
Mountain plover	*Charadrius mountanus*	PT
Razorback sucker	*Xyrauchen texanus*	LE
Roundtail chub	*Gila robusta*	C
Sonoran pronghorn	*Antilocapra Americana snoriensis*	LE
Southwestern willow flycatcher	*Empidonax traillii extimus*	LE
Sprague's pipit	*Anthus spragueii*	C
Tucson shovel-nosed snake	*Chionactis occipitalis klauberi*	C
Woundfin	*Plagopterus argentissimus*	LE
Yellow-billed cuckoo	*Coccyzus americanus*	C
Yuma clapper rail	*Rallus longirostris yumanensis*	LE

Source: US Fish and Wildlife Service list of threatened, endangered, proposed, and candidate species potentially occurring in Maricopa County, http://www.fws.gov/southwest/es/arizona/, accessed March 9, 2011.

[a]Status definitions: LE = listed endangered, LT = listed threatened, PT = proposed threatened, C = candidate

Arizona's On-line Environmental Review Tool
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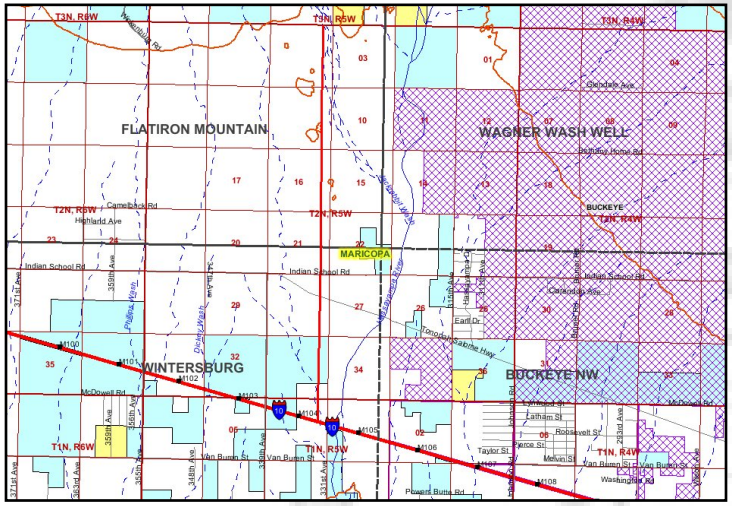
Project Name: Hidden Waters south
Date: 3/14/2011 12:46:08 PM

Project Location



Project Name: Hidden Waters south
Submitted By: Heather English
On behalf of: MARICOPA
Project Search ID: 20110314014619
Date: 3/14/2011 12:46:02 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 335808.277, 3704097.952 meter
Project Length: 10246.985 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1287
Quadrangle Name: WINTERSBURG
Project locality is currently being scoped

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

No special status species were documented as occurring within the project vicinity. However, further field investigations of the project area are highly recommended. Site visits may reveal previously unrecorded resources of special concern in locations where they are currently undocumented.

No proposed or designated critical habitat is within the project vicinity.

No Indian tribal lands are within the project vicinity.

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

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Fax 928-226-1099

Disclaimer:

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Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

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During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants http://www.azda.gov/PSD/quarantine5.htm. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: http://www.usda.gov/wps/portal/usdahome. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important

 APPLICATION INITIALS: _____

wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

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Planning: consider impacts of lighting intensity on mammals and birds and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use.

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7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

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By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was

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developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
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Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

 APPLICATION INITIALS: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

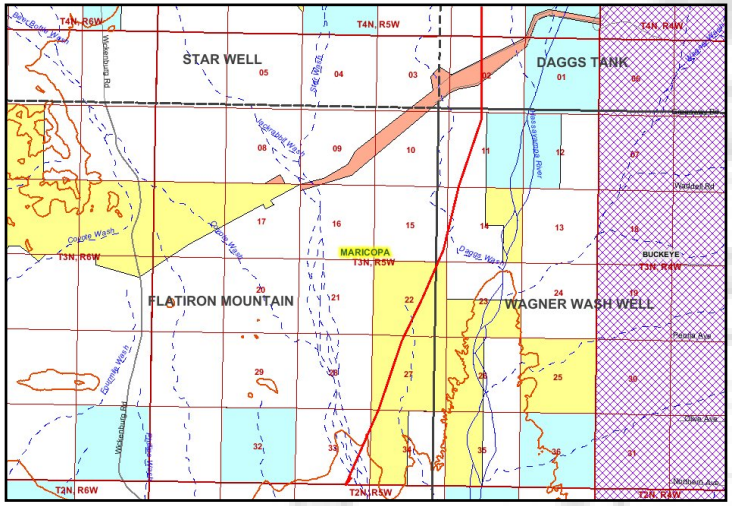
Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20110314014622
Project Name: Hidden Waters middle
Date: 3/14/2011 12:55:00 PM

Project Location



Project Name: Hidden Waters middle
Submitted By: Heather English
On behalf of: MARICOPA
Project Search ID: 20110314014622
Date: 3/14/2011 12:54:55 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 337652.274, 3719808.934 meter
Project Length: 11044.733 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1243
Quadrangle Name: WAGNER WASH WELL
Project locality is currently being scoped

Location Accuracy Disclaimer

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The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

No special status species were documented as occurring within the project vicinity. However, further field investigations of the project area are highly recommended. Site visits may reveal previously unrecorded resources of special concern in locations where they are currently undocumented.

No proposed or designated critical habitat is within the project vicinity.

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 APPLICATION INITIALS: _____

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Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

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Contact Name: _____

 APPLICATION INITIALS: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

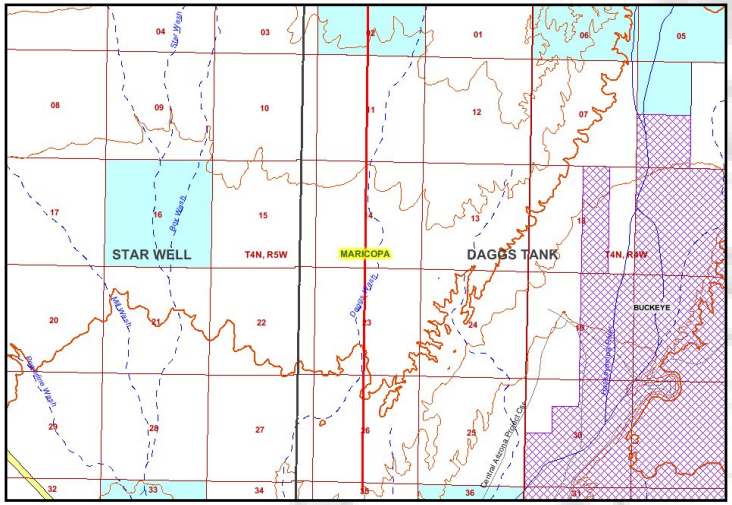
Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20110314014623
Project Name: Hidden Waters middle north
Date: 3/14/2011 12:59:50 PM

Project Location



Project Name: Hidden Waters middle north
Submitted By: Heather English
On behalf of: MARICOPA
Project Search ID: 20110314014623
Date: 3/14/2011 12:59:45 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 338772.969, 3728613.518 meter
Project Length: 7327.708 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1198
Quadrangle Name: DAGGS TANK
Project locality is currently being scoped

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Flagstaff, AZ 86001
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Fax 928-226-1099

Disclaimer:

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2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
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Arizona Game and Fish Department Mission

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 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads

Project Type Recommendations:

All degraded and disturbed lands should be restored to their natural state. Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (http://www.spl.usace.army.mil/regulatory/phonedir.html)

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants http://www.azda.gov/PSD/quarantine5.htm. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: http://www.usda.gov/wps/portal/usdahome. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important

wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Hydrological considerations: design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Aquatic wildlife considerations: reduce/minimize barriers to migration of amphibians or fish (e.g. eliminate falls). Terrestrial wildlife: washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise, while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Guidelines for culvert designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

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Planning: consider impacts of lighting intensity on mammals and birds and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use.

Preconstruction - Consider design structures and construction plans that minimize impacts to channel geometry (i.e. width/depth ratio, sinuosity, allow overflow channels) to avoid alteration of hydrological function. Identify whether wildlife species use the structure for roosting or nesting during anticipated construction period. Plan the timing of construction/maintenance to minimize impacts to wildlife species. In addition to the species list generated by the Arizona's On-line Environmental Review Tool, the Department recommends that surveys be conducted at the bridge and in the vicinity of the bridge to identify additional or currently undocumented bat, bird, or aquatic species in the project area. To minimize impacts to birds and bats, as well as aquatic species, consider conducting maintenance and construction activities outside the breeding/maternity season (breeding seasons for birds and bats usually occur spring - summer). Examining the crevices for the presence of bats prior to pouring new paving materials. When bats are present, the top of the crevices should be sealed to prevent material from dripping or falling through the cracks and potentially onto bats. If bats are present, maintenance and construction (including paving and milling) activities should be conducted during nighttime hours, if possible, when the fewest number of bats will be roosting. Consider incorporating roosting habitat for bats into bridge designs. Minimize impacts to the vegetation community. A revegetation plan should be developed to replace impacted communities. Unavoidable impacts to vegetation should be mitigated on-site whenever possible. During construction: Erosion control structures and drainage features should be used to prevent introduction of sediment laden runoff into the waterway. Minimize instream construction activity. If culverts are planned, mitigate impacts to wildlife and fish movement. Guidelines for bridge designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

 APPLICATION INITIALS: _____

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Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches.

Recommendations Disclaimer:

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6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

Terms of Use

By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was

 APPLICATION INITIALS: _____

developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
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Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

 APPLICATION INITIALS: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

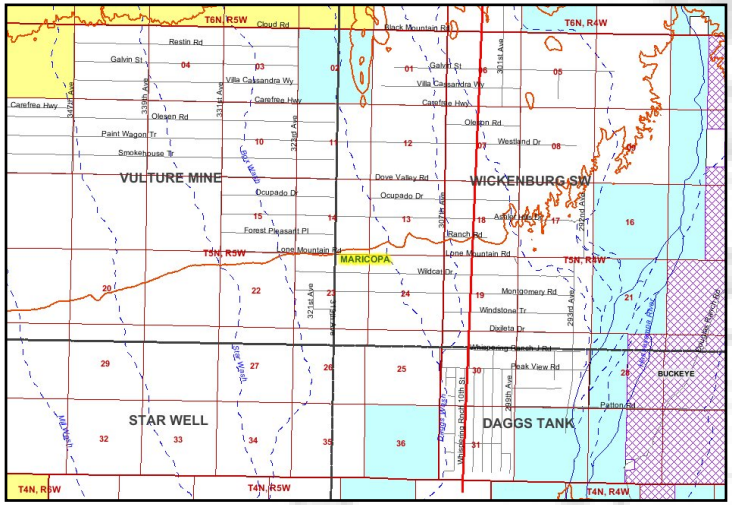
Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20110314014625
Project Name: Hidden Waters north
Date: 3/14/2011 1:05:21 PM

Project Location



Project Name: Hidden Waters north
Submitted By: Heather English
On behalf of: MARICOPA
Project Search ID: 20110314014625
Date: 3/14/2011 1:05:15 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 340902.362, 3737887.972 meter
Project Length: 10492.936 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1198
Quadrangle Name: DAGGS TANK
Project locality is currently being scoped

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The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
Gopherus agassizii (Sonoran Population)	Sonoran Desert Tortoise	C	S	S	WSC
Macrotus californicus	California Leaf-nosed Bat	SC	S	S	WSC
Myotis velifer	Cave Myotis	SC			

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

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Project Location and/or Species recommendations:

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:
Ecological Services Office
US Fish and Wildlife Service
2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

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Arizona Game and Fish Department
5000 West Carefree Highway

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Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

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Signature:_____

Date: _____

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 APPLICATION INITIALS: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

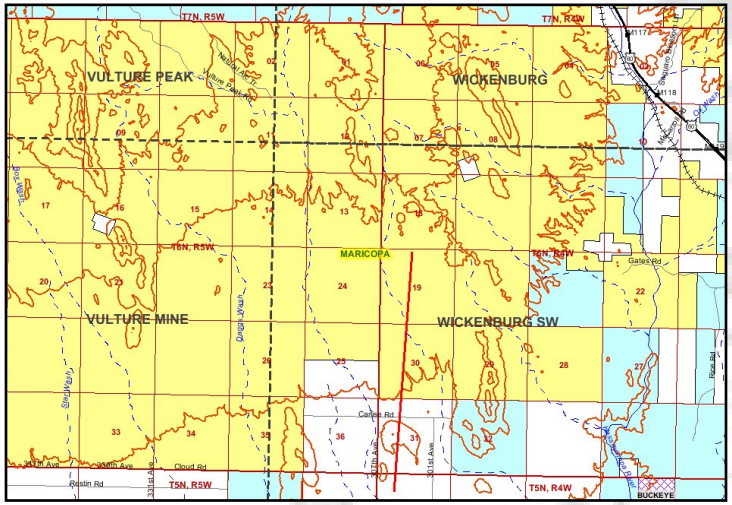
Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20110314014626
Project Name: Hidden Waters far north
Date: 3/14/2011 1:08:21 PM

Project Location



Project Name: Hidden Waters far north
Submitted By: Heather English
On behalf of: MARICOPA
Project Search ID: 20110314014626
Date: 3/14/2011 1:08:15 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 340926.857, 3744746.447 meter
Project Length: 5175.047 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1153
Quadrangle Name: WICKENBURG SW
Project locality is currently being scoped

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
Bat Colony					
Gopherus agassizii (Sonoran Population)	Sonoran Desert Tortoise	C	S	S	WSC
Macrotus californicus	California Leaf-nosed Bat	SC	S	S	WSC
Myotis velifer	Cave Myotis	SC			
Wickenburg - Hassayampa Linkage Design	Wildlife Corridor				

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2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads

Project Type Recommendations:

All degraded and disturbed lands should be restored to their natural state. Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (http://www.spl.usace.army.mil/regulatory/phonedir.html)

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants http://www.azda.gov/PSD/quarantine5.htm. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: http://www.usda.gov/wps/portal/usdahome. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important

 APPLICATION INITIALS: _____

wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Hydrological considerations: design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Aquatic wildlife considerations: reduce/minimize barriers to migration of amphibians or fish (e.g. eliminate falls). Terrestrial wildlife: washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise, while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Guidelines for culvert designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Planning: consider impacts of lighting intensity on mammals and birds and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use.

Preconstruction - Consider design structures and construction plans that minimize impacts to channel geometry (i.e. width/depth ratio, sinuosity, allow overflow channels) to avoid alteration of hydrological function. Identify whether wildlife species use the structure for roosting or nesting during anticipated construction period. Plan the timing of construction/maintenance to minimize impacts to wildlife species. In addition to the species list generated by the Arizona's On-line Environmental Review Tool, the Department recommends that surveys be conducted at the bridge and in the vicinity of the bridge to identify additional or currently undocumented bat, bird, or aquatic species in the project area. To minimize impacts to birds and bats, as well as aquatic species, consider conducting maintenance and construction activities outside the breeding/maternity season (breeding seasons for birds and bats usually occur spring - summer). Examining the crevices for the presence of bats prior to pouring new paving materials. When bats are present, the top of the crevices should be sealed to prevent material from dripping or falling through the cracks and potentially onto bats. If bats are present, maintenance and construction (including paving and milling) activities should be conducted during nighttime hours, if possible, when the fewest number of bats will be roosting. Consider incorporating roosting habitat for bats into bridge designs. Minimize impacts to the vegetation community. A revegetation plan should be developed to replace impacted communities. Unavoidable impacts to vegetation should be mitigated on-site whenever possible. During construction: Erosion control structures and drainage features should be used to prevent introduction of sediment laden runoff into the waterway. Minimize instream construction activity. If culverts are planned, mitigate impacts to wildlife and fish movement. Guidelines for bridge designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

 APPLICATION INITIALS: _____

Recommendations will be dependant upon goals of the fence project and the wildlife species expected to be impacted by the project. General guidelines for ensuring wildlife-friendly fences include: barbless wire on the top and bottom with the maximum fence height 42”, minimum height for bottom 16”. Modifications to this design may be considered for fencing anticipated to be routinely encountered by elk, bighorn sheep or pronghorn (e.g., Pronghorn fencing would require 18” minimum height on the bottom). Please refer to the Department's Fencing Guidelines located at http://www.azgfd.gov/hgis/guidelines.aspx.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly.

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches.

Project Location and/or Species recommendations:

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:
Ecological Services Office
US Fish and Wildlife Service
2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

HDMS records indicate your project is in or near an identified wildlife habitat linkage corridor. Project planning and implementation efforts should focus on maintaining adequate opportunities for wildlife permeability. For information on the linkage assessment and wildlife species that may be affected refer to: http://www.corridordesign.org/arizona. Contact your Arizona Game and Fish Department Regional Office for specific project recommendations: http://www.azgfd.gov/inside_azgfd/agency_directory.shtml

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department’s review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative,**

 APPLICATION INITIALS: _____

acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

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4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

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This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information

 APPLICATION INITIALS: _____

provided.

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

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THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV
REGION IV, 9140 E. 28TH ST., YUMA, AZ 85365

May 10, 2011

Matt Truitt
EPS Group, Inc.
2045 S. Vineyard Ave.
Suite 101
Mesa, Arizona 85201

Re: Hidden Waters Parkway North Corridor Feasibility Study: Interstate 10 to Route 74

Dear Mr. Truitt:

The Arizona Game and Fish Department (Department) has reviewed the March 2011 Hidden Waters Parkway North Corridor Feasibility Study: Interstate 10 to Route 74. Given the description and our understanding of planned activities, we are providing the following comments for your consideration.

Project Description
According to the draft work plan, the Hidden Waters Parkway North Corridor Feasibility study area starts from Interstate 10 (I-10) north to the future alignment of State Route 74 (SR74) and is approximately 28 miles long and 2 miles wide. This proposed project is intended to help Maricopa County meet future traffic demands in northwest Maricopa County.

Conservation Issues
Due to the location of this parkway, the Department has concerns about the impacts it may have on local wildlife. First, in the Department's Heritage Data Management System (HDMS), the Sonoran desert tortoise (*Gopherus agassizii*), California leaf-nosed bat (*Macrotus californicus*), and cave myotis (*Myotis velifer*) are listed as potentially occurring within or near the northern portion of the project location. The Sonoran desert tortoise and the California leaf-nosed bat are listed as Wildlife of Special Concern in Arizona by the Department, but the Sonoran desert tortoise is also listed as a candidate species for listing as threatened under the Endangered Species Act. The cave myotis is also listed as a Species of Concern by the U.S. Fish and Wildlife Service.

First, the study area for the parkway crosses the Central Arizona Project (CAP) canal and several large washes such as Jackrabbit Wash. The canal is often a barrier to wildlife because of the limited ability different species have in crossing it. As a result, the canal incidentally directs wildlife movement along it, and the Department and other stakeholders have identified CAP-adjacent lands as potential wildlife linkages critical to preserve as natural habitat within the context of future urban, rural, transportation and energy development (enclosure; linkage 152). The desert washes the parkway will cross are also frequently used by wildlife as a travel corridor (Henke et al. 2001). The construction of a road designed for high volume traffic will act as an additional barrier and further restrict movement and fragment

habitat along the canal and washes resulting in increased habitat fragmentation and isolation, and ultimately the decline and possible disappearance of local wildlife populations (Alexander et al. 2005; Clark et al. 2010). The parkway will come within close proximity of another wildlife linkage (Linkage 51) in the northern portion of the project location. Potential wildlife linkages were, and continue to be identified through collaborative processes with various stakeholders as part of the *Arizona's Wildlife Linkages Assessment* (Nordhaugen et al. 2006) and subsequent workshops in various counties throughout Arizona.

Since the 2006 linkage planning effort the Department has continued to develop linkage goals for the White Tank Mountains that address connectivity to surrounding wildland blocks, in addition to the Hassayampa River corridor. Linkages should accommodate connectivity between wildlands that support naturally reproducing populations of local wildlife. Connectivity between the White Tanks and the Hassayampa River corridor (identified in 2006 as Linkage 65) would not achieve this goal. Efforts are underway to finalize a fine-scale linkage design utilizing wildlife movement data (Grandmaison and Schweinsburg 2008) and computer modeling for this area. The draft linkage designs are enclosed as GIS shapefiles for use in maps and technical reports associated with this planning effort. They represent linkages between the White Tank, Belmont, and Vulture Mountains, in addition to the Hassayampa River Corridor. In the future a final linkage design and report will be available. The final linkage design will result in a smaller footprint than what the enclosed shapefiles represent.

The parkway may also be constructed within close proximity to the Hassayampa River. Its close proximity alongside the river will create a barrier to wildlife movement and reduce habitat availability due to an expected increase in human activity such as noise and ecological light pollution, and result in wildlife mortality due to vehicle collisions. Maintaining an appropriate distance to the river is important because noise has been identified as a barrier to movement by disturbing and repelling different species (Minton 1968; Liddle 1997). Also, the prevention of ecological light pollution along the river is important. Artificial lighting can alter the light-sensitive cycle of different species and impair an individual's ability to navigate through an area through disorientation from and attraction to that artificial light source (Beier 2006). The attraction of wildlife to artificial light sources varies by species, but it has been identified as a cause of decline in reptile populations (Perry and Fischer 2006).

Department Recommendations

The conservation and maintenance of wildlife linkages and desert washes could help maintain wildlife population connectivity through the area and hopefully serve to meet the needs of both wildlife conservation and transportation within the area. Therefore, the Department recommends building bridges, culverts, and other crossing structures to not only allow the free movement of wildlife through washes and along the canal, but to also maintain the washes' natural hydrology. Since the parkway will cross the CAP canal and Linkage 65, there is potential for wildlife vehicle collisions that would not only result in wildlife mortalities but also risk the safety of people. In order to avoid such incidents while maintaining critical wildlife connectivity along the canal and linkage, we recommend placing appropriate wildlife crossing structures at the CAP crossing and various locations throughout Linkage 65 to accommodate large mammals such as deer and coyotes. Crossing structures (for example, culvert, box culvert, bridge, or other as appropriate) should be built specifically to accommodate wildlife movement and utilize funnel fencing that is essential in guiding animals through. For more information

on building wildlife crossing structures, fencing, and their specifications, please review the attached guidelines or visit http://www.azgfd.gov/hgis/guidelines.aspx.

Successful preservation of all wildlife habitat linkages will require coordination of land use, transportation and flood control plans. The Department recommends analyzing impacts to all linkages within the feasibility analysis and including linkages within maps and published Technical Memos for the parkway, similar to what was done for the Turner Parkway Feasibility Study. The Department can provide the most up to date GIS data for your use and recommendations for locations and designs for roadway crossing structures within Linkage 65 as well.

Currently there are no lighting codes in Maricopa County for reducing ecological light pollution in order to avoid impacts on local wildlife. However, we recommend the following actions: 1) roadway lights should not be placed within close proximity to the Hassayampa River, wildlife crossing structures, wildlife linkages, and washes, 2) when driver and public safety is not a concern, light only high-risk stretches of roads, such as crossings and merges, allowing headlights to illuminate other areas, 3) keep the light fixture as low as possible to minimize light trespass, and use the lowest amount of illumination needed for the task, 4) direct lights down to the ground and not over wildlife habitat, and 5) fully shield the light so the bulbs are not visible to prevent light trespass.

In order to minimize Sonoran desert tortoise mortalities, we recommend that surveys be conducted prior to construction. If any tortoises are encountered, they should be moved outside the construction site within 1 mile of its original location. A scientific collecting permit is required for this activity. A permit can be obtained by emailing Scpermit@azgfd.gov. For more information on tortoise handling and survey guidelines, please review the attached guidelines or visit http://www.azgfd.gov/hgis/guidelines.aspx. The Bureau of Land Management (BLM) has requirements for the mitigation of lost Sonoran desert tortoise habitat on BLM land. For more information, please contact Codey Carter at codey_carter@blm.gov.

Thank you for the opportunity to provide comments on the Hidden Waters Parkway North Corridor Feasibility Study: Interstate 10 to Route 74. If you have any questions, please contact me at 928-341-4069.

Sincerely,

Tab Bommarito

Tab Bommarito
Habitat Specialist
Region IV, Yuma

cc: Pat Barber, Regional Supervisor, Region IV
Josh Avey, Chief, Habitat Branch
Troy Smith, Habitat Program Manager, Region IV
Leonard Ordway, Assistant Director, Field Operations
Codey Carter, Bureau of Land Management

AGFD # M11-05100536

Alexander, S.M., N.M. Waters, and P.C. Paquet. 2005. Traffic volume and highway permeability for a mammalian community in the Canadian Rocky Mountains. The Canadian Geographer. 49(4):321-331

Beier, P. 2006. Effects of artificial night lighting on terrestrial mammals. In. Rich, C., and Longcore, T. (eds) Ecological consequences of artificial night lighting. Island Press, Covelo, CA, pp 19-42.

Clark, R.W., W.S. Brown, R. Stechert, and K.R. Zamudio. 2010. Roads, interrupted dispersal, and genetic diversity in timber rattlesnakes. Conservation Biology. 24(4): 1059-1069

Grandmaison, D.D., and R.E. Schweinsburg. 2008. Mule deer movements in the White Tank Mountain Regional Park and Sun Valley Parkway corridor, Maricopa County, AZ: final report. Arizona Game and Fish Department, Research Branch, Phoenix, Arizona.

Henke, R.J., P. Cawood-Hellmund, and T. Sprunk. 2001. Habitat connectivity study of the I-25 and US 85 corridors, Colorado. Proceedings of the international conference on ecology and transportation.

Liddle, M. 1997. Recreational ecology: The ecological impact of outdoor recreation and ecotourism. Chapman and Hall, New York, NY, pp 639.

Minton, Jr. S.A. 1968. The fate of amphibians and reptiles in a suburban area. Journal of Herpetology 2:113-116.

Nordhaugen, S.E., E. Erlandsen, P. Beier, B.D. Eilerts, R. Schweinsburg, T. brennan, T. Cordery, N. Dodd, M. Maiefski, J. Przybyl, S. Thomas, K. Vacariu, and S. Wells. 2006. Arizona's Wildlife Linkages Assessment. The Arizona Wildlife Linkages Workgroup.

Perry, G., and R.N. Fisher. 2006. Night lights and reptiles: Observed and potential effects. In. Rich, C., and Longcore, T. (eds) Ecological consequences of artificial night lighting. Island Press, Covelo, CA, pp. 269-191.

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
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REGION VI, 7200 E. UNIVERSITY DRIVE, MESA, AZ 85207

May 20, 2011

Matt Truitt
EPS Group, Inc.
2045 S. Vineyard Ave.
Suite 101
Mesa, Arizona 85201

Re: Hidden Waters Parkway North Corridor Feasibility Study: Technical Memo No. 2 Environmental Overview

Dear Mr. Truitt:

The Arizona Game and Fish Department (Department) appreciates your continued coordination on the Hidden Waters Parkway North Corridor Feasibility Study. We have reviewed the Draft Technical Memorandum No. 2- Environmental Overview and have a few recommendations for revision in order to fully interpret the biological context of the planning area and findings. We also request inclusion of all Department correspondence in full as part of the Appendix.

Figure 2

The map does not include lands south of the White Tanks Mountain Regional Park that have been leased to the Town of Buckeye for development of the Buckeye White Tanks Regional Park by the BLM. These lands may eventually be purchased by the Town and the BLM will patent the lands over to the Town (BLM EA, Hassayampa Field Office). These lands represent a significant amount of open space adjacent to the White Tanks Regional Park that is also being conserved as open space. We recommend you update your map with the Buckeye White Tanks Regional Park designation. We can provide a copy of the EA if you need it.

III. Natural Environment – C. Wildlife and D. Sensitive Species and Habitats

We request inclusion of information provided in our May 10, 2011 correspondence in the Environmental Overview. The primary omissions that we see are:

- Section C- A few additional species to include with the list of species likely to be found in the project area are mule deer, mountain lion and kit fox.

- Section D- Discussion of linkage goals for the White Tank Mountains and reference to the fine-scale linkage designs that replace Linkage #65 as drawn in the 2006 Arizona Wildlife

Linkages Assessment. The Department has undertaken additional planning and design since the 2006 linkage assessment that realigns the linkage to the north based on wildlife movement research (mule deer and mountain lion) and habitat modeling. The new alignment is what the Department is actively pursuing for conservation with local area stakeholders. Additionally, the Department has initiated modeling for a linkage between the White Tank Mountains and the Vulture/Heiroglyphic Mountains. The conservation of these 2 linkages are critical to the future biological integrity of the White Tanks and the local conservation investments made as represented by the county and municipal parks. It is critical that all linkages are accurately represented in this planning document so that future planning anticipates and addresses connectivity needs within the parkway design and implementation phases. Focal species used for modeling these linkages include: desert tortoise, gila monster, lyre snake, tiger rattlesnake, mule deer, mountain lion, javelina, black-tailed jackrabbit, and kit fox.

- Illustrate all 3 linkages in Figure 6 that are currently in planning and could be affected by the parkway including: White Tank Mountains to Belmonts, White Tank Mountains to Vulture/Heiroglypic Mountains and the Wickenburg-Hassayampa linkage already illustrated. The Department can provide GIS data for all of 3 linkage designs if it has not been previously shared.

- Section D- Last sentence – The Department notes that the 2006 Linkage assessment was the beginning of an ongoing statewide effort to identify and model important areas for conserving as wildlife linkages in the future. Across the state linkage planning has continued at the county and local levels to develop linkage designs that are implementable. The Hassayampa River corridor was identified as a linkage within the Maricopa County linkage workshop. The reference to this document as the "formal" assessment is somewhat misleading and we recommend dropping that word.

X. Summary and Conclusions – B. Natural Resources and C. Land Use and Socioeconomics

Section B- The second to last sentence states that new road construction will result in habitat fragmentation and the isolation of wildlife populations, however these conclusions do not state why isolation is an issue. Please include the following statement after the aforementioned sentence.

Fragmentation and isolation of wildlife habitats and populations lead to:

- Decreased colonization and/or exchange between local wildlife populations
- Reduction of population sizes
- Reduced genetic diversity
- Reduced species diversity and abundance
- Local extirpations

Please note that road construction also results in habitat loss.

Section C- There appears to be no information regarding potential changes to road and trail networks that are currently used for access to public lands by the recreating public for activities such as hunting, hiking, camping or off-road vehicle recreation. The Department recommends

identification of any roads or trail networks that will could be impacted, as well as a discussion on mitigations or roadway design plans that will continue to facilitate recreation on public lands.

The Department looks forward to continued coordination and project planning. Thank you for the opportunity to provide comments on the Environmental Overview. If you have any questions, please contact me at 480-324-3547 or Tab Bommarito at 928-341-4069.

Sincerely,

Dana Warnecke

Dana Warnecke
Habitat Specialist
Region VI, Mesa

cc: Denise Lacey, Maricopa County Department of Transportation
Rod Lucas, Regional Supervisor, Region VI
Pat Barber, Regional Supervisor, Region IV
Laura Canaca, Project Evaluation Program Supervisor
Troy Smith, Habitat Program Manager, Region IV
Kelly Wolff-Krauter, Habitat Program Manager, Region VI

AGFD # M11-05172854