

**RECONNAISSANCE EVALUATION
AND
PROJECT MANAGEMENT PLAN
With an environmental evaluation.**

SPECIAL STUDY

**GILA RIVER AND TRIBUTARIES, TONTO CREEK
TONTO BASIN, GILA COUNTY, ARIZONA**



**US Army Corps
of Engineers**

Los Angeles District
South Pacific Division

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Many members of the Los Angeles District, U.S. Army Corps of Engineers assisted in the preparation of the Reconnaissance Evaluation and Project Management Plan (PMP) with an environmental evaluation, for the Tonto Creek Special Study, Tonto Basin, Gila County, Arizona. Primary team members familiar with the technical aspects of the project are:

PROJECT MANAGER: _____
Kim Gavigan

STUDY MANAGER: _____
Bryon Lake

HYDROLOGY AND HYDRAULICS: _____
Cuong Ly

SOCIOECONOMIC ANALYSIS: _____
Jeannine Hogg

ENVIRONMENTAL RESOURCES: _____
Chris Serjak

BIOLOGICAL ANALYSIS: _____
Gail Campos

CULTURAL RESOURCES: _____
Pam Maxwell

REAL ESTATE: _____
Steve Gale

STRUCTURAL ENGINEERING: _____
John Lei

CIVIL DESIGN: _____
Christopher Tu

COST ENGINEERING: _____
Juan Dominguez

GEOTECHICAL ENGINEERING: _____
Chris Sands

GIS and PUBLIC INVOLVEMENT: _____
Jeanine Divis



**US Army Corps
of Engineers**
Los Angeles District

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CONGRESSIONAL REQUEST SPECIAL STUDY

TONTO CREEK
TONTO BASIN, GILA COUNTY, ARIZONA

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1. INTRODUCTION

A. GENERAL INFORMATION

(1) Background. This Special Study is a Reconnaissance level evaluation to prepare a Project Management Plan, (PMP) for a Detailed Project Report (DPR). To clarify, the Project Management Plan (PMP) outlines what additional studies; evaluations and analyses would be required to complete a Detailed Project Report (DPR). A DPR is a Corps of Engineers decision document. Additionally, this document contains an environmental evaluation, which would be developed into the Environmental Impact Statement (EIS). An EIS would be required prior to any construction activity. The environmental evaluation presents an assessment of the conditions associated with the Local Alternatives proposed for a Bridge setting on Tonto Creek in Tonto Basin, Gila County Arizona. The Los Angeles District of the U.S. Army Corps of Engineers (the District) received Congressional Direction and Appropriation in November of 2003 to complete the evaluation and assessment of the local alternatives for a bridge setting on Tonto Creek. The report considers the three Congressional criteria provided by Arizona Congressional District 1, Congressman Renzi's Office. These criteria are, engineering feasibility, economic efficiency and environmental sensitivity. The District performed a field reconnaissance, with visits to the study area on April 9th and July 8th, 2004. The participants included staff from the Tonto Basin Ranger District, Gila County Flood Control, the Arizona Game and Fish Department's Habitat Branch, the U.S. Fish and Wildlife Service, the Congressional Liaison from Arizona District 1 and the Corps of Engineers. These groups visited each proposed bridge location and discussed the advantages, disadvantages, concerns, issues and opportunities associated with each location. The results of these discussions are captured in the Existing Baseline Conditions Section of this report.

(2) Study Authority. The Tonto Creek Special Study located in Tonto Basin, Gila County, Arizona, is undertaken through a Congressional Request to the U.S. Army Corps of Engineers, (COE) as a Special Study. The Congressional Direction and Appropriation to perform an evaluation and assessment of local alternatives for five potential bridge setting locations along Tonto Creek in Gila County, Arizona was provided in November 2003. This study is being conducted under the Congressional Authority the 1st Session, Conference Report 108-357 of the 108th Congress, to accompany House Resolution 2754, (HR 2754) dated 7 November 2003; under the General Investigations section of Title I, Department of Defense - Civil.

(3) Study Purpose and Scope of Work. This Special Study conducted a Reconnaissance level Evaluation and prepared a Project Management Plan (PMP) to complete a Detailed Project Report (DPR). The PMP contains an environmental evaluation as appendix A, which presents an assessment of the current environmental conditions in the study area in proximity to the local bridge setting location alternatives. From this evaluation, determination of the preliminary optimal placement location, considering engineering feasibility, cost effectiveness and that results in the least negative impacts to the environment. From the reconnaissance evaluation the future scopes of work and cost estimates were developed for the Corps to complete a Detailed Project Report (DPR) a Corps of Engineers Decision Document. This effort was completed in cooperation with the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service, Tonto Basin Ranger District (USFS), Arizona Game and Fish Department (AGFD), Gila County Emergency Services, Public Works and the Flood Control District and the Army Corps of Engineers staff. Included in the PMP, as appendix B is the Corps Hydrology and Hydraulics section review, evaluation and assessment of the 2004 HDR Hydrologic Analysis prepared for the Federal Emergency Management Agency- Region IX.

(4) Type and Detail of Investigations. This report summarizes the results of analyses and evaluation of previous local efforts and current conditions associated with planning, hydrology and hydraulics, engineering, economics, natural and cultural resources related to this Special Study. The study was conducted with sufficient detail to provide a reconnaissance level evaluation and assessment of local preliminary bridge design and setting location alternatives; considering economic efficiency, engineering feasibility and environmental sensitivity. The PMP outlines the scope and cost estimates for the Corps to complete a Detailed Project Report (DPR). This assessment of concerns and conditions was accomplished with participation from United States Fish and Wildlife Service (USFWS), Arizona Game and Fish Department (AGFD), United States Forest Service (USFS), Gila County Emergency Services, Public Works and Flood Control District and the Army Corps of Engineers, Los Angeles District. The Hydrologic Analysis for Tonto Creek and selected tributaries completed by HDR for the Federal Emergency Management Agency (FEMA) was evaluated by the Corps' Hydrology and Hydraulics (H&H) staff and compared to previous Hydrologic analyses, to include, the 1993 Engineering study from Federal Highway Administration (FHWA) for inclusion in the PMP. The Federal Highway Administration Report will be referred to regarding the preliminary setting location recommended with respect to H&H concerns and Engineering feasibility. An evaluation of the preliminary bridge design was completed and found to be adequate, cost estimates where derived by inflating the associated construction costs outlined in the 1993 Preliminary Engineering Study prepared by the Federal Highway Administration to costs consistent with construction in 2005.

(5) Study Area. Tonto Creek is a major surface watershed located in Gila County, Arizona. It extends from the Mogollon Rim, the top of the watershed, south to its confluence with the Salt River at Roosevelt Lake. The contributing drainage basin of Tonto Creek is approximately 955 square miles. The upper reaches are generally undeveloped with a principal cover of pine and juniper. The lower reaches contain some residential and business development; one

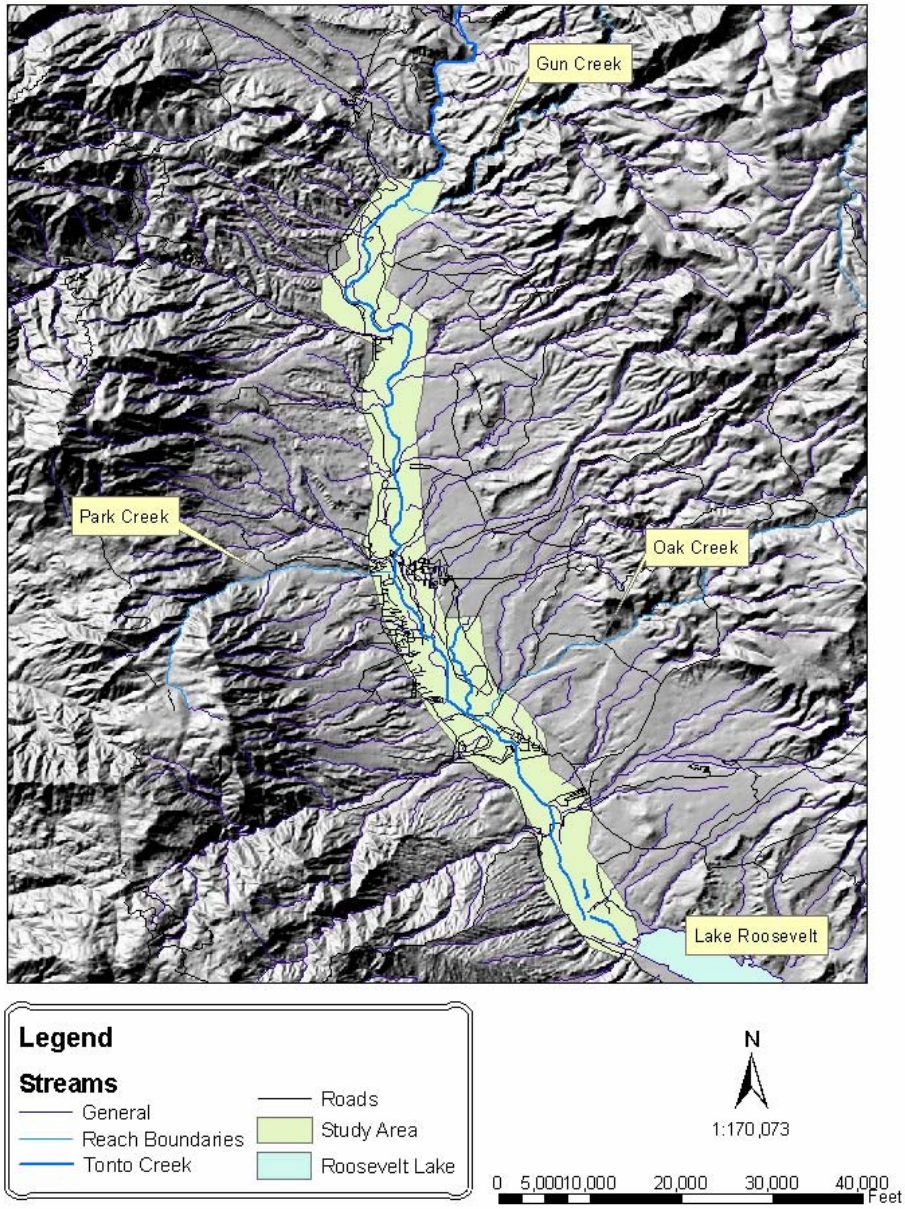
example is the community of Punkin Center, near Roosevelt Lake. The principal cover of the lower reaches consists of riparian obligate species (cottonwood/willow) and upper sonoran desert vegetation in over-bank areas. For the purpose of this study the Tonto Creek drainage basin will be divided into two main sections. The upper section is above the gauging station just north of the confluence of Gun Creek and Tonto Creek, approximately 675 square miles with a main channel length of 34.4 miles. The lower section is below this gauging station, north of the confluence of Gun Creek and Tonto Creek, to the confluence of Tonto Creek and the Salt River at Roosevelt Lake. This lower section is the focus of this study; it has a drainage area of 236.6 square miles and a main channel length of approximately 14 to 16 miles. The historic floodplain of Tonto Creek varies from approximately 2,000 feet to approximately 3,500 feet in width. During low flows Tonto Creek is braided with the main surface flow confined within two low flow channels. During high flows the creek stretches across the floodplain making passage across Tonto Creek impossible or, at least, extremely dangerous for all vehicular traffic. Low-lying areas, (residential and business properties) along Tonto Creek are subject to some level of inundation and the potential to experience floods. The Study Area map follows **(Figure 1)**.

(6) Prior Studies, Reports and Existing Water Projects. Studies and reports that are pertinent to this feasibility study include:

- a. *Preliminary Engineering Study, Tonto Creek.* Federal Highway Administration, Central Federal Lands Highway Division. June 1993.
- b. *Hydrologic Analyses, Tonto Creek and Selected Tributaries, Punkin Center to Theodore Roosevelt Lake.* For the Federal Emergency Management Agency – Region IX, by HDR, January 2004.
- c. *Flood Control Studies for Arizona Communities, Summary Report.* Los Angeles District, U.S. Army Corps of Engineers. August 1994.
- d. *Arizona Game and Fish Department's Heritage Data Base Management System.* Arizona Game and Fish Department
- e. *Annual Flood Damage and Assistance Reports, Gila County Emergency Services and Flood Control District.* 1990-2004.
- f. *Tonto Creek Riparian Unit Monitoring Study 1994 – 1998 Final Report.* Garcia and Associates for U.S. Bureau of Reclamation.

FIGURE 1

Tonto Creek Study Area



B. ASSESSMENT OF WATER AND LAND RESOURCE PROBLEMS AND OPPORTUNITIES.

(1) Study Area Background Description. The limit of the Study area is from the gauging station on Tonto Creek just north of the confluence of Gun and Tonto Creek and continues South, down stream to the Northwestern end of Roosevelt Lake. This reach has a drainage area of approximately 236.6 square miles and a main channel length of approximately 14 to 16 miles. The historic floodplain of Tonto Creek varies from approximately 2,000 feet to approximately 3,500 feet in width. The gauging station located on Tonto Creek, above its confluence with Gun Creek is approximately 8-miles north of Punkin Center (**Plate 1**). The station has been in existence for about 60 years and was the principle source of data used to compute the discharges for the 1993 Engineering Study completed by the Federal Highway Administration, (FHWA). A Log Pearson type III distribution was used to compute return flood frequencies at the gauging station.



Plate 1- USGS Gauging Station on Tonto Creek (The North boundary of the Study Area).

There are three primitive low water fords currently being used to cross Tonto Creek during low flows. The FHWA document refers to these fords as the “upper-crossing”, “middle-crossing” and “lower-crossing”. The upper crossing is located at Punkin Center; the middle crossing, known locally as the “Bar-X Road”, is located approximately 3.6 miles south of the upper crossing at Punkin Center; and the lower crossing, known locally as the “A-Cross Road”, is located approximately 2.7 miles south of the “Bar-X Road”. The lower crossing, the A-Cross Road will be

directly affected by the future operating pool elevation planned with the completion of the modifications to Roosevelt Dam. The new planned operating pool elevation for the reservoir will be 2,151 feet, this will inundate the existing lower crossing, the A-Cross Road which is approximately 2,146 feet. "*The Bureau of Reclamation intends to acquire all private property below elevation 2,180 to accommodate the proposed Roosevelt Lake 200-year flood stage of 2,175 feet*". (From the FHWA Preliminary Engineering Study, 1993)

Currently, the primary demand to cross Tonto Creek is by residents of the three subdivisions and the other property owners on the east side of Tonto Creek. The major developments along the east side are, at the upper crossing (Punkin Center ford), Rancho Del Escondido, at the middle crossing (Bar-X ford), Roosevelt Lake Gardens East subdivision and at the lower crossing (A-Cross ford), North Bay Estates subdivision. (Tonto Basin's estimated population is approximately 2,000.)

Winter and spring storms occurring from January to April can result in heavy flows on Tonto Creek, preventing vehicular traffic across Tonto Creek for 2 to 3 weeks at a time. During large flood events, road closures may extend to nearly a month, while in drier years the road closures total a few days annually. The uncertainty of safe access and the inconvenience resulting from the limited access significantly reduces developmental opportunities for Federal, State, County, Local Community and Private Land Owners along the east side of Tonto Creek. Significant flooding and extended closures were experienced in 1990, 1993 and September of 2003.

(a) Tonto Creek Study Reaches. The project study area will initially divide Tonto Creek into three separate study reaches. These may be further divided as the study progresses for the purpose of the Hydrology and Hydraulics, Wildlife and Ecological or Cultural Resource investigations. Reach 1, (Lower) includes Tonto Creek from its mouth at Roosevelt Lake North to the southern edge of the Roosevelt Lake Gardens East community, (approximately 4-miles to 4.75-miles dependant on the Lake level). Reach 2, (Middle) begins at north boundary of reach 1 and extends North up Tonto Creek to the confluence of Tonto and Park Creek, just South of Punkin Center, (approximately 4.75-miles). Reach 3 (Upper) begins at the confluence of Tonto and Park Creek, the North boundary of Reach 2 and extends North to the gauging station just North of the confluence of Tonto and Gun Creek at the study areas North most boundary, (approximately 8 to 8.5-miles) North of the community of Punkin Center. Each reach contains one of the three fords for Tonto Creek, several side tributaries to Tonto Creek and developed areas containing a number of structures on either side of Tonto Creek. The 200-Year Flood Stage Elevation of 2175 feet shows the inundated crossing area for Tonto Creek varying from approximately one-half to three-quarters of a mile across.

(2) Existing Baseline Conditions.

a. General Background: The Baseline Conditions of the Study Area were derived during two interagency field reconnaissance visits to Tonto Creek on 9 April 2004 and on 8 July 2004. The following is a summary of comments and views of the participants as observed on the field outings. The baseline condition descriptions are separated into five paragraphs in order to describe the existing conditions present at the five proposed bridge setting locations. *The following*

items require consideration throughout the study area: the high potential of Cultural resources occurring at any of the five proposed bridge setting locations. The U.S. Fish and Wildlife Service is waiting on the completion of the appeals process before making a final decision on the persistence of Spikedace (*Meda flugida*) and Loach minnow (*Rhinichthys = (Tiaroga) cobitis*) critical habitat in Tonto Creek. The Heritage Data Management System developed by the Arizona Game and Fish Department also documents the following native fish species that have the potential to be negatively impacted by the proposed bridge: *Agosia chrysogaster*, *Catostomus clarki*, *Catostomus insignis*, *Gila robusta*, *Poeciliopsis occidentalis occidentalis* and *Rhinichthys osculus*. The Tonto Creek riparian corridor is used by many riparian obligate avian species for breeding, foraging and migration; however, some of the most sensitive are the federally-listed southwestern willow flycatcher (*Empidonax traillii extimus*), Bald Eagle (*Haliaeetus leucocephalus*), and Yuma Clapper Rail (*Rallus longirostris yumanensis*), and the candidate yellow-billed cuckoo (*Coccyzus americanus occidentalis*). The United State Forest Service (USFS) Tonto Basin Ranger District has a policy to box and relocate Barrel Cactus (*Fernocactus* spp.), Ocotillo's (*Fouquieria splendens*) and Saguaro's (*Carnegiea gigantea*) that would be subject to loss within the proposed construction corridor. We will refer to this relocation effort as BOS mitigation, for Barrel, Ocotillo and Saguaro mitigation. The final consideration is the potential to close or rehabilitate one or more of the existing low-water crossings that would be less useful upon completion of the bridge.

Gun Creek (additional site No. 1) existing conditions: An additional bridge setting location proposed by Gila County. In this location Tonto Creek narrows as a result of a Metamorphic intrusion of Schist (sch), the rest of the drainage is designated as Sedimentary Rock, gravel, sand and silt (QTs). This location currently supports some willows (*Salix* spp.), cottonwood (*Populus* spp.), seep willow/broom bush (*Baccharis* spp.), along with other riparian obligate species. The terraces and over-bank areas exhibit mesquite (*Prosopis* spp.), graythorn (*Ziziphus* spp.), Acacia (*Acacia* spp.) and some Hackberry (*Celtis* spp.). The entire riparian corridor is utilized by a wide variety of wildlife species. While southwestern willow flycatchers and bald eagles may currently use this area for migration and/or foraging, it is not a current known nesting location for either species. Of the five bridge alternatives, the Gun Creek location is the furthest from any currently known nesting areas.

Advantages include:

- minimal impacts to riparian habitat
- a short expanse for the bridge
- abutment features on both sides
- a mid-slope alignment proposed
- no private land issues.

Disadvantages include:

- furthest from the population center
- the need for new road alignment(s)
- steep slopes for approach cuts
- the Saguaro stand on the slope
- additional low water crossings on small tributaries of new road alignment(s)
- creation of a 1-mile or more of new road through Tonto National Forest in undisturbed upper Sonoran Desert habitat.
- the presence of permanent water.

“Kayler Crossing” (additional site No. 2) existing conditions: An additional bridge setting location proposed by Gila County. This location is geologically designated as Sedimentary Rock, gravel, sand and silt (QTs). The existing habitat of this location is minimal and of marginal quality due to repeated disturbance in the channel, on terraces and over-bank areas (primarily cockleburs (*Xanthium saccharatum*)). The entire riparian corridor is utilized by a wide variety of wildlife species. While southwestern willow flycatchers and bald eagles may currently use this area for migration and/or foraging, it is not a current known nesting location for either species. Of the five bridge alternatives, the Gun Creek location is the furthest from any currently known nesting areas.

Advantages include:

- a short expanse for the bridge
- closer proximity to the population center
- reduced distance of alignments
- existing F.S. roads on the eastside
- minimal impact to fish and wildlife resources due to conveyance channel disturbance activities of the private landowner (the Brown Family)
- the project could provide opportunities to realize some environmental benefits by reshaping the creek to a more natural profile.
- road alignment would be through partially disturbed or modified habitat
- BOS mitigation is reduced in this area as a result of repeated disturbance.

Disadvantages include:

- the high potential to encounter cultural resources
- the acquisition of private property; lands, easements, rights-of-way, removals and disposal (LERRDS)
- public opinion on acquisition of private lands
- the potential to accelerate development and increase human induced environmental stressors along Tonto Creek.

Upper Crossing (Punkin Center/Sheep’s) existing conditions: This location is geologically designated as Sedimentary Rock, gravel, sand and silt (QTs). This location is the locally preferred location for the bridge crossing. The riparian community in this area is healthy but showing signs of degradation and some loss in functionality. This location currently supports willows (*Salix* spp.), some cottonwoods (*Populus* spp.), broom bush (*Baccharis* spp.), along with hackberry (*Celtis* spp.) and sycamore (*Platanus Wrightii*) and other riparian obligate species. The conveyance channel appears to migrate between numerous braids; and current aggradation is raising the low-flow conveyance channel and the stream gradient. The U.S. Fish and Wildlife Service has confirmed occupancy of a new Bald Eagle nest known as the “Sheep nest” in this area, it would be approximately 1.25-miles downstream of the proposed bridge location.

Advantages include:

- close proximity to population center
- potential increase to property values
- accelerated development potential
- some existing disturbance here
- further from the “active use areas” of the Bald Eagle and Southwestern Willow Flycatcher compared to the remaining alternatives.

Disadvantages include:

- Increased bridge expanse
- increases construction costs
- potential to increase aggradation
- the potential to shift or increase flooding
- the potential to accelerate development and human induced environmental stressors along Tonto Creek.
- potential for approaches to increase flooding to the Mobile Home Park and other private property along both sides of Tonto Creek

Middle Crossing (Bar–X Road) existing conditions: This location is geologically designated as Sedimentary Rock, gravel, sand and silt (QTs). This location currently supports willows (*Salix* spp.) cottonwoods (*Populus* spp.), broom bush (*Baccharis* spp.), along with hackberry (*Celtis* spp.) and sycamore (*Platanus Wrightii*) and other riparian obligate species. occupied Southwestern Willow Flycatcher habitat; and the close proximity to the “active use area” for nesting and fledging for Bald Eagles. The U.S. Fish and Wildlife Service has confirmed occupancy of a new Bald Eagle nest known as the “Sheep nest” in this area, approximately 2.0-miles upstream of the proposed bridge location.

Advantages include:

- close proximity to population center
- a centralized location in the community
- existing alignments on both sides of Tonto Creek
- potential for land exchange or acquisition by the Forest Service to square boundaries or remove private holdings from sensitive high value riparian habitat
- potential increase to property values and accelerated development potential on the east side of Tonto Creek, more than 50% of the remaining undeveloped private property available for development is in this area

Disadvantages include:

- increased expense, nearly three-quarters of a mile in length
- increased construction costs
- increased channel dynamics
- potential to increase or a shift the potential flooding
- private property on both sides of Tonto Creek at the approach locations
- aggradation is raising the conveyance channel and the stream gradient
- the potential to accelerate development and increase human induced environmental stressors along Tonto Creek.
- potential to increase aggradation
- channel migrates, numerous braids

Lower Crossing (A-Cross Road) existing conditions: This location is geological designated as Sedimentary Rock, gravel, sand and silt (QTs). This location currently supports willows (*Salix* spp.) cottonwoods (*Populus* spp.), broom bush (*Baccharis* spp.), along with some hackberry (*Celtis* spp.) and sycamore (*Platanus Wrightii*) and other riparian obligate species. The entire riparian corridor is utilized by a wide variety of wildlife species. Southwestern willow flycatchers and bald eagles currently use this area for breeding, nesting and foraging. This location is the closest proximity to the “active use area” for nesting and fledging bald eagles and southwestern willow flycatchers.

Advantages include:

- close proximity to population center
- the potential for land exchange or acquisition by the Forest Service to square boundaries or remove private holdings from sensitive high value riparian habitat
- the potential increase to property values and accelerated development potential on the east side of Tonto Creek, more than 50% of the remaining undeveloped private property available for development is in this area

Disadvantages include:

- increased expense, over three-quarters of a mile in length
- increased construction costs
- increased channel dynamics
- the potential to increase or shift the potential flooding
- private property on both sides of Tonto Creek at the approach locations
- potential to increase aggradation
- channel migrates, numerous braids

- aggradation is raising the low-flow conveyance channel(s); the stream gradient is approximately $4/10^{\text{ths}}$ of 1% in this area
- the potential to accelerate development and increase human induced environmental stressors
- the proposed new elevation for the operating pool of the Roosevelt Lake reservoir is 2151 feet, this will put sections of the existing A-Cross road three to five feet under water.

C. ECONOMICS.

(1). Human Resources, Development and Economy. There are several small communities (primarily residential, recreation and retirement in nature), located within the study area along both the east and west banks of this 14-mile reach of Tonto Creek. These communities are accessed from State Route 188, which is the major transportation corridor through Tonto Basin. The following is a list of the communities within the study area along Tonto Creek, beginning with the community at the northern boundary of the study area. Punkin Center is located approximately 8-miles south (down stream) of the USGS gauging station, along the west bank of Tonto Creek, within close proximity to this location along the east bank of Tonto Creek is the Rancho Del Escondido community. South (down stream), of these locations along the west bank are the communities of Roosevelt Lake Gardens West and Riverside Acres. The final two communities are located along the east bank of Tonto Creek. Access is provided by the Bar-X and A-Cross fords, to the communities of Roosevelt Lake Gardens East and the North Bay Estates. More detail on these communities and additional analysis or evaluation will be completed to develop the Detailed Project Report, this would begin in Fiscal Year 2005 (FY-05), contingent on Congressional Authorization and Appropriation. Currently there are several developed areas that are within or in very close proximity to the floodplain. **(Plate 2).**



Plate 2- Punkin Center Mobile Home Park (East bank, Punkin Center ford)

(2). Floodplain Development. According to Gila County, this is one of the fastest growing areas in the County. Observations during the site visits confirmed that development is increasing throughout Punkin Center and Tonto Basin. Tonto Creek begins to show signs of aggradation approximately 1.5 to 2-mile south (down stream), of the USGS gauging station. There are several causes for the aggradation. The condition of the watershed is a result of land use and rangeland management, (Garcia and Associates, 1998). The soil condition assessment of the Tonto Creek watershed by the U.S. Forest Service rates the area overall "Unsatisfactory". The Lone Fire in 1996 burned a large extent of the upper watershed of most of the tributaries along the west side of Tonto Creek. The elimination of the vegetative cover in these tributaries has increased the amount of sediment delivered to Tonto Creek from these tributaries. The historical and continued land uses of the Tonto Creek watershed by cattle grazing would appear to be one of the more pervasive and long-term stressors to the environment and a significant contributor to the conditions observed today. Other likely cause is a decrease in the slope of the streambed as the new Tonto Creek delta develops. The eventual increase in the water surface elevation proposed for Theodore Roosevelt Lake will likely accelerate the decrease in slope of the Tonto Creek streambed.

(Plate 3).



Plate 3- Sand and Gravel Operation Upper Reach Tonto Creek.

(3). Specific Problems and Opportunities. The water resources problems considered are the potential for flash flooding from short duration high intensity thunderstorms frequently experienced during the summer monsoon season. Additionally, the potential for some flooding of residential and commercial properties that lay in close proximity and potentially within the floodplain. There are transportation issues and public health and safety concerns associated with these unprotected low-water crossings and the lack of a high-water crossing.

There are several transportation and public health and safety concerns. Twenty to thirty students living on the eastside of Tonto Creek are unable to reach the school during periods of high water. In the past, a military duce-and- a-half was used to transport these students across Tonto Creek to school during high flows. Additional concerns exist for those residents who need to cross Tonto Creek to go to work or need medical attention. The local Fire District has concerns with the ability to access and respond to the needs of the residents on the eastside of Tonto Creek with emergency equipment and apparatus during high flow events. There is also the consideration of expenditures during flood response operations undertaken by Gila County Emergency Services. The following table list Flood Emergency Response Costs and the associated Damage Report. (Table 1).

Table 1- Tonto Creek Emergency Response Costs and Associated Damage Reports.

Description	Date	Damage Report No.	Costs in Dollars
Tonto Creek Estates	1990	Survey Report 22220	\$11,858.00
Tonto Creek Estates	1990	Survey Report 22509	\$ 1,000.00
Emergency Dike, Gisela	1993	Survey Report 56165	\$ 8,800.00
Protective Measures County Wide*	1993	Survey Report 50064	\$ 4,000.00
Sheriff's Overtime*	1993	Survey Report 57371	\$45,000.00
Roosevelt Gardens East	1993	Survey Report 57710	\$36,367.00
Dike Replacement/Punkin Center	1993	Survey Report 57711	\$37,260.00
Gisela-Tonto Shores	1993	Survey Report 57712	\$59,522.00
Emergency Search and Rescue*	1993	Survey Report 57719	\$10,000.00
Man-Hours, Equipment, Supplies	2003		\$10,095.00
Total			\$223,902.00
* Pro-rated estimate			

Additional concerns with respect to water resource problems for consideration include; recent correspondence to discuss issues about disputed use of Tonto Creek water, Clean Water Act investigations, surface water diversion protests, water rights, and how the bridge would facilitate water use, and subsequently the impacts to Tonto Creek and the sensitive and listed species dependent on its resources. Other potential environmental impacts that may result from the bridge development are; impacts associated with increased and long-term water diversion, groundwater pumping, and commercial use of water resources from Tonto Creek. The theme behind these issues is that current surface and groundwater use from Tonto Creek is a significant stressor to the system and further use can be expected to cause further degradation and stress.

D. ENVIRONMENTAL SETTING AND NATURAL RESOURCES

(1) General: There are environmental problems and opportunities associated with the low water crossings. Some of these problems are: soil compaction; reduced water quality as a result of vehicular traffic and periodic maintenance and realignment; increased turbidity; disturbance and disruption of flows increasing environmental stress and providing recurrent opportunities for invasive species encroachment and expansion into this declining riparian ecosystem; and the impacts to fish and wildlife species. The following is a general characterization of the Environmental Setting and Natural Resources. A detailed environmental evaluation report is included in this document as appendix A.

Climate: Central Arizona, Tonto Basin is within the Central Highlands Water Province, as defined by the United States Geological Survey and is generally classified as Upland Sonoran Desert. Upland Sonoran Desert is characterized by a balanced distribution of summer and winter rainfall. Winters are generally mild, frost is common, but severe and hard freezes are generally uncommon. Summers are hot and dry, monsoon storms occur in July and August and provide the bulk of summer precipitation. The configuration of Tonto Basin makes it conducive to the development of intense thunderstorm activity. Mean monthly temperatures range from a daytime maximum of 60.5 °F in January to 101.9 °F in July; it is not uncommon to experience daytime highs of 110 °F to 118 °F during the months of June, July and August. The average annual temperatures is 81.3 °F. The average annual precipitation is 17.6 inches. The mean annual snowfall for Tonto Basin, Punkin Center Arizona is 1.0 inch Generally the bulk of this moisture is received in February.

Air and Noise Quality: The study area is principally located within a rural community comprised primarily of residential properties with some light industrial and commercial properties; therefore, existing air and noise quality is good.

Aquatic Community: This reach of Tonto Creek that comprises the study area has a drainage area of approximately 236.6 square miles and a main channel length of approximately 14 miles. The existing water quality of Tonto Creek is generally good. There are periods when the water quality deteriorates to fair or poor during periods of disturbance from sand and gravel operations and following large precipitation events. Additional, turbidity and reduced water quality also results from maintenance activities to the low-water crossings and the associated vehicular traffic (**Plate 4**).



**Plate 4- The A-Cross Road Low-water ford.
(Example of periodic decline in water quality as a result of low-water fords)**

Terrestrial Habitat and Wildlife: Vegetation located within the study area is comprised of riparian obligate species within and adjacent to the Tonto Creek conveyance corridor and the numerous tributaries to Tonto Creek. The terraces and over-bank areas are comprised of upland sonoran desert vegetation and desert wash vegetation in conjunction with a variety of succulents and cacti. Terrestrial wildlife species include but are not limited to; Whitetail Deer (*Odocoileus virginianus*), Mule Deer (*Odocoileus hemionus*), Javalina (*Tayassu tajacu*), Bobcat (*Felis rufus*), Coyote (*Canis latrans*), Raccoon (*Procyon lotor*), Ringtail cats (*Bassariscus astutus*), Rabbits (*Lagomorpha*), many Squirrels (*Sciuridae*), several Bat species (*Chiroptera*) a large variety of Avian species, Reptiles and Amphibians and numerous other rodents as well. Additional information on terrestrial habitat and wildlife can be located within the environmental evaluation (e.e.) included in this document as appendix A.

Threatened and Endangered Species: The following information was provided from the Arizona Game and Fish Department Heritage Data Management System. The following are special status wildlife documented within one mile of Tonto Creek, between its confluence with Gun Creek and Roosevelt Lake. The species that have the greatest potential to be negatively impacted by the proposed bridge are the following native fish species; (*Agosia chrysogaster*), (*Catostomus clarki*), (*Catostomus insignis*), (*Gila robusta*), (*Poeciliopsis occidentalis occidentalis*) and (*Rhinichthys osculus*). Tonto Creek was previously but is no longer designated as critical habitat for Spikedace (*Meda fulgida*) and Loach Minnow (*Tiaroga cobitis*). Riparian obligate avian species include; (*Coccyzus americanus occidentalis*), (*Haliaeetus leucocephalus*), (*Rallus longirostris yumanensis*) and (*Empidonax traillii extimus*). Additional information with respect to these concerns can be found in the environmental evaluation (e.e.) included in this document as appendix A.

(2) Hazardous, Toxic and Radiological Waste (HTRW) Assessment. The Corps' Engineering Regulation (ER) providing guidance for the conduct of Civil Works Planning Studies is contained in ER 1105-2-100. The policies and authorities outlined in ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects and ER 405-1-12, Real Estate Handbook, were developed to facilitate the early identification and appropriate consideration of HTRW issues in all of the various phases of a water resources study or project. The American Society for Testing and Materials (ASTM) Standards E1527-00 and E1528-00 provide a comprehensive guide for conducting Phase I Environmental Site Assessments (ESA's). When the Phase I ESA identifies potential environmental concerns, a Phase II ESA is initiated in which sampling of the project area is performed to determine the presence of any HTRW contamination. Phase II sampling is completed in accordance with the U.S. Army Corps of Engineers Engineering Manual (EM) 200-1-3, Environmental Quality- Requirements for the Preparation of Sampling and Analysis Plan (CEMP-RT/CECW-E, February 1, 2001). The policy of the U.S. Army Corps of Engineers is to avoid construction of Civil Works projects when HTRW is located within the project boundaries or may affect or be affected by such projects. The Phase I ESA will be conducted and completed during the Design and Construction phase, this would begin in Fiscal Year 2005 (FY-05) contingent on Congressional Authorization and Appropriation.

E. FUTURE WITHOUT PROJECT CONDITIONS.

(1) General: Currently access to east side communities is provided by three low-water crossings (fords). During low flows Tonto Creek is braided with the main surface flows confined within two meandering low flow channels. During high flows Tonto Creek stretches across the floodplain making passage across Tonto Creek impossible or at the least extremely dangerous for all vehicular traffic. In the recent past two residents have lost their lives attempting to cross Tonto Creek. Winter and spring flooding, between January and April, results in Tonto Creek being impassable for 2 to 3 weeks annually. The most significant local flood event occurred in 1993 resulting in 6 weeks of closures and expenditures of approximately \$210,000.00 dollars in flood response costs. During these periods alternate A-Cross Road is the access for properties on the eastside of Tonto Creek. The access is from State Route 288, and can require sixty to ninety minutes travel time under good weather conditions. This alternate route is moderately maintained, contains unprotected low-water crossings, is not recommended for low clearance vehicles and is not an all weather road.

To maintain a functional unprotected low-water crossing requires recurrent maintenance. Maintenance activities aid in deterioration of the aquatic habitat, increase turbidity, reduce water quality, increase stress on obligate riparian vegetation, reduce infiltration from soil compaction, and provide increased and repeated opportunities for invasive species establishment and expansion with each disturbance. There are also the additional pollutants that are introduced into the water and soil from vehicles that come in physically contact with the water.

Future conditions, without implementation of a project alternative, are anticipated to continue degrading. Continued limited access and the public health and safety concerns. Increased development will increase recreation impacts and increased groundwater pumping and surface water diversion, which will affect the creek and the species living there (**Plate 5**). This area is one of the fastest growing in Gila County outside of Payson and Globe/Miami. There is also the need for improved law enforcement with respect to activities in the floodplain/conveyance corridor.



Plate 5- Some existing development along the eastside of Tonto Creek.

2. THE PROJECT MANAGEMENT PLAN (PMP).

CHAPTER I – PURPOSE AND SCOPE

1. DEFINITION OF A PROJECT MANAGEMENT PLAN:

a. The project management plan, herein after referred to as the PMP, is an attachment to the Cost Sharing Agreement (CSA), which defines the planning approach, activities to be accomplished, schedule, and associated costs that the Federal Government and the local sponsor(s) will be supporting financially. The PMP, therefore defines a contract between the Corps and the local Sponsor(s), and reflects a "buy in" on the part of the financial backers, as well as those who will be performing, and reviewing, the activities involved in the study. The PMP describes the initial tasks of the study, continues through the preparation of the final study report, the project management plan for project implementation and design agreement, and concludes with support during the Washington-level review of the final study report.

b. The PMP is a basis for change. Because planning is an iterative process without a predetermined outcome, more or less costs and time may be required to accomplish reformulation and evaluations of the alternatives. Changes in scope will occur as the technical picture unfolds. With clear descriptions of the scopes and assumptions outlined in the PMP, deviations are easier to identify. The impact in either time or money is easily assessed and decisions can be made on how to proceed.

c. The PMP is a basis for the review and evaluation of the study report. Since the PMP represents a contract among study participants, it will be used as the basis to determine if the draft study report has been developed in accordance with established procedures and previous agreements. The PMP reflects mutual agreements of the district, division, sponsor and HQUSACE into the scope, critical assumptions, methodologies, and level of detail for the studies that are to be conducted during the study. Review of the draft report will be to insure that the study has been developed consistent with these agreements. The objective is to provide early assurance that the project is developed in a way that can be supported by higher headquarters.

d. The PMP is a study management tool. It includes scopes of work that are used for funds allocation by the project manager. It forms the basis for identifying commitments to the non-Federal sponsor and serves as a basis for performance measurement.

2. SUMMARY OF PROJECT MANAGEMENT PLAN CONTENTS:

This PMP is comprised of the following chapters:

- **Chapter 1 - Purpose and Scope.** This chapter includes the definition of the PMP and a summary of the PMP requirements.
- **Chapter 2 – Plan Formulation.** This chapter provides a description of terminology and outlines the plan formulation components considered in the study.
- **Chapter 3 - Scopes of Work.** A detailed scope of the tasks and activities that describe the work to be accomplished, in narrative form.

- **Chapter 4 - Responsibility Assignment.** An Organizational Breakdown Structure (OBS) will define "who" will perform work on the study. This allows the identification of the functional organization that will perform each of the tasks in a Responsibility Assignment Matrix (RAM).
- **Chapter 5 - Study Schedule.** The schedule will define "when" key decision points, CESP milestones conferences and mandatory HQUSACE milestones will be accomplished.
- **Chapter 6 – Cost Estimate.** This is the baseline estimate for the feasibility phase of the study.

3. LOCAL SPONSOR

The potential non-Federal sponsor(s) are the Flood Control District of Gila County, Gila County Public Works and/or Arizona Department of Transportation. Prior to moving forward as the sponsor(s) these agencies will be made aware of the required obligations and of consent to assume the costs of operation and maintenance of the project upon completion of construction. Other potential sponsors would include any of the surrounding local communities. Additional potential sponsors are being determined and will be contacted and presented with the benefits of this project and solicited for additional sponsorship of the project. They will also be informed of the required obligations and the costs of operation and maintenance of the project upon completion of construction.

CHAPTER II – PLAN FORMULATION

Planning Assumption: The Scope, associated tasks, durations and cost estimates of future work required to fill data gaps and complete the Detailed Project Report, were developed with the assumption that this would proceed through the Corps of Engineers process.

A. Planning Objectives and Constraints. Water resources planning studies are bound by all applicable laws of the United States and of the State of Arizona, all Executive Orders of the President, the Water Resources Council's Principles and Guidelines, and all engineering regulations of the U.S. Army Corps of Engineers.

(1) Public and Stakeholder Concerns: Initial concerns were expressed during the two scoping meetings and through coordination with potential sponsors and with other local, State and Federal agencies and from public comments from the informational meeting with the Public. The public concerns that are related to the establishment of planning objectives and constraints are:

- 1) Potential for loss of life and property during flood events.
- 2) The need for a safe and reliable high water crossing.
- 3) Access and egress for residents on the eastside of Tonto Creek.
- 4) Reduce flood damages and improve public safety.
- 5) Improve water quality and reduce negative environmental impacts associated with operation and maintenance of low-water crossings.
- 6) Aggradation, (sediment deposit) of this 14-mile reach of Tonto Creek.
- 7) Increased native vegetation and invasive species in the channel.
- 8) Degradation of existing high value riparian habitat and invasive species establishment and expansion.
- 9) Several special status species in this 14-mile reach of Tonto Creek.

(2) Planning Objectives. The water and related land resource problems and opportunities identified in this reconnaissance study are stated as specific planning objectives to provide focus for the evaluation and development of alternatives. These planning objectives reflect the problems and opportunities and represent desired positive changes in the without project conditions. The planning objectives for the Tonto Creek study area are specified as follows:

- To complete a comprehensive reconnaissance level evaluation and assessment of local preliminary bridge design and setting location alternatives and determine the preliminary optimal, "best" placement location, considering economic efficiency, engineering feasibility and environmental sensitivity.

- To complete an environmental evaluation to establish a characterization of the existing and future without project conditions and provide a scope and cost estimate to complete a DPR and EIS.
- To complete a cursory socioeconomic review to provide an overview of the economic and social concerns and issues associated with this reach of Tonto Creek and provide a scope and cost estimate for future work to complete a Detailed Project Report (DPR).
- Provide a scope and cost estimates for future technical investigations, (hydrology, hydraulics, geotechnical, etc.) data collection and scope of work to complete a DPR to move toward further design and outline elements required prior to final design and construction activities.
- To provide a rough estimate for the overall cost of construction by inflating the overall costs of construction from 1993 dollars to 2005 dollars. To provide a scope with durations and costs estimate for the Corps to complete a Detailed Project Report for Tonto Creek.

(3) Planning Constraints. Unlike planning objectives that represent a course of action for desired positive change. Planning constraints represent restrictions that should not be violated. The planning constraints identified in this study are as follows:

- Ensure the project minimizes and mitigates any negative impact to the environment.
- Existing federal, state, county, tribal and private land ownership, including sand and gravel ownership and leases, will impact real estate appraisals and acquisitions.
- Existing federal, state, county, tribal and private water laws and agreements will be adhered to. The Arizona Water Code guides and the use of water in Arizona.
- Any alternative considered shall not induce any additional flood or erosion impacts or negatively impact water quality or conveyance.
- Any alternative considered shall minimize and mitigate any impacts to special status species, while maintaining the watershed and riparian corridors stability.
- Boxing and Relocation of Barrel Cactus, Ocotillo's and Saguaro Cactus that would be subject to loss within the proposed construction corridor; refer to as BOS Mitigation, U.S. Forest Service requirement.
- Any alternative considered must consider the road alignments for the bridge. The United States Forest Service, Tonto Basin Ranger District is opposed to creating new road alignments through undisturbed habitat, minimal disturbance and short distances.

B. Development of Alternative Plans and Assessment of Local Alternatives.

(1) **Available Measures to Address Problems and Opportunities.** Both structural and nonstructural measures are available to alleviate flooding issues and will be outline for consideration as potential solutions to the issues and concerns associated with this 14-mile reach of Tonto Creek.

- a) **Nonstructural Measures.** These measures are defined as those, which reduce or eliminate the problems, concerns or flood damages, without significantly altering the nature or extent of the flooding; by changing the use of the floodplains or accommodating existing uses into the flood hazard. Examples of nonstructural measures are flood proofing, permanent evacuation or relocation, flood warning systems, Emergency Action Plans (EAP's) that outline actions in response to anticipated levels of risk or threat and regulation of the use of the floodplains.
- b) **Structural Measures.** These measures are designed to reduce or prevent the problems, concerns or flood damages by altering the physical characteristics or conditions in the location where they occur. The Structural measure suggested here is a bridge setting.

NOTE : During the initial scoping meetings the steering group felt that even though some nonstructural measures could be implemented to alleviate some of the problems and concern along Tonto Creek; they did not meet the Congressional intent to assess and evaluate local alternatives for a "high-water crossing" on this 14-miles reach of Tonto Creek. Therefore, it was recommended that any of the nonstructural measures could be combined with the purposed structural alternative at any of the five locally proposed locations.

(2) **Screening of Alternative Plans.** The Criteria for screening the alternatives was provide by Arizona Congressional District 1, Congressman Renzi's Office. The criteria for screening the alternatives are 1.) Engineering Feasibility, 2.) Economic Efficiency and 3.) Environmental Sensitivity (the action that would result in the least number of negative impacts to the environment). The alternatives to be assessed, evaluated and considered in the screening process include the following:

- a) **No Action.** The Corps is required to consider the option of "No Action" as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). No Action assumes that no project would be implemented by the Federal Government or by local interests to achieve the planning objectives. No Action, which is synonymous with the Without Project Condition, forms the basis from which all other alternative plans are measured.
- b) **Nonstructural.** Some nonstructural measures could be implemented for the Tonto Creek Study area in combination with the structural measure suggested, a bridge setting. Regulation of the floodplain use with or without a bridge is recommended and complies with non-Federal

responsibilities. An Emergency Action Plan (EAP) may be combined with any of the alternatives.

- c) **Structural.** The structural alternative is a bridge setting on Tonto Creek to provide a safe high water crossing for the community. This alternative will be assessed and evaluated with respect to the optimal location for the bridge setting from the five proposed during the initial scoping meetings. The Congressional Screening Criteria provided were used to screen these five location alternatives. An Emergency Action Plan (EAP) may be combined with any of the alternatives.

(3) Plan Evaluation. The study alternatives were evaluated for the ability to meet the study objective of determining the preliminary optimal location to set a bridge on this reach of Tonto Creek. The determination will result from the evaluation and assessment of the local design and location alternatives.

(4) Associated Evaluation Criteria. Alternatives were also evaluated by the following criteria:

Completeness – Completeness is the extent to which a given alternative provides and accounts for all the necessary investments and other actions, to ensure the realization of the planned effects.

Effectiveness - Effectiveness is the extent to which an alternative plan alleviates the specified problem and achieves the recognized opportunities. The planning objective of this study was to assess and evaluate local designs and purposed locations to set a bridge on Tonto Creek and provide a scope and cost estimates to complete a Detailed Project Report. To determine the most feasible and cost effective location that results in the least negative environmental impacts and provides a safe and reliable high-water crossing for the community.

Efficiency - Efficiency is the extent to which an alternative is considered a cost effective means of solving the specified problems and of realizing the recognized opportunities.

Acceptability - Acceptability is the viability of an alternative with respect to the desires of the state, local government and the public. In order to be acceptable, the alternative must be in accordance with existing laws, regulations and public policies. All alternatives evaluated were considered acceptable.

CHAPTER III – SCOPES OF WORK

1. DETAILED SCOPES OF WORK

For each task that is included in the work breakdown structure, a scope of work is developed that describes the work that is to be performed. For each task, the scope describes the work, including specific activities, to be accomplished in narrative form. The study team has developed these scopes of work and associated cost estimates.

2. DURATIONS OF TASKS

The durations for the tasks are entered into the project's network analysis system (NAS) to develop the potential schedule. The durations are estimates based on past experience and professional judgment; negotiations between the Project Manager and the Chiefs of the responsible organizations and Non-Federal Sponsor(s) will determine and establish the final schedule.

3. COSTS OF TASKS

Lastly, the scopes of work for the tasks are grouped by the parent tasks that they support. The total estimates for the parent tasks are then combined in the Cost Estimate for the Detailed Project Report. The cost estimates for the tasks are based on past experience and professional judgment; negotiations between the Project Manager, Chiefs of the responsible organizations, and the Non-Federal Sponsor(s) will determine and establish the anticipated costs associated with completing the overall study tasks and effort.

4. WORK TASKS

The work to be performed consists of a feasibility level of effort according to the task descriptions presented below. Only the major tasks required to complete the Detailed Project Report are given. The following descriptions are intended to reflect the entire study scope, including work to be performed by the Corps, A-E services, and Local Sponsors in-kind services. The costs are summarized in Chapter 4 - Detailed Project Report Cost Estimate.

The following table contains cost estimate for completion of the technical studies and analysis for the two preliminary optimal locations for the proposed bridge on Tonto Creek. The proposed locations are the result of a review and evaluation of the existing information and technical reports, coordination and input from the steering group, input from the technical study team and the public. The contingency is figured at nearly ten percent, (10%) to reflect an eighty-five percent, (85%) level of confidence in the estimates provided to evaluated the two preliminary locations recommended.

The non-Federal sponsor must contribute 50 percent of the cost of the study during the period of the study. The non-Federal share may be made by the provision of services, materials, supplies or other in-kind services necessary to prepare the feasibility report. The feasibility cost estimate below includes credit for work that is to be accomplished by the non-Federal sponsor.

A Summary of the Overall Cost Estimate for Future Work to complete the Tonto Creek Special Study Detailed Project Report.

Description	Federal \$	In Kind \$	In Kind Service	Total
Surveys and Mapping except Real Estate				35,000
Hydrology and Hydraulics Studies/Report				100,000
Geotechnical Studies/Report				80,000
Engineering and Design Analysis Report				60,000
Structural Analysis				50,000
Socioeconomic Studies				74,000
Real Estate Analysis/Report				20,000
Environmental Studies/Report (Except USF&WL)				270,000
Fish and Wildlife Coordination Act Report				55,000
Cultural Resources Studies/Report				50,000
Cost Estimates				40,000
Public Involvement				22,000
Plan Formulation and Evaluation				70,000
Final Report Documentation				10,000
Technical Review				35,000
Project Management and Budget Documents				10,000
Contingency, approximately 10% of the total study cost.				100,000
Project Management Plan (PMP)				10,000
PED Cost Sharing Agreement				15,000
Total				1,106,000

SURVEYS AND MAPPING ANALYSIS except for REAL ESTATE
SCHEDULE DURATION: XX/05 thru XX/07
ESTIMATED TOTAL TASK COST: \$ 35,000.00
(Federal = / Non Federal \$ = / Non Federal In-Kind Service =)

Comment [LAD1]: Increased the amount to reflect additional effort and product requirements.

This task begins the data collection period. The Flood Control District of Gila County has provided two CD's of some existing aerial photos and GIS data for the study area. A review will be conducted to determine the gaps that need to be filled. Other existing Geographical Information System (GIS) data will be gathered from Federal, State, County and Local Government agencies and made available for review. The GIS data will be reviewed to ensure it includes all the necessary themes to describe the information that will be developed by the study team during the course of this feasibility study. When the GIS is populated with all available and generated information, it will be used to evaluate alternative measures and plans. All data obtained and generated will be reviewed for applicability. Field sampling will be conducted if found to be necessary to generate or verify data. The mapping will be utilized to prepare plates suitable for inclusion in the Detailed Project Report. The plates will depict existing and planned facilities. A preliminary list of mapping items includes, but is not limited to:

01: General Mapping of Study Area Attributes. The Flood Control District of Gila County has provided CD's of their existing aerial photos and GIS data for review to determine what mapping and attributes are available and/or needed. This map set and maps utilized during the course of the reconnaissance evaluation will be reviewed and updated as new technical information is generated during the Detailed Project Report phase of study. Mapping will be in sufficient detail to provide necessary information for completion of the study. This may include:

- 1) Coverage and sufficient detail to complete the hydrologic, hydraulic, and sedimentation studies.
- 2) Coverage and sufficient detail to prepare conceptual design of proposed alternatives.
- 3) Location of existing/proposed infrastructure. Describe constraints on location of proposed features.
- 4) Land ownership and land use.
- 5) The 100-year floodplain, identified areas of aggradation, degradation and bank erosion.
- 6) Cultural resources (NOTE: Location of cultural resources is confidential, cultural resources GIS layer will not be public)
- 7) Regulatory (Section 404) related information.
- 8) Vegetative habitat and wetlands.

The mapping will be utilized for developing hydraulic, geomorphic, and sediment analyses as well as conceptual design of alternatives. It will also be the basis of plates suitable for inclusion in the Detailed Project Report and engineering appendices. The plates will depict both existing and planned facilities. The Digital Base Map Data Base

should be State Plane and a format compatible with the sponsor's GIS database.

02: GIS Tasks: The information included in the GIS shall follow the Spatial Data Standard, (SDS), as described by CADD/GIS Technology Center, Federal Government. The GIS will serve as a central repository for project spatial data, and can be made available to public and private agencies during and after the study. All data shall be reviewed by the local sponsor(s) and the Corps of Engineers to ensure copyright restrictions are protected prior to posting. Each separate discipline shall liaise with the Study Manager prior to collecting or producing new geospatial data to ensure compatibility with the GIS. Each separable element will be stored in the GIS as a separate theme. The themes shall be compatible with the Arc Info/Arc View format. Metadata for all data is required. The geodetic reference for horizontal positioning shall be based on the Arizona State Plane Coordinate system Zone V, and North America Datum of 1983 (NAD 83). The geodetic reference for elevation and vertical data shall be based on the North America Vertical Datum of 1988 (NAVD 88).

02.A: Build Digital Base Map Database and Develop Base Maps for Alternatives.

02.B: Negotiate Data Exchange Agreements, Synchronize Internal/External Data Sources and Develop Large Data Set Exchange Processes.

02.C: Create Map Templates for Public Display.

02.D: Perform appropriate GIS Analysis.

Surveys and Mapping Analysis except Real Estate Total Cost \$ 35,000.00
(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

HYDROLOGY AND HYDRAULICS STUDIES / REPORTS

SCHEDULE DURATION: XX/05 thru XX/07

ESTIMATED TOTAL TASK COST: \$ 100,000.00

(Federal = \$ / Non Federal \$= / Non Federal In Kind Service =)

Comment [LAD2]: Increased the amount to reflect additional effort and product requirements.

Hydrology and Hydraulics Review (1993 Federal Highway Administration Report).

Background: The gauging station on the north boundary of the study area has been in place for about 60-years. It sits just north of the confluence of Tonto Creek and Gun Creek. The Lone Fire in 1996 burned a large extent of the upper watershed of most of the tributaries along the west side of Tonto Creek. The elimination of the vegetative cover in these tributaries has increased the amount of sediment delivered to Tonto Creek from these tributaries. There is also some diversion and detention of flows in reach 3, the upper reach.

There has been a Federal Emergency Management Agency, (FEMA) floodplain study in the area between Roosevelt Lake Gardens East and Roosevelt Lake Gardens West. The Channel was subdivided and the Manning's n values were determined. This analysis shows that Tonto Creek, for a majority of its length, flows in a sub-critical flow regime. The average flow depths vary from 5.9 feet to 13.1 feet, and the average velocities vary from 4.4 for the 50-year, to 9.2 feet per second for the 100-year storm events.

Any additional Hydrology and Hydraulics analysis and evaluation required is outlined in Chapter 3, Scopes Of Work, of the Project Management Plan. The task items describe the activities to complete the Detailed Project Report. This work would begin in Fiscal Year 2005 (FY-05) contingent to Congressional Authorization and Appropriation.

Following is a summary of the computed discharges in the vicinity of these fords from the 1993 FHWA report.

Crossing Alternative	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q50 (cfs)	Q100 (cfs)
Lower (A-Cross Road)	15,700	62,299	103,211	143,114	192,002
Middle (Bar-X Road)	14,606	57,957	96,019	133,141	178,623
Upper (Punkin Center)	13,753	54,572	90,410	125,365	168,190

Tonto Basin, Tonto Creek High Water Elevation Estimations from Gila County Public Works for the 1993 Flood.

Description	Legal Location	Latitude	Longitude	Elev.
Punkin Center Crossing	T6N, R11E, S11 SE	N,33° 52' 15"	W,111°81'42.1"	2317
Bar-X Road Crossing (E. Bank)	T6N, R10E, S36 NE	N,33° 49' 24.7"	W111°16' 50.1"	2224
A-Cross Road Crossing (E. Bank)	T5N, R11E, S8 NW	N33° 47' 36.5"	W111°15' 19.9"	2168

HYDROLOGY AND HYDRAULICS TASK:

This section describes the effort required for hydrologic and hydraulic evaluations of the existing features and facilities in the Tonto Creek watersheds. The goal is to determine the feasibility of local bridge setting alternatives with respect to hydrology and hydraulic conditions and concerns.

A. Hydrology -

A.1 Research, collect, and review hydrologic information from Corps of Engineers, other public agencies, and private consultants.

A.2 Evaluate the 100-year frequency event discharges at selected locations along Tonto creeks base on frequency analysis.

A.3 Attend meetings, milestone conferences, and coordinate as required.

A.4 Prepare hydrologic documentation with plates and figures showing frequency discharges at selected locations along Tonto Creek.

A.5 Respond to independent technical review comments, attend review conferences, and modify the hydraulic documentation report as necessary.

A.6 File study material.

B. Hydraulics -

One hundred year frequency event floodplain and floodway models will be developed for Tonto Creek at the locations of interest necessary to complete the desired analysis. The models will be used to evaluate the flood conveyance capacity of the major channels within the watershed; determining the extent of overflows for water escaping the channel; and developing the corresponding floodway for the final recommended preliminary design solution (if appropriate) at the bridge locations. Overflow maps for the 100-year frequency event floodplain and associated floodway delineations will be produced. Flood profiles for the 100-year flood event will also be developed.

- B.1 Research, collect, and review hydraulic information from the Corps of Engineers, Gila County, other public agencies, and private consultants. Identify all water control structures and channel improvements in the watershed. Gather all pertinent information related to structures.
- B.2 Collect and review as-built plans for structures, bridges, utilities; topographic mapping; and field survey to determine channel configuration. Prepare a list of all plans and surveys available, with the dates and a map locating all plans and surveys along Tonto Creek. Take measurements of pertinent features needed for hydraulic analysis.
- B.3 Perform a field reconnaissance of the Tonto Creek and prepare field notes, sketches, and photographs of bridges, utility crossings, confluences, transitions, and other areas as needed to verify channel geometry, stability, roughness values, debris trapping problems, and river morphology. Provide hydraulic parameters (reach length, slope, geometry, and roughness) for use in the hydraulic models.
- B.4 Prepare a detailed hydraulic analysis of Tonto Creek using the HEC-RAS and HEC-GeoRAS computer programs. Prepare specific hydraulic analyses to assess the possible location of bridges. If feasible, develop preliminary hydraulic analyses with associated design recommendations to mitigate excessive floodplain and floodway inundation areas. Generate corresponding overflow maps and flood profiles for the 100-year frequency flood event. Tabulate hydraulic parameters including water surface elevation, depth, velocities, slope, and top width.
- B.5 Attend meetings, conferences, and coordinate as required.
- B.6 Prepare hydraulic documentation presenting tables of hydraulic parameters, 100-year overflow and floodway maps, and flood profiles.
- B.7 Respond to independent technical review comments, attend review conferences, and modify the final Hydraulics Appendix as required.
- B.8 File study material.

The following is a break down of the associated costs for the Tasks and Products produced and provided by the Hydrology and Hydraulics Section.

Hydrology and Hydraulics Evaluation and Assessment.

Hydrology		Hydraulics	
A.1	\$5,000	B.1	\$5,000
A.2	\$10,000	B.2	\$15,000
A.3	\$3,000	B.3	\$25,000
A.4	\$3,000	B.4	\$10,000
A.5	\$2,000	B.5	\$10,000
A.6	\$2,000	B.6	\$3,000
Subtotal	\$25,000	B.7	\$2,000
		Subtotal	\$75,000

Hydrology and Hydraulics Total Cost \$ 100,000.00
 (Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

GEOTECHNICAL STUDIES / REPORT
SCHEDULE DURATION: XX/05 thru XX/07
ESTIMATED TOTAL TASK COST: \$ 80,000.00
 (Federal = \$ / Non Federal \$= / Non Federal In Kind Service =)

Comment [LAD3]: Increased the amount to reflect additional effort and product requirements.

Scope summary. In order to obtain samples for the site characterization and detailed project report-level engineering analyses of both the bridge structure foundation and approach roadway within the study area of Tonto Creek Basin, AZ., the Geotechnical Branch shall contract for all the drilling, coring, and sample collection to obtain subsurface data and sample material for the project. This responsibility includes all pre-drilling activities, such as regulatory coordination, permitting work for utility checks, site access evaluation, contracting, hole logging and sampling, and all associated travel costs for Government personnel. The bridge structure foundation and approach roadway alignment will be sampled by truck-mounted drilling equipment and backhoe. The Real Estate group will obtain right-of-entry for all field investigation.

The Geotechnical Branch will test the samples at the Geotechnical Branch laboratory and at contracted labs. Tests will determine engineering characteristics of both the bridge structure foundation and approach roadway foundation.

Site characterization studies will be documented in a Geotechnical Appendix to the detailed project report. Any existing geologic and geotechnical information will be researched and summarized. Supplemental site investigations, sampling, and testing will be performed, as based on the results of the database search. The field investigations performed will be described and drilling logs will be prepared for publication. The samples, logs and other field and map data will be used to characterize the foundation materials. As a part of the report, the Geotechnical Branch will prepare assessments of the suggested bridge support structure and approach roadway foundation designs, and construction considerations. The results of these studies will also be included in the Geotechnical Appendix. A detailed description of Geotechnical tasks follows.

Scope duration.

Approximately 12 months, the first 4 months of which are preparing for the fieldwork (including contracts). Field investigation will occur within months 3 through 6. Sample testing will be done within months 3 through 8. Analysis of data and report preparation will be done in months 5 through 12.

The precise field investigation and analyses will be determined based upon a final project scope. It is recognized here that as of this writing, the project scope is still developing and the site(s) of the Geotechnical investigation will change accordingly.

Detailed Description of Geotechnical Tasks.

A.1 Prepare the PMP and Coordination of the Project

A.2 Catalog existing Geotechnical Data. Prepare preliminary catalog, for review by all potential contributors (ex, ADOT, FHWA, USFS). Schedule post-review coordination with reviewer, in order to discuss and obtain any additional existing Geotechnical data.

A.3 Regional and Site Geology. Review catalog of existing Geotechnical data/reports of project area. Supplement Geotechnical catalog. Review existing geology reports/data. Coordinate in preparation of plans of investigation. Prepare narrative of the regional and site(s) geology.

A.4 Pre-Exploration preparations. Tasks include obtaining drilling contracts and clearing underground utilities. Coordinate with the Environmental group to obtain any regulatory permits or local permits, as may be required and provide exploration maps to the USACE Real Estate group.

A.5 Access Permitting, Improvement, And Post-Drill Restoration. Obtain drill access, as coordinated with the Real Estate and Environmental groups, and Sponsor. Restore areas, if needed, to the coordinated requirements of applicable agencies.

A.6 Constructibility Issues and Geotechnical Design Support

A.7 Structure Foundation Investigation. Site specific rotary sampling to an estimated depth of 30-feet, in order to establish foundation conditions for abutment and pile structure(s), in order to support a proposed bridge.

A.8 Structure Foundation Testing. Mechanical analysis and strength testing and analyses.

A.9 Structure Foundation Design. Characterize structure foundation materials. Design appropriate structure support.

A.10 Roadway Alignment Investigation. Alignment investigation for the approach roadway (classification and field density testing) in order to address the section design.

A.11 Roadway Alignment Testing. Mechanical analysis, compaction and strength laboratory testing.

A.12 Roadway Alignment Foundation Design. Characterize roadway alignment materials. Analyze alternative stabilization methods.

A.13 Roadway Pavement Design. Design roadway pavement section for applicable traffic loading.

A.14 Plate Preparation. Prepare plates in coordination with the Civil Design group. Prepare plates showing logs for all Corps of Engineers investigations. Prepare plates showing all existing logs that apply to design or construction of the proposed project. Prepare plans showing the location of all investigation sites. Prepare plates showing seismic and regional geology conditions. Prepare plates showing sections of critical site geology, as required.

A.15 Provide Geotechnical Design Support. Coordinate with Civil, Structural and Cost Engineering groups on detailed project report level design issues. Characterization of structure foundation materials. Development of site-specific parameters for foundation design and for seismic analysis of proposed structure(s), as required.

A.16 Identify Constructibility Issues. Coordinate with Design, Construction and Environmental team members to identify and resolve constructibility issues.

A.17 Report Preparation.

A.18 Independent Technical Review.

Basis for Cost Estimate.

This estimate assumes that there will be no alternatives analyzed which significantly differ from those discussed. It is also recognized that alternatives that have been discussed will not be carried through the detailed project report study, and will not be part of the Geotechnical exploration.

Results, including site assessment, design and construction considerations, and impacts on design and construction costs, will be summarized and presented as a Geotechnical Appendix to the detailed project report. The studies will be performed and appendix prepared in accordance with all applicable Corps of Engineers Engineering Regulations (ER), Engineering Manuals (EM) and Engineering Technical Letters (ETL).

Limitations.

The cost estimate assumes no significant deviation from the project description. Changes may result in a significant increase or decrease of scope of work and costs. The Geotechnical Branch must be consulted concerning the impact of those changes.

The following is a break down of the associated costs for the Tasks and Products produced and provided by the Geotechnical Section.

Geotechnical Investigations, Studies and Report.

A.1	\$ 8,000	A.10	\$ 8,000
A.2	\$ 1,000	A.11	\$ 4,000
A.3	\$ 2,000	A.12	\$ 2,000
A.4	\$ 2,000	A.13	\$ 3,000
A.5	\$ 3,000	A.14	\$ 3,000
A.6	\$ 3,000	A.15	\$ 7,000
A.7	\$14,000	A.16	\$ 6,000
A.8	\$ 5,000	A.17	\$ 3,500
<u>A.9</u>	<u>\$ 2,000</u>	<u>A.18</u>	<u>\$ 3,500</u>
Sub-Total	\$40,000	Sub-Total	\$40,000

Geotechnical Studies / Report Total Cost \$80,000.00
 (Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

ENGINEERING/DESIGN ANALYSIS (\$60,000.00)
STRUCTURAL ANALYSIS (\$50,000) COST ESTIMATING (\$40,000)
SCHEDULE DURATION: XX/05 thru XX/07
ESTIMATED TOTAL TASK COST: \$150,000.00
 (Federal = \$ / Non Federal \$= / Non Federal In Kind Service =)

Comment [LAD4]: Increased the amount to reflect additional effort and product requirements.

A. Construction Cost Estimate and Schedule.

This Section of the Reconnaissance Project Management Plan (PMP) outlines in detail the required tasks and costs needed for the Cost Engineering Section to complete their portion of the Detailed Project Report (DPR).

- 1) Cost Engineering shall prepare and furnish comparative cost estimates of the viable alternatives using the MCACES software and clearly identify the National Economic Development (NED) Plan. Initially, a screening process shall be used to review all the alternatives. Different levels of cost estimating detail may be appropriate at each level of screening. This screening process will narrow the number of alternatives to a final list, i.e., two to five viable alternatives for a more detailed assessment. The cost estimate for each viable alternative shall include appropriate comments describing the method of construction, assumptions used in developing the estimate, and the technical/design data available.
- 2) Upon completion of the comparative analysis, Cost Engineering shall develop the Total Current Working Estimate (CWE) to support the NED Plan. The Total CWE is developed to support the recommend scope and schedule this will be prepared and furnished using the Microcomputer Aided Cost Estimating System (MCACES) software. The Total CWE is defined as the project Baseline Cost Estimate (BCE) and it includes construction features; lands and damages; Planning, Engineering and Design (PED); Construction Management; and contingencies.
- 3) On occasions, the sponsor may request a plan different from the NED Plan. When this occurs, Cost Engineering shall prepare a cost estimate for both the NED Plan and the Locally Preferred Plan. The NED Plan and the Locally Preferred Plan shall be prepared and furnished using the MCACES software.

- 4) The viable alternatives, the Total CWE and the Locally Preferred Plan shall be formatted in accordance with the Current Work Breakdown Structure (CWBS) and an identified price level.
- 5) On the Total CWE and the Locally Preferred Plan, descriptive statements regarding methods of construction, material sources and prices, type of equipment required, access, haul distances, estimated production rates, placement procedures, environmental restrictions, crew sizes and labor rates, dewatering, job conditions, and other assumptions shall be included as appropriate in MCACES as notes.
- 6) Quantity “take-off” must be as accurate as possible and based on all available engineering and design data. Quantity calculations shall be indexed, divided with numerical tabs, and bounded in a 3-ring binder. Calculation worksheets shall make reference to drawings sheet numbers and details.
- 7) The cost engineer is encouraged to use the Unit Price Book (UPB) database as a pricing source. However, all data must be refined to reflect site-specific situations and costs. Material unit costs shall be justified with various pricing sources and quotes. Quotes shall be submitted. Labor unit costs shall come from the labor database in MCACES. The labor database must be updated with the latest Davis-Bacon Rates for the area. Equipment unit costs are obtained from the regional equipment database in MCACES.
- 8) Estimate submittals for review shall occur at each stage of the design process (i.e., pre-final, final and back-check final submittals). The cost estimate submittals shall include as a minimum: quantity calculations; quotes from material suppliers and subcontractors; a narrative defining the parameters upon which the cost estimate has been prepared to support the project scope and schedule; miscellaneous supporting documentation such as backup data, brochures on special equipment, working drawings, production calculations; telephone conversations; a print out of the MCACES estimate including direct, indirect and owner summary sheets, detail sheets and backup; and a floppy disk containing the complete MCACES estimate and all associated databases.
- 9) A construction schedule must be developed using the Scheduling Software. The schedule must identify the sequence and duration of the tasks.
- 10) Contract services for the preparation of quantities and/or cost estimates shall be provided by competent firms specializing in Cost Engineering. Cost engineers assigned shall have MCACES training, cost engineering experience and field experience in civil construction projects. In all cases the procedures and requirements of the following regulations shall apply:
 - i. ER 1110-2-1302 “Civil Works Cost Engineering”,
 - ii. ER 1110-3-1301, “HTRW Cost Engineering”,
 - iii. ER 1110-3-1300, “Military Programs Cost Engineering”, and
 - iv. EI 01D010, “Construction Cost Estimates”.
- 11)The COE and the sponsor must be kept aware of the current and forecasted total cost of the project.

The table breaks down tasks, duration of effort and associated costs from the Cost Engineering Section for CAD Support.

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
DPR	Tasks for DPR				
a	Research, Collect and Review Data	2	\$ 2,000		\$ 2,000
b	Organize Data	2	\$ 2,000		\$ 2,000
c	Revise existing and future without project conditions	1	\$ 1,000		\$ 1,000
d	Participate in alternative development	4	\$ 4,000		\$ 4,000
e	Prepare alternative conceptual plans	10	\$ 9,500		\$ 9,500
f	Revise alternative plans	4	\$ 4,000		\$ 4,000
g	Prepare Recommended Plan	2	\$ 2,000		\$ 2,000
h	Prepare input to DPR document and design appendix	9	\$ 9,500		\$ 9,500
l	Respond to ITR comments	2	\$ 2,000		\$ 2,000
j	Revise DPR document and design appendix	4	\$ 4,000		\$ 4,000
k	All task between these milestone above this line				
	Subtotal	40	\$40,000.00		\$40,000.00

The table breaks down tasks, duration of effort and associated costs for Civil Design Support.

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
DPR	Tasks for DPR				
a	Research, Collect and Review Data	3	\$ 3,000		\$ 3,000
b	Organize Data	3	\$ 3,000		\$ 3,000
c	Visit study area	1	\$ 1,000	\$ 500	\$ 1,600
d	Attend and Participate in Meetings	5	\$ 6,000		\$ 6,000
e	Revise existing/ future without project conditions	1	\$ 1,000		\$ 1,200
f	Participate in alternative development	5	\$ 5,000		\$ 5,000
g	Prepare alternative conceptual plans	10	\$12,000		\$12,000
h	Revise alternative plans	5	\$ 5,000		\$ 5,000
i	Prepare Recommended Plan	3	\$ 3,000		\$ 3,000
j	Prepare DPR document and design appendix	10	\$11,000		\$11,000
k	Respond to ITR comments	3	\$ 3,000		\$ 3,000
l	Revise DPR document and design appendix	5	\$ 5,000		\$ 5,000
m	Participate in DPR conference	1	\$ 1,000	\$ 500	\$ 1,500
n	Structural Analysis and Report				\$50,000
	All task between these milestone above this line				
	Subtotal	55	\$59,000.00	\$ 1,000	\$110,000.00

Engineering/ Cost Estimation and Design Analysis Total Cost \$150,000.00
(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

The following are the suggested Budgetary Prices for the Bridge Setting Location purposed in the Tonto Creek Study Area, Provided by Cost Engineering.

Roadway construction costs:

1.75 miles of roadway cost \$800,000
 0.50 miles of roadway cost \$200,000

Assumptions

- 2-lane, crown section, asphalt
- width of road= 24 ft
- side ditch: 2-ft deep by 6.75-ft wide
- width of right-of-way: 42.5 ft
- subgrade thickness: 12"
- base thickness: 10"
- asphalt thickness: 2.5"
- clearing and grubbing: medium brush/medium trees
- assume 2 culverts per mile

Demolition of existing roadways:

Assume: 24-foot wide road.
 Bituminous pavement removal will cost around \$150,000 for the 1.75 mile stretch.
 And it will cost around \$40,000 for the 0.5 mile stretch.
 Hauling and disposal costs are the critical unknowns in the demolition.

Above cost are construction costs, they do not include PED, Construction management, or contingency.

BRIDGE DESCRIPTION	LENGTH	WIDTH	AREA	BRIDGE UNIT PRICE	BRIDGE PRICE	MOB/DEMOB (10%)	TOTAL BRIDGE COST
Gun Crossing	1,400 ft	40 ft	56,000 sf	\$110.00 /sf	\$ 6,160,000	\$ 616,000	\$ 6,776,000
Kayler Crossing	2,400 ft	40 ft	96,000 sf	\$110.00 /sf	\$10,560,000	\$1,056,000	\$11,616,000
Punkin/Sheep's (Alt 3B)	2,600 ft	40 ft	104,000 sf	\$110.00 /sf	\$11,440,000	\$1,144,000	\$12,584,000
Bar X Crossing (Alt 2B)	2,900 ft	40 ft	116,000 sf	\$110.00 /sf	\$12,760,000	\$1,276,000	\$14,036,000
A-Cross Crossing (Alt 1B)	2,900 ft	40 ft	116,000 sf	\$110.00 /sf	\$12,760,000	\$1,276,000	\$14,036,000

BRIDGE DESCRIPTION	LENGTH	WIDTH	CONTING (25%) \$	TOTAL CONSTRUCT COST \$	PED (10%) \$	S&A (6.5%) \$	TOTAL PROJECT COST \$
Gun Crossing	1,400 ft	40 ft	1,694,000	8,470,000	847,000	550,550	9,867,550.00
Kayler Crossing	2,400 ft	40 ft	2,904,000	14,520,000	1,452,000	943,800	16,915,800.00
Punkin/Sheep's (Alt 3B)	2,600 ft	40 ft	3,146,000	15,730,000	1,573,000	1,022,450	18,325,450.00
Bar X Crossing (Alt 2B)	2,900 ft	40 ft	3,509,000	17,545,000	1,754,500	1,140,425	20,439,925.00
A-Cross Crossing (Alt 1B)	2,900 ft	40 ft	3,509,000	17,545,000	1,754,500	1,140,425	20,439,925.00

NOTES:

- Bridge unit prices assume no environmental constraints, seat abutment, no stage construction, medium spans, no aesthetic issues, dry conditions, and no bridge skew.
- No design or sketches available.
- Assumed bridge width is 40 feet. A 40-foot width accommodates a single lane of traffic (both ways), a 5-foot median and an extra 5-foot on each side for guardrails etc.
- Contingency covers the cost of the approaches.
- PED stands for Planning, Engineering and Design. The Project Management provides this portion of the estimate to the Cost Engineer as per ER 1110-2-1302.
- S&A stands of Supervision and Administration (a.k.a. Construction Management). The Project Management provides this portion of the estimate to the Cost Engineer as per ER 1110-2-1302.

SOCIOECONOMICS STUDIES

SCHEDULE DURATION: XX/05 thru XX/07

ESTIMATED TOTAL TASK COST: \$74,000.00

(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

Comment [LAD5]: Increased the amount to reflect additional effort and product requirements.

This section of the Scope of Work (SOW) outlines the required tasks and associated costs needed to complete a Detailed Project Report (DPR) for Tonto Creek. The intent of the DPR is to evaluate the need for a bridge to cross Tonto Creek in Gila County, Arizona. A potential bridge crossing will provide residents of several communities along the east bank access to Interstate 188 on the west bank of Tonto Creek when it floods. Interstate 188 is a major thoroughfare linking residents to needed goods and services. Upon evaluation of costs and benefits associated with each crossing, a plan will or will not be recommended as a possible option using both Federal and Local Government dollars.

The bases for recommendation will be the potential reduction in vehicle operating and travel delay costs associated with the extra travel needed to find a crossing point along Tonto Creek when it floods. Public health and safety issues such as the need for safe and reliable access by the Tonto Basin Fire District's emergency and response apparatus and the Tonto Basin school bus to the east bank will be discussed as well as the associated costs involved.

The following is a brief description of the tasks required for the preparation of the Detailed Project Report (DPR).

Demographic Projections:

1. Population: Population estimates and projections will be developed to support current and future traffic delay and automobile costs associated with the extra travel time and operating costs of vehicles needing to cross from residential areas on the east side of Tonto Creek to businesses and Interstate 188 on the west side of Tonto Creek. Population estimates and projections for the study area will be assessed based upon a number of sources, including the US Census, State Universities, and State, County, and City Government agencies. Population estimates for the County, City and study area will be made at aggregate levels. However, population projections will be made primarily to the study area and will be based on historical population growth and potential development in the area. If historical population growth and potential development estimates are unavailable a compound population growth rate will be applied to current population estimates and projected out over the project life.
2. Land Use: Aerial photography, land use plans and general plans will be analyzed to determine the current land use, amount of land available for development and land use designations such as residential, commercial, industrial, public, parks, etc. Future land use over the period of analysis will be projected in the study area based upon population projections for the study area, land available for development and land use designations.

3. Traffic Volumes: Traffic volume estimates will be obtained through the Gila County Department of Transportation. If estimates are not available approximations will have to be made using the two previously discussed demographic projections and adjustments will have to be made accounting for the variability of the recreational season and the traffic volume increases in recreational areas such as parks and trail facilities. Traffic count projections will be estimated in a similar manner as described under population demographic.

Traffic Costs:

1. Operating Costs: Frequency, depth, and duration of flooding along frequently driven roadways within the study area will be needed to calculate the operating costs of vehicles. The frequency of an event will have an associated depth. This depth will have a duration or time frame where the floodwaters will remain above the depth at a given frequency. Traffic volumes will be estimated to reflect the duration at a given frequency. Then traffic volumes will be multiplied by additional miles. Additional miles can be defined as the difference in miles between the original route and detour route of a vehicle needing to cross Tonto Creek. Additional mileage (defined as additional miles (defined above) multiplied by traffic volumes) will then be multiplied by operating costs per mile.
2. Traffic Delay Costs: Traffic delay costs will account for the additional time spent by individuals who are forced to take detours due to road closures as they try to cross Tonto Creek when it floods. Additional mileage defined as traffic volumes multiplied by additional miles (defined in the section entitled: Operating Costs) reflects total miles traveled. Additional mileage will be divided by miles per hour to estimate the amount of time traveled. A dollar value per hour of time will be estimated using standard US Army Corps of Engineers methodology.
3. Operating and Traffic Delay Costs. Operating and traffic delay costs will be derived based upon estimates of costs at several frequencies. These costs are plotted against frequency to derive a damage frequency curve. The area under the curve is then calculated to arrive at Average Annual Damages (AAD). Residual damages will be evaluated for each proposed alternative.

Emergency Response:

1. Emergency Costs: Emergency costs associated with the inability of vehicles able to cross Tonto Creek when it floods will be evaluated by accounting for the lack of access to food, fresh drinking water, emergency response, fire rescue, schools, etc. An attempt will be made to quantify such cost in monetary terms and calculate annual damages. If available data is insufficient, a qualitative discussion will be provided.

Flood & Other Damages:

1. Flood and Other Damages: To the extent that any alternative would reduce any flood or any other damages in the study area to either public or private property, such damages will be evaluated.

Cost Analysis:

1. Cost Analysis: US Army Corps of Engineers Cost Engineering Section will provide a detailed MCACES cost estimates for each alternative. Interest During Construction (IDC) or in other words the accounting for the cost of capital incurred during the construction period will be calculated. Total costs will be annualized for each proposed alternative.

Benefit/Cost Analysis:

1. Benefit/Cost Analysis: Annualized estimates of project costs and benefits will be developed and the benefit/cost ratio will be computed to identify the National Economic Development Plan.

The table provides a breakdown of tasks and costs for the Economics Section.

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
WO	Without Project Condition				
a	Population and Projection	4	\$ 3,700		\$ 3,700
b	Land Use Projections	4	\$ 3,700		\$ 3,700
c	Traffic Volumes	4	\$ 3,700		\$ 3,700
d	Detour Costs (Traffic Delay & Vehicle Operating Costs)	5	\$ 4,600		\$ 4,600
e	Emergency Costs & Other Potential Damage Costs	5	\$ 4,600		\$ 4,600
f	Meetings & Coordination	2	\$ 1,800	\$1,000	\$ 2,800
g	Prepare input for Without Project DPR Econ Appendix	8	\$ 7,400		\$ 7,400
h	Participate in Conference	1	\$ 900		\$ 900
I	Seamless Technical Review	1	\$ 900		\$ 900
	All task between these milestone above this line				
	Subtotal	34	\$ 31,300	\$1,000	\$ 32,300
W	With Project Condition				
a	Respond to Comments/Revise Without Project Analysis	3	\$ 2,800		\$ 2,800
b	Operating Costs	3	\$ 2,800		\$ 2,800
c	Traffic Delay Costs	3	\$ 2,800		\$ 2,800
d	Analysis of Other Potential Benefits (emerg costs, etc.)	5	\$ 4,600		\$ 4,600
e	Cost Benefit Analysis	3	\$ 2,800		\$ 2,800
f	Meetings & Coordination	2	\$ 1,800		\$ 1,800
g	Prepare Input for With Project DPR Econ Appendix	5	\$ 4,600		\$ 4,600
h	Participate in Conferences	1	\$ 900		\$ 900
i	Seamless Technical Review	1	\$ 900		\$ 900
	All task between these milestone above this line				
	Subtotal	26	\$ 24,000	\$ -	\$ 24,000

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
Final	Final Report				
a	Respond to Comments For With Project Analysis	3	\$ 2,800		\$ 2,800
b	Meetings & Coordination	2	\$ 1,800		\$ 1,800
c	Prepare Input for Final DPR Econ Appendix	3	\$ 2,800		\$ 2,800
d	Participate in Conferences	1	\$ 900		\$ 1,000
e	Financial Capability Statement	10	\$ 9,300		\$ 9,300
	All task between these milestone above this line				
	Subtotal	19	\$ 17,600	\$ -	\$ 17,700
Total Cost					\$ 74,000

Socioeconomics Studies/Report Total Cost \$74,000.00
(Federal \$ = / Non Federal \$ = / Non Federal In Kind Service =)

REAL ESTATE ANALYSIS / REPORT.

SCHEDULE DURATION: ~~XX/05~~, thru ~~XX/07~~

ESTIMATED TOTAL TASK COST : \$20,000.00

(Federal = \$ / Non Federal \$ = / Non Federal In Kind Service =)

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Preliminary Real Estate Assessment

Introduction:

This assessment will only cover the ingredients and likely cost estimate to prepare a Detailed Project Report (DPR) level of effort for the proposed study. At this stage in launching the study, the scope of work and needed products is based on preliminary and conceptual information. The range of alternatives includes 5 likely sites with crossing widths ranging between 1400 feet to over 2900 feet. At this reconnaissance level, estimates of the likely level of work and scope of the investigation must be expressed in general terms and be made flexible to future developments in the study. Also- Non – structural and No action alternatives are part of the analytical planning process. Non structural measures would include relocation of facilities or public or private buildings, flood warning systems, and/or floodplain management measures, emergency preparedness, and regulation of floodplain development to minimize recurring flood damages and flooding associated dangers. This introduction is inserted as a caveat to express that this is a preliminary assessment and depending on decisions reached in subsequent planning analyses, the real estate considerations, acquisition measures, and the requested products and their costs could take an entirely different path than what is known at this reconnaissance level assessment.

Project Sponsorship:

In all Corps of Engineers' Water Resources Development Projects, it is necessary to have a local sponsor acquire all "Lands, Easements, Rights-of-way, and perform Relocations. This is statutory requirement since *Public Law 99-662, the Water Resources Development Act of 1986*. Local or "Non Federal Sponsors' are required for all such Water Resources Development Act (WRDA) projects constructed with the participation and Federal funding through the U.S Corps of Engineers. The Non-Federal Sponsor is also required to participate in the Feasibility Report and also participate and provide a share of the projects' total costs. At this point, it is not known what type of Non-Federal sponsor might be involved, whether Gila County will come onto the project as a Non-Federal Sponsor, or whether the project might involve other entities dealing with Federal assistance for transportation improvements (roads and bridges) or the development of local infrastructure. All these uncertainties impact the accuracy of estimating the scope of the planned activities, their costs, and whether these are Federal costs or locally provided contributions.

Bridge- Crossings- Navigation Servitude:

One element to describe here only briefly is the ability to cross or make improvements below the ordinary high water line of a river or other such body of water for a public purpose connected with transportation, navigation or flood control. Although this concept will be treated in greater length in the DPR, it is worthy of noting here that bridge pillars, supports, and other such construction within the designated cross section of the Tonto Creek in order to bridge over this defined watercourse may not necessary result in the acquisition or diminution of existing property interests. This aspect will be more thoroughly researched and analyzed in the DPR. More specific treatment and determinations, including the extent and boundaries of the river, ownership of property in the riverbed, Federal and State laws governing the use and ownership of the riverbed, will be developed during the conduct of the study. Also to be considered are the offsetting benefits that the adjacent properties will realize from such a public improvement at the crossing site that could impact the approach to property acquisitions

The selection of a crossing site on U.S Forest Service property would negate any private property acquisitions

Real Estate Interests- Road Easements.

Road easements would be used for any bridge approaches located above and beyond the water line and hydraulic cross section of Tonto Creek. As the adjacent property remainder would likely realize offsetting benefits from the public improvement of a bridge crossing (increased traffic counts, accessibility, etc.) The cost of any such easements to the acquiring agency or public body are not expected to a significant part of the projects total costs. A local or State agency would actually obtain these road easements since future operation and maintenance would be the local agencies responsibility. A road permit or easement, if possible, would be obtained and issued by the United States Forest Service on USFS lands.

Parametric Estimate- DPR level of Effort:

Given the considerations and qualifiers expressed above, below is an estimate for preparing the Real Estate activities and likely products of a DPR level of effort for this study:

Rights-of entry (2 locations 5 -10 owners)	\$5,000
Appraisal and Review (per crossing/Bridge site)	\$2,000
(May be done for selected site or sites not disqualified in planning sequence)	
Compensability Opinion Bridge Crossing	\$5,000
Real Estate Appendix-DPR	\$5,000
Site Visits Coordination Meetings, etc.	\$2,000
Estimated Total	\$20,000

Real Estate Analysis/Report. Total Cost \$20,000.00
(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

ENVIRONMENTAL STUDIES / REPORT (Except USFWS)

SCHEDULE DURATION: ~~XX/05~~ thru ~~XX/07~~

ESTIMATED TOTAL TASK COST: \$

(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

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The tasks for the Environmental Studies will be performed by the Los Angeles District Environmental Resources Branch. The effort will include incorporation of information obtained from the Fish and Wildlife Studies and Cultural Resources Studies tasks.

The Environmental Studies Task include all efforts required to coordinate and develop the required NEPA, Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act, and Section 404(b)(1) documentation, including the necessary public notices. Additionally, the Environmental Evaluation (EE) prepared in the reconnaissance phase will be expanded into an Environmental Impact Statement (EIS).

Work performed in the subtasks will be documented in the Environmental Appendix.

A. Establish Without Project Conditions. The Corps is required to consider the option of "NoAction" as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). No Action assumes that no project would be implemented by the Federal Government or by local interests to achieve the planning objectives. No Action, which is synonymous with the Without Project Condition, forms the basis from which all other alternative plans are measured.

B. Establish Environmental Alternatives. The EIS will evaluate the environmental effects of the alternative plans. Baseline conditions for water quality, fish and wildlife, endangered species, and other pertinent environmental conditions will be adequately described so that an incremental analysis may be performed.

C. Documentation and Coordination. The report will be coordinated with Federal, State and local governments and agencies as well as interested groups and individuals. Preparation of the EIS will include ecological and biological support staff services, cultural resources support staff services, field reconnaissance where required, and coordination of U.S. Fish and Wildlife Service funding for the Fish and Wildlife Coordination Act Report.

The time and cost estimates for the tasks described below include allowances for coordinating with other study team members, attending meetings and sites visits, and preparing responses for independent technical review comments.

F3 Baseline Conditions: The Notice of Intent (NOI) to prepare an EIS will be prepared and sent to the Environmental Protection Agency for publication in the Federal Register. The Environmental Coordinator shall participate in the public scoping meeting. The existing baseline environmental conditions will be developed through review of background information on the project, site surveys, and coordination with appropriate resource agencies, as necessary.

F4 Internal Draft EIS: Provide input into alternative formulation and analysis of impact to environmental resources. Develop draft monitoring and adaptive management plan. Ensure compliance with environmental statutes, including Clean Water Act, Clean Air Act, and Endangered Species Act.

F5 Public Draft EIS: Revise F4 document per Independent Technical Review (ITR) and Quality Control (QC). Complete draft EIS and prepare the executive summary and public review mailing list for public review.

F9 Final EIS: Participate in public meeting. Participate in Issue Resolution Conference (IRC). Review and Respond to Comments from Public Meeting, Public Review, and ITR Comments. Prepare and circulate Final EIS.

Biological Resources: This section describes the effort required for the biological resources studies to support the Detailed Project Report (DPR) for a bridge crossing along Tonto Creek in Gila County, Arizona. The biological studies for this project will primarily focus on the biological resources that will be impacted by the bridge construction. The time and cost estimates for the tasks described below include allowances for coordinating with other study team members, attending meetings and sites visits, and preparing responses for independent technical review comments.

Without-Project Biological Resources Report. Baseline conditions for vegetation, fish and wildlife, endangered species, and other pertinent environmental conditions will be surveyed, mapped, and adequately described at a level appropriate to this study so that a Habitat Evaluation may be performed. Baseline conditions will be described based upon existing literature, aerial photographs, and on-site field surveys. This milestone will include characterization and mapping of the major habitat types within the

project area, surveys, and identification of dominant wildlife and wildlife groups present or likely to occur on site, and identification of areas of potential habitat and opportunities for ecological restoration. Baseline terrestrial and aquatic habitat types for the area will be evaluated using available information, aerial photographs, and comprehensive field surveys. A scientific habitat evaluation method, such as HEP or modified HEP, acceptable to the U.S. Fish and Wildlife Service (USFWS), Arizona Game and Fish Department (AGFD), the local sponsor, and U.S. Army Corps of Engineers will be used to assess habitat value for existing conditions and to project future without project conditions. This subtask will include selection of evaluation criteria, assigning values, field data collection, and analysis of data. The Corps will request information on Threatened and Endangered species from the U.S. Fish and Wildlife Service.

Alternative Impacts to Biological Resources. This task will involve biological resources input to the alternatives development process, evaluation of impacts of alternatives, development of mitigation measures where necessary, development of a monitoring plan, and completion of the habitat evaluation analysis process.

F4 Conference Comments. **Respond to F4 conference comments. Refine impact analysis for based on F4 conference comments.**

Draft NEPA Documents Biological Resources. Prepare Biological Assessment. Prepare Biological sections of NEPA document for public review.

Public Meeting/ Issue Resolution Conference. Provide input to the public meeting presenters, attend meeting, and respond to comments at the meeting as appropriate. Participate in Issue Resolution conference (IRC). Prepare written responses to public and ITR comments on biological resources sections of the Draft NEPA document.

Final NEPA Document Biological Resources. Where appropriate, revise the biological resources sections to incorporate comments from the ICR to finalize the NEPA document.

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
DPR	Environmental Studies (excl. USFWS)				
a	F3 Baseline Conditions	50	\$ 40,000	\$ 3,000	\$ 43,000
b	F4 Internal Draft EIS	40	\$ 30,000	\$ 2,000	\$ 32,000
c	F5 Public Draft EIS	24	\$ 18,000	\$ 4,000	\$ 22,000
d	F9 Final EIS	22	\$ 16,000	\$ 3,000	\$ 19,000
	SUBTOTAL	136	\$104,000	\$11,000	\$116,000
e	Biological Resources*	136	\$ 90,000	\$ 1,000	\$100,000
	TOTAL	272	\$194,000	\$12,000	\$216,000
f	Branch and Section Overhead (25%)				\$ 54,000
	GRAND TOTAL				\$270,000.00

* Cost does not include mitigation costs for any of the biological resources. Preliminary mitigation costs to be provided after initial impact analysis. Permit fees for any other agency are also not included.

Environmental Studies and Report. (Except USFWS) Total Cost \$270,000.00
(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

FISH AND WILDLIFE COORDINATION ACT REPORT

SCHEDULE DURATION: ~~XX/05~~ thru ~~XX/07~~

ESTIMATED TOTAL TASK COST: \$ 55,000.00

(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

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The Fish and Wildlife Studies will be conducted in accordance with the NEPA and the Fish and Wildlife Coordination Act. The work will be performed by a technical team which, at a minimum, consists of the US Fish and Wildlife Service (USFWS), the State of Arizona Game & Fish Department (AGFD), the Local Sponsor, the State of Arizona Department of Environmental Quality (ADEQ) and the U. S. Army Corps of Engineers (USACE). The technical team will perform data collection, species identification, habitat evaluation, and riparian mapping to arrive at the baseline conditions. Utilization of an appropriate methodology either Hydro-geomorphic Modeling (HGM) or Habitat Evaluation Procedures (HEP), the technical team will assist with development of project alternatives and evaluate any project induced environmental effects/benefits. The USFWS will develop Planning Aid Letters (PAL) and a draft and Final Coordination Act Report (CAR). The USACE will coordinate with USFWS to determine the scope of work required and will arrange for funds to be transferred to USFWS for their participation and preparation of the PAL's and the draft and final CAR.

SUBACCOUNT/TASK	COSTS
Participation in habitat evaluation to determine the baseline conditions and projection of the future without project; the evaluation of preferred alternatives	
Preparation of Final Planning Aid Letters	20,000
Preparation of Draft Coordination Act Report	20,000
Preparation of Final Coordination Act Report	15,000
Fish and Wildlife Coordination Act Report Total Cost	\$55,000.00 (Fed Cost)

CULTURAL RESOURCES STUDIES / REPORT

SCHEDULE DURATION: ~~XX/05~~ thru ~~XX/07~~

ESTIMATED TOTAL TASK COST: \$ 50,000.00

(Federal = \$ / Non Federal \$= / Non Federal In Kind Service =)

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Cultural Resources. The potential to encounter cultural resources within this 14-mile reach of Tonto Creek, along either bank or associated with the first and second terrace, or within close proximity to the conveyance corridor is high. Archaeological research suggests that Tonto Basin was inhabited by the Hohokam and Salado cultures from about 700 A.D. to 1400 A.D. An extensive eight-year archaeological project was undertaken between 1989 and 1996 as part of the effort to determine the impacts of modification to Theodore Roosevelt Dam and the realignment of State Route 188. Consultation with the State Historic Preservation Officer (SHPO) and relevant federally recognized tribes will be initiated and coordinated by the Corps of Engineers (COE) Environmental Resource Branch, Cultural Resource Specialist to determine the potential of encountering sites of religious or cultural significance with respect to the potential bridge setting location, the approaches and road alignment along the east side of Tonto Creek. More details with respect to cultural resource concerns and the expected level of coordination with the State Historic Preservation Officer (SHPO) are contained in the

Cultural Resource estimate to complete the Detailed Project Report and the Section 106 consultation. This future work would be incorporated as part of the Environmental Impact Statement (EIS) for this proposed project.

The following is a brief description of the tasks required for the preparation of the Detailed Project Report (DPR).

4.3.1 Regulatory Setting. The cultural environment includes those aspects of the physical environment that relate to human culture and society, along with the social institutions that form and maintain communities and link them to their surroundings. Section 101(b)(4) of NEPA established a federal policy of conserving the historic and cultural, as well as the natural, aspects of our national heritage. Regulations implementing NEPA stipulate that federal agencies consider the consequences of their undertakings, such as construction of a bridge over Tonto Creek, on historic and cultural resources (40 CFR Part 1502.16[g]). Federal undertakings include projects, activities, or programs funded in whole or in part by a federal agency, or requiring a federal permit, license, or approval. Regulations for *Protection of Historic Properties* (Title 36 CFR, Part 800) implement the NHPA by defining a process for demonstrating appropriate consideration of National Register- listed or eligible properties through consultation with State Historic Preservation Officers, the federal Advisory Council on Historic Preservation, and other interested organizations and individuals. Cultural resources are addressed in this EE in compliance with both NEPA and NHPA.

There are two principal methods of locating cultural resources. Before starting a project, a records and literature search is conducted at any number of repositories of archeological site records. The search may show that an archeological, or historical survey had been conducted and some cultural resources were identified. That information may be enough to proceed with the significance evaluation stage of the project. If a conclusion is reached that (1) no previous survey had been done, or (2) a previous survey was either out of date or inadequate, the project cultural resources expert, an archeologist, will need to carry out a pedestrian surface survey to determine if any cultural resources are within the proposed project boundaries.

After a cultural resource(s) has been identified a survey or record and literature search the Federal Agency overseeing the undertaking embarks on a process that involves determining if the cultural resource is eligible for listing in the National Register of Historic Places (National Register). Section 106 of the National Historic Preservation Act mandates this process. The Federal Regulation that guides the process is called 36 CFR800. For a cultural resource to be determined eligible for listing in the National Register it has to meet certain criteria. The resource has to be either minimally 50 years old or exhibit exceptional importance. After meeting the age requirement, cultural resources are evaluated according to four criteria: a, b, c, and d. The National Register criteria for evaluation as defined in 36 CFR 60.4 are:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master,

or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history.

After a cultural resource has been determined eligible for inclusion in the National Register it is accorded the same level of protection as a property that is included. It then becomes formally known as a "historic property" regardless of age.

4.3.2 Archaeological Investigations. An extensive eight-year archaeological project was undertaken between 1989 and 1996 as part of the effort to determine the impacts of modification to Theodore Roosevelt Dam and the realignment of State Route 188. The Roosevelt Rural Sites Study was conducted on behalf of the U.S. Bureau of Reclamation between 1991 and 1994. These studies, and continuing research in the Tonto Basin indicate the basin has been inhabited over the last several thousand years. Evidence of early occupations exists, but is rare due to flooding action overtime. The most common sites currently identified are those of the Hohokam and Salado cultures from about 700 A.D. to 1400 A.D.

The potential for discovery of archeological sites along the 14-mile reach of Tonto Creek that comprises the project area is high. This sensitivity includes areas adjacent to the creek, and on associated terraces, particularly stable pleistocene terraces, along the entire reach. Pedestrian surveys will be conducted of those areas proposed for the crossing approaches, road re-alignments, and staging areas. Consultation with the State Historic Preservation Officer (SHPO) and relevant Native American tribes and groups, to determine the potential of encountering sites of religious or cultural significance with respect to the potential bridge setting, will be initiated and coordinated by the Corps of Engineers (COE) Archeology staff.

4.3.3 Native American Concerns. Section 106 of the National Historic Preservation Act, the American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Act of 1990, and Executive Order 13084 of May 14, 1999: Consultation and Coordination with Indian Tribal Governments all require that government agencies consult with Native Americans to determine their interests in federal projects.

5.0 ENVIRONMENTAL IMPACTS

5.1 Bridge Location Alternatives

5.1.1 (1) Gun Creek, (2) Kayler Crossing, (3) Punkin/Sheep's Crossing, (4) Bar-X Crossing, (5) A-Cross Crossing.

5.1.2 Cultural Resources: There is the potential for adverse effects to National Register eligible historic properties. Avoidance is always the first choice of treatment for historic properties. Data recovery of historic properties is possible as mitigation, with the concurrence of the State Historic Preservation Officer (SHPO).

The following table is a breakdown of tasks, duration of effort and associated costs from Cultural Resources.

Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
DRAFT/FINAL ENVIRONMENTAL DOCUMENT					
a	Research, Collect and Review Data	10	\$ 11,000		\$ 11,000
b	Visit study area for survey of preferred alternative (s)	5	\$ 5,500	\$ 2,500	\$ 8,000
c	Organize Data	8	\$ 8,800		\$ 8,800
d	Attend and Participate in Meetings	1	\$ 1,100	\$ 500	\$ 1,600
e	Document existing and future with alternatives	3	\$ 3,300		\$ 3,300
f	Prep input to environmental document & draft appendix	5	\$ 5,500		\$ 5,500
g	Coordination/Consultation with SHPO	8	\$ 8,800		\$ 8,800
h	Coordination/Consultation with Native Americans	5	\$ 5,500		\$ 5,500
i	Revise Environmental document as needed	5	\$ 5,500		\$ 5,500
	Subtotal	50	\$ 49,500	\$ 3,000	\$ 58,000
Task Number	Task	Working Days	Labor Cost	Non-Labor Cost	Total
IF DATA RECOVERY REQUIRED					
a	Contract field work	7	\$ 7,700	\$ 100,000	\$107,700
b	Coordination/Consultation with SHPO	8	\$ 8,800		\$ 8,800
c	Coordination/Consultation with Native Americans	5	\$ 5,500		\$ 5,500
d	Attend and Participate in Meetings	2	\$ 2,200	\$ 1,000	\$ 3,200
e	Review of technical reports (research design, draft & final report)	7	\$ 7,700		\$ 7,700
	Subtotal	29	\$ 31,900	\$101,000	\$132,900
	TOTAL	79	\$81,400	\$104,000	\$190,900

Cultural Resources Studies / Report Total Cost \$ 50,000.00

(Anticipating No Data Recovery Required and that the scope of work would be for the two preliminary optimal locations.)

(Federal \$ = / Non Federal \$ = / Non Federal In Kind Service =)

COORDINATION OF PUBLIC INVOLVEMENT

SCHEDULE DURATION: ~~XX/05~~ thru ~~XX/07~~

ESTIMATED TOTAL TASK COST: \$22,000.00

(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

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1. Purpose. The goals of these tasks are: 1) promote understanding of the Corps planning and project implementation process; 2) obtain public input regarding problems, opportunities, constraints, alternatives, outputs, impacts and costs; 3) coordinate planning effort with efforts of other Federal, state and local agencies.

2. Subtasks.

1.) Public Involvement Plan. Public involvement techniques will be decided and a schedule with specific milestones will be developed into a Public Involvement Plan. During the formulation of the Public Involvement Plan, the number and types of meetings, workshops, and newsletters will be determined. A mailing list will be prepared to include all potentially interested parties.

2.) Conduct Initial Public Workshop. An initial public meeting will be held early in the process and is scheduled to serve to announce and introduce the study to interested parties. The initial public meeting will be part of the required NEPA process for scoping of the Environmental Impact Statement (EIS). Scoping issues, concerns, and opportunities will be discussed. Public input will be obtained and incorporated into the plan formulation process and the EIS.

3.) Information Dissemination. All interested parties will continue to be informed of the progress of the study through news releases, newsletters, and telephone contacts. Prior to the Final Public Meeting, the Draft Feasibility Report will be released for public review and comment.

4.) Conduct Final Public Workshop. A Final Public Meeting will be held to present the findings of the Draft Feasibility Report and Draft Environmental Impact Statement. Direct comment from the public will be obtained for incorporation into the Final Report and Final EIS.

5.) Documentation. The end product of the Coordination and Public Involvement Task will be to summarize the information obtained into a Public Involvement Appendix to the Final Feasibility Report.

~~6.) Presentations and the preparation of Graphics and Display Boards.~~

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The following is an estimate of the tasks and costs associated with J1000:

SUBACCOUNT/TASK	COST
1: Public Involvement Plan	2,000
2: Conduct Initial Public Workshop	2,000
3: Information Dissemination	4,000
4: Conduct Final Public Workshop	2,000
5: Documentation	2,000
6: Presentations and Graphics and Display Boards	10,000
Coordination and Public Involvement TOTAL	\$22,000

Comment [LAD6]: Please review and insure that this is the correct amount for the related tasks, the draft 4 WBS# Description sheet I was provided shows total cost of \$150,000 a \$50,000 dollar difference.

PLAN FORMULATION AND EVALUATION

SCHEDULE DURATION: ~~XX/05~~ thru ~~XX/07~~

ESTIMATED TOTAL TASK COST: \$ 70,000.00

(Federal = \$ / Non Federal \$= / Non Federal In Kind Service =)

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Plan formulation includes reviewing and refining the plans selected for study during the next phase and other plans developed during the course of the separate Technical Evaluations and Analyses to develop and complete the Detailed Project Report (DPR). The local alternatives will be further developed during the development of the DPR and compared for completeness, effectiveness efficiency and acceptability, and will include consideration of all applicable Gila County Public Services or Flood Control Policies related to Flood Damage Reduction, Flood Conveyance and/or this potential Structure.

The annual and periodic activities and responsibilities for operating and maintaining (O&M) the completed project will be described and closely coordinated with other requirements (e.g., cost estimates and monitoring). The general magnitude of these activities will be described for all alternatives in detail; however, more detail will be provided for the alternative recommended for implementation. All requirements of 33 CFR 208 and other Federal regulations specifying operation and maintenance requirements will be clearly described so that the Sponsor's future responsibilities will be known.

Plan formulation will ensure that the report is prepared in accordance with ER 1105-2-100, ER 5-7-1, EC 1105-2-206, EC 1105-2-208, P&G, NEPA, and other pertinent engineering, environmental, and economic guidance and regulations.

The following activities will be accomplished:

- 1.) Prepare an assessment of existing conditions. A detailed assessment of present conditions will be used as a baseline reference against which future without project and with-project conditions are contrasted. The assessment will describe Land Use Changes in the Study Area and incorporate a history of Flood Damages and Public Health and Safety issues and concerns in the Study Area and those associated with the existing fords, low-water crossings. The assessment will include mapping.
- 2.) The physical, economic and institutional constraints to be considered in developing the alternative measures will be defined. This includes identification of all permits required to implement the plan and the responsible party for acquiring permits.
- 3.) Alternative measures or groups of measures for the Special Study will be identified and analyzed. Alternatives will be specific, defined alternatives with costs and outputs that can be estimated with reasonable accuracy. Costs are to be developed in sufficient detail to define each separable element of each alternative measure or group of measures before being submitted to the plan formulator. Costs will include construction costs, land acquisition and operation and maintenance.
- 4.) A recommended plan will be selected and clearly justified, based on Flood Damage Reduction and Public Health and Safety benefits with consideration to include the ability to implement, public acceptability and other factors.

5.) Implementation Studies involve determining the financial and legal arrangements required to implement the recommended plans and to examine whether or not the Sponsor has the organizational, legal, and financial capability to undertake the required financial obligations for the operation and maintenance that may be required. Financial Planning, this subtask will begin with a review of the reconnaissance study assessment of local financial interest and capability. Cost sharing, alternative repayment options for any incidental project purposes, and other financial options will be defined.

6.) Study management includes all study, project, and program activities, in accordance with current guidelines outlined in ER 1105-2-100, ER 5-7-1, EC 5-1-48, EC 1105-2-206 and EC 1105-2-208 providing detailed information for the work done for others, coordinates with Project Management on technical requirements of Engineering Division, establishing study milestones, developing networks to include work activities, task schedules, critical path networks and funding schedules, directing, monitoring, and modifying assigned work items as required and agreed upon by the Sponsor. Reviewing results and reports provided by the technical support staff, correspondence, report preparation and review, inter-organization coordination, as well as conference preparation and presentation. Coordinate with the Project Manager involving periodic meetings with Sponsors to report on technical issues and status of the study, in-kind services and credits. Study Team meetings will be held quarterly or more frequently if necessary.

Study management will ensure all required tasks and coordination is performed, resulting in production of a comprehensive Detailed Project Report document. Technical coordination and inter-disciplinary planning are the responsibilities of the Study Manager. Study management will monitor the scope and progress of activities of the study to ensure the study remains on track, within budget and on schedule, any potential impacts on scope, schedule, and cost are fully coordinated and resolved.

7.) The Study Manager will serve as coordinator among the various engineering functions to provide quality assurance, appropriate technical representation and participation in study team meetings, resolve technical issues, and insure products are delivered in a timely manner, manage budgets and schedules, and report on study status.

8.) Coordination, oversight, participation and preparation associated with the Public involvement component of the Study and coordination with other Agencies.

9.) Conduct and prepare briefings, schedule and attend meetings and issue resolution and response to comments received during the study.

10.) Final Report coordination and documentation.

The following estimate of tasks, days and costs associated with Plan Formulation:

SUBACCOUNT/TASK	DAYS	COST
1 Prepare Existing Conditions	2	
1 Quantify Without-Project Conditions	2	
2 Identify Opportunities & Constraints	2	
3 Lead Plan Formulation Effort	20	

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3 Lead Report Prep	16	
4 Technical Coordination/Oversight	12	
4 Coordinate Environmental Compliance	8	
4 Engineering Liaison Reporting	2	
5 Corps/Sponsors Liaison	6	
6 Manage Study and Schedule	14	
7 Coordinate Tech Team	8	
7 Coordinate Agencies	4	
8 Public involvement	4	
9 Conduct/Prepare Briefs	4	
9 Issue Resolution	2	
10 Final Report documentation and Coordination	5	
Coordination of Project Mgt Plan		
Contingency		
	112-Days	\$70,000.00

Plan Formulation and Evaluation Total Cost \$ 70,000.00
(Federal \$ = / Non Federal \$= / Non Federal In Kind Service =)

Comment [LAD7]: This should probably be like \$500,000 to \$520,000.

FINAL REPORT DOCUMENTATION

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL COST: \$10,000.00
(Federal =\$5,000.00 /In Kind =\$0 /Sponsor Cash =\$5,000.00)

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The Los Angeles District Planning Section C will perform the Report Preparation Task. The work will be in accordance with ER 1105-2-100, Chapter 2, EC 1105-2-206, EC 1105-2-208 and ER 110-2-1150, paragraph 10c. Report preparation includes compilation of all study team products into an initial draft report and a final report. Work will include collection and assembly of pertinent data, writing, editing, drafting, reviewing, revising, reproducing, and distributing of draft and final Detailed Project Reports, Environmental Impact Statement, and related technical documents and appendices.

Planning Section C will be responsible for reproduction and dissemination to facilitate review and revision. All study team members will be involved in the formulation and review of the reports. A Feasibility Review Conference and two comment periods will be held to assure all comments/views are incorporated.

This task also includes any possible requirements for additional rewriting, unforeseen technical modifications, reformulation, or documentation as a result of the Washington-level review process, which take place outside of the end of the feasibility phase (i.e., submittal of the report to the OMB by the ASA).

SUBACCOUNT/TASK	DAYS	COST
Compile Technical Team Products	20	
Compose Body of Feasibility Report	120	
Review and Edit		L/S
Reproduction	L/S	
Distribution	15	
Report Preparation Total Cost		\$10,000

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INTERNAL TECHNICAL REVIEW DOCUMENTS (QA/QC)

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL TASK COST: \$35,000
(Federal =\$ /In Kind =\$ /Cash =\$)

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1. Objective.

The quality control objective is to achieve feasibility phase documents and services that meet or exceed customer requirements, and are consistent with Corps policies and regulations. This work includes all costs associated with Corps internal technical review of study products to assure that technical products and processes comply with law, policies, regulations and sound technical practices of the involved disciplines. The independent evaluation will focus on whether the technical results of the study are reasonable for reaching a decision on whether there is potential for project implementation.

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1.1 Value Engineering Study ~\$25,000

2. Guidelines to Follow.

The guidelines for independent technical review are set forth in the South Pacific Division Quality Management Plan, CESP R 1110-1-8, and in the corresponding District Quality Management Plan.

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3. The roster of the Corps Technical Study Team is presented in the following table.

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Organization/Function	Name/Title	Address	Phone
Project Management	Kim Gavigan	Phoenix	(602)-640-2004
Programs	Norma DeHaro	Los Angeles	(213) 452-4025
Study Manager	Bryon Lake	Phoenix	(602) 640-2004
Plan Formulator	Bryon Lake	Phoenix	(602) 640-2004
Geology	Christopher Sands	Los Angeles	(213) 452-3605
Civil Design	Christopher Tu	Los Angeles	(213) 452-3634
Hydrology/Hydraulics	Coung Ly	Los Angeles	(213) 452-3566
Economics	Jeannie Hogg	Los Angeles	(213) 452-3816
Structural Engineer	John Lei	Los Angeles	(213) 452-3699
Cost Engineering	Juan Dominguez	Los Angeles	(213) 452-3737
Environmental	Chris Serjak	Los Angeles	(213) 452-3865
RE Appraisal	Steve Gale	Phoenix	(602) 640-2016
RE Acquisition	Steve Gale	Phoenix	(602) 640-2016
Cultural Resources	Pam Maxwell	Los Angeles	(213) 452-3877
Biological Resources	Gail Campos	Los Angeles	(213) 452-3874

The Corps Technical Review Team is presented in the Table below. (To Be Determined)

Organization/Function	Name/Title	Phone Number
	Review Team Leader	
	Planning	
	Hydraulics	
	Hydrology	
	Environmental Resources	
	Economics	
	Cultural Resources	
	Geotechnical	
	Real Estate	

4. DOCUMENTS TO BE REVIEWED AND SCHEDULE FOR REVIEW ACTIVITIES

a. All of the products of the tasks listed in the detailed scopes of work will be subject to independent technical review. Seamless Single Discipline Review will be accomplished prior to the release of materials to other members of the study team or integrated into the overall study. Section chiefs shall be responsible for accuracy of the computations through design checks and other internal procedures, prior to the independent technical review.

b. Independent product review will occur prior to major decision points in the planning process at the CESP milestones so that the technical results can be relied upon in setting the course for further study. These products would include documentation for the CESP mandatory milestone conferences (F3 & F4), HQUSACE issue resolution conferences (AFB & FRC) and the draft and final reports. These products shall be essentially complete before review is undertaken. Since this quality control will have occurred prior to each milestone conference, the conference is free to address critical outstanding issues and set direction for the next step of the study, since a firm technical basis for making decisions will have already been established. In general, the independent technical review will be initiated at least two week prior to a CESP mandatory milestone conference and at least two weeks prior to the submission of documentation for a HQUSACE issue resolution conference.

c. For products that are developed under contract, the contractor will be responsible for quality control through an independent technical review. Quality assurance of the contractor's quality control will be the responsibility of the District.

5. DEVIATIONS FROM THE APPROVED QUALITY MANGEMENT PLAN

The South Pacific Division has approved the following deviations to the approved quality management plan:

- None

6. PMP QUALITY CERTICATION

The Chief, Planning Division has certified that 1) the independent technical review process for this PMP has been completed, 2) all issues have been addressed, 3) the streamlining initiatives proposed in this PMP will result in a technically adequate product, and 4) appropriate quality control plan requirements have been adequately incorporated into this PMP. The signed certification will be included as Enclosure D.

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7. FEASIBILITY PHASE CERTIFICATION

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The documentation of the independent technical review shall be included with the submission of the reports to CESP. Documentation of the independent technical review shall be accompanied by a certification, indicating that the independent technical review process has been completed and that all technical issues have been resolved.

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The certification requirement applies to all documentation that will be forwarded to either CESP or HQUSACE for review or approval. The Chief, Planning Division will certify the pre-conference documentation for the HQUSACE issue resolution conferences and the draft feasibility report. The final detailed project report will include the signed recommendation of the District Commander. The District Commander will also certify it.

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This certification will follow the CESP Quality Management Plan and will be signed by the Chief, Planning Division and the District Commander.

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PROJECT MANAGEMENT and BUDGET DOCUMENTS

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL COST: \$ 10,000.00
(Federal =\$ / Sponsor Cash =\$)

Programs Management

This task involves preparation of the Federal budget for current year and future years. Includes monitoring cost and accounting allocations in coordination with the Study Manager and Project Manager.

Project Management, Planning Division and Plan Formulation Branch Management

Project Manager is the primary point of contact and responsible for development and negotiation of the PCA, MOA's and other customer agreements. Periodic meetings will be held between the Corps and the Sponsor to report on the status of the study and responsible in-kind services and credits. Planning Division and Plan Formulation Branch managers will provide technical and policy oversight during the study and participate in meetings with the sponsor and other District divisions. Status reports that cover selected financial measurements and performance will be provided each month by the project manager.

Budgetary management responsibilities include tracking and documenting the funds and budget (accounting) of the study; documenting appropriations, including interpretation of current and future budgetary guidance; submitting project data sheets, justification sheets and other testimonial fact sheets as required; monitoring and reprogramming study funds, executing current year and future funds; processing schedules of obligations and expenditures; monitoring project financial performance and coordinating with study and project managers on project financial performance; assessing District manpower allocations versus available funds, assuming district operating budget includes appropriate hired labor and contract amounts; coordinating future funds allocations and manpower requirements with other District elements; setting up and documenting all cost key accounts, and reviewing pre-and post-labor reports.

The Project Manager will coordinate with the sponsor for the management of negotiated in-kind services and coordination with Corps review, coordination of cost-sharing procedures, and management of budgets and schedules for the study. Negotiation of tasks and costs, review of reports, and participation in meetings on study results and issues are included in this task.

The following is an estimate of the tasks, days and costs for Programs Management:

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SUBACCOUNT/TASK	DAYS	Federal	In Kind
Budget Reporting	L.S.		
Project Management Division	L.S.		
Planning Division	L.S.		
Coordinate Milestones/FCSA	05		
Manage Study Progress	15		
Coordinate Technical Interface	15		
Manage Budget Alloc & Expend	40		
Upper Mgt Reporting	25		
Manage In-Kind Services	20		
Closeout Study Costs	15		
Sponsor Coordination and Review	_____		<u>20 days</u>

Project Management and Budget Documents Total Cost \$10,000.00
(Federal =\$ /In Kind =\$ /Sponsor Cash =\$)

CONTINGENCIES

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL TASK COST: \$~100,000.00
(Federal =\$ / Sponsor Cash =\$)

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A contingency amount has been placed on the feasibility study cost. The purpose of applying a contingency is to allow for changes in the cost estimates for the various work items, should the actual work reveal that additional effort is needed. The contingency amount applies to both Corps in-house efforts as well as in-kind services. This contingency would be applied based upon the recommendations from the feasibility study team and approved by the feasibility Executive Committee.

Programs and Project Management Division of the Los Angeles District will be responsible for monitoring and reporting budgetary progress.

PROJECT MANAGEMENT PLAN (PMP)

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL COST: \$10,000.00
(Federal =\$ /In Kind =\$ /Sponsor Cash =\$)

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Project Management Plan:

When the study results in a plan recommended for Federal participation, the plans and procedures required for project implementation are defined in a Project Management Plan (PMP). The PMP describes the scope, schedule and cost of the design phase and the construction phase. The PMP will include preparation of pre/post construction hydraulic data collection plans; preparation of a water quality control plan (if found necessary); and the coordination of O&M studies that need to be completed. Management activities will also include coordination and documentation of all M-CACES-generated estimates and revisions to these estimates. The Project Management Plan (PMP) will cover tasks, schedules, costs and management framework and direction for the project through completion of construction.

PED COST SHARE AGREEMENT

SCHEDULE DURATION: / thru /
ESTIMATED TOTAL COSTS: \$15,000.00
(Federal =\$ /In Kind =\$ /Sponsor Cash =\$)

CHAPTER IV – RESPONSIBILITY ASSIGNMENTS

1) ORGANIZATIONAL BREAKDOWN STRUCTURE

The scopes of work represent agreements between the Project Manager and first line supervisors of functional organizations. The functions of these organizations in support of the project are defined by the work that is assigned. All organizations responsible for tasks, including the local sponsor and other agencies, are included in the following Organizational Breakdown Structure.

2) RESPONSIBILITY ASSIGNMENT MATRIX

The scopes for each task are grouped by the parent task that they support and the primary responsible organization for each parent task would be outlined in the following Responsibility Assignment Matrix.

Task #	Description	Agency	Sponsor	Other
	Surveys and Mapping except Real Estate		sponsor	
	Hydrology and Hydraulics Studies/Report		sponsor	
	Geotechnical Studies/Report		sponsor	
	Engineering and Design Analysis/Report		sponsor	
	Socioeconomic Studies		sponsor	
	Real Estate Analysis/Report		sponsor	
	Environmental Studies/Report (Except USF&WL)		sponsor	
	Fish and Wildlife Coordination Act Report		-	USF&WL
	Cultural Resources Studies/Report		sponsor	
	Cost Estimates		sponsor	
	Public Involvement Documents		sponsor	
	Plan Formulation and Evaluation		sponsor	
	Final Report Documentation			
	Technical Review Documents		sponsor	
	Project Management and Budget Documents			
	Contingencies		sponsor	
	Project Management Plan (PMP)		sponsor	
	PED Cost Sharing Agreement		sponsor	

CHAPTER V – STUDY SCHEDULE

1. SCHEDULE DEVELOPMENT

The schedule is based upon the tasks that are listed in Chapter III, Work Tasks. The durations are included in the Work Tasks and in Chapter V, Study Schedule. Major milestones that are defined in Appendix C, CESPd Milestone System, are also included in the schedules.

2. FUNDING CONSTRAINTS

Funding for the first Fiscal Year of the feasibility study is normally limited because of the uncertainty in the initiation. This constraint has been reflected in the development of the study schedule. Following the first year, an optimum schedule based upon unconstrained funding has been assumed for subsequent Fiscal Years.

3. SCHEDULE AND MILESTONE COMMITMENTS

Milestones become commitments when the project manager meets with the local sponsor(s) at the beginning of each Fiscal Year and identifies two to five tasks that are important for the district to complete during the Fiscal Year. These commitments would be flagged in the PROMIS database and monitored and reported on accordingly.

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MILESTONE SCHEDULE

Milestone	Description	Duration Months (est.)	Baseline Start	Baseline Fin
Milestone F1	Initiate Study	0		
Milestone F2	Public Workshop/Scoping	2		
Milestone F3	Feasibility Scoping Meeting	5		
Milestone F4	Draft Feasibility Report	3		
Milestone F5	Final Public Meeting	1		
Milestone F8	Final Report to SPD	2		

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CHAPTER VI – STUDY COST ESTIMATE

1. BASIS FOR THE COST ESTIMATE

a. The feasibility cost estimate is based upon a summation of the costs that were identified for the individual tasks in detailed scopes of work that are included in Enclosure C, Detailed Scopes of Work. Study cost estimates include allowances for inflation so that the non-Federal sponsor is fully aware of its financial commitment.

b. Appropriate contingencies and contingency management are included to adequately deal with the uncertainty in the elements of the study. Experience has shown that a significant amount of the study costs should be reserved for activities after the release of the draft report. Contingencies, primarily for activities after the draft report, have been added to the cost estimate.

2. COSTS FOR FEDERAL AND NON-FEDERAL ACTIVITIES

The non-Federal sponsor must contribute 50 percent of the cost of the study during the period of the study. The non-Federal share may be made by the provision of services, materials, supplies or other in-kind services necessary to prepare the feasibility report. The feasibility cost estimate below includes credit for work that is to be accomplished by the non-Federal sponsor.

A Summary of the Overall Cost Estimate for Future Work to complete the Tonto Creek Special Study Detailed Project Report.

Description	Federal \$	In Kind \$	In Kind Service	Total
Surveys and Mapping except Real Estate				35,000
Hydrology and Hydraulics Studies/Report				100,000
Geotechnical Studies/Report				80,000
Engineering and Design Analysis Report				60,000
Structural Analysis				50,000
Socioeconomic Studies				74,000
Real Estate Analysis/Report				20,000
Environmental Studies/Report (Except USF&WL)				270,000
Fish and Wildlife Coordination Act Report				55,000
Cultural Resources Studies/Report				50,000
Cost Estimates				40,000
Public Involvement				22,000
Plan Formulation and Evaluation				70,000
Final Report Documentation				10,000
Technical Review				35,000
Project Management and Budget Documents				10,000
Contingency, approximately 10% of the total study cost.				100,000
Project Management Plan (PMP)				10,000
PED Cost Sharing Agreement				15,000
Total				1,106,000

3. SUMMARY OF COORDINATION, PUBLIC VIEWS AND COMMENTS.

(1) **Coordination.** Throughout a study, the Corps of Engineers strives to inform, educate, and involve the many groups who may have an interest in the study. This coordination is paramount to assuring that all interested parties have the opportunity to be part of the study process.

One process used for coordination is the public involvement process. Public involvement is the exchange of information with various segments of the public. It attempts to reduce unnecessary conflict and achieve consensus by opening and maintaining channels of communication with the public in order to give full consideration to public views and information in the planning and decision-making process. Content analysis is the method employed to identify public opinion, study concerns and potential controversy. It ensures that the public involvement plan is responsive to the level of interest and concern expressed by the public and it assesses the effectiveness of the public involvement techniques.

(2) **Public Views and Comments.** In previously completed studies and evaluation reports, there were three preliminary local alternatives proposed for the bridge location on this lower reach of Tonto Creek. These alternatives were reviewed along with two additional location proposed by Gila County Flood Control. This review was conducted at a reconnaissance level of investigation in order to determine the extent and level of detail of the existing information available. From this review determine what information was available and what level of effort would be required to fill gaps in the existing data set. The primary forum for receiving comments during this part of the study was through coordination with what was titled the "Steering Group" for this study. The Steering Group was comprised of representatives from the following Agencies and Organizations: Arizona Congressional District 1; Arizona Department of Transportation; Arizona Game and Fish Department; Gila County Board of Supervisors; Gila County Emergency Services; Gila County Flood Control District; Gila County Public Works; Federal Highway Administration; Salt River Project; U.S. Forest Service, U.S. Fish and Wildlife Service, the Tonto Basin Chambers of Commerce and two community representatives provided by the Chamber of Commerce.

A broader forum for soliciting comments was a public open house and presentation. The open house attendees were offered and provided the opportunity to take several 3x5 cards and a pencil to provide written comments or anonymous comments if they chose to. Additionally, there was a little more than hour at the end of the presentation during which questions and comments were recorded and addressed.

The notification of the open house, (An informational meeting with the public) was distributed to the local media outlets, posted at the post office and on other community bulletin boards and in a local weekly circular. Members of the Steering Group also provided notification through electronic messages to other Federal, State, County and Local Officials and the business community and public. The purpose of the open house was to meet with the public to exchange information about the Special Study, the study request; the intent of the study; the potential benefits and problems that may be associated with any of the alternatives.

The open house was held on May 25th, 2004, in Punksin Center at the Tonto Basin Elementary School from 5:00 P.M. to 7:00 P.M. There were 140 participants from the community in attendance at the open house. Public question and comments were recorded during the open house as well as the responses. These comments and question were captured and addressed in the minutes from this meeting. The minutes were distributed to the Corps of Engineers Technical Study Team and the Steering Group and were available to the public through the Tonto Basin Chambers of Commerce or from Gila County. A summary of these question and comments are contained in Appendix E.

The comments received at the open house were provided to the Technical Study Team Members for consideration and use in their evaluation and analyses of the five locally provided potential alternative locations for setting the purposed bridge.

The following is a brief synopsis of some recommendations from the steering group. This group believes there would be utility in holding a meeting with the potential local sponsor(s), the Gila County Board of Supervisors, other stakeholders and Arizona Congressional District 1. The steering group feels this would help by not only showing the level of local support but also provide an avenue for further discussion on how they can support this effort. Other recommendations include; the suggestion of potential Homeland Security opportunities as an alternate route if something where to happen at Roosevelt Dam or with the bridge at that location, to determine if the \$300,000.00 dollars that was provided for a low-water concrete apron for the A-Cross/Redhill ford that was to be provided as part of the Roosevelt Dam modification years back. The steering group and Gila County would like to be provided the information on how to go about obtaining and emergency permit through the Corps of Engineers Regulatory Branch that would allow for a temporary bridge structure as part of an Emergency Action Plan, (EAP). The final recommendation was that a revised version of the Problems and Opportunities map be provided as part of the final packet, along with a CD of the report document, images and presentations.

A summary of responses from the comment card from the final public meeting is also contained in Appendix E.

(3) Completion of the Document. The study kicked off with two scoping meetings and a request for clarification, from Arizona Congressional District 1, of the language provided by Congress with respect to the Congressional intent and end products desired from this study. The results of the scoping meetings and direction from Congressman Renzi's Office were refined into the Scope of Work developed for this study and the associated end products of the study. A mid-point (interim) review of the "in progress" document was completed July 16th, 2004, with participation from Arizona Congressional District 1; Arizona Game and Fish Department; Arizona Department of Transportation; Gila County Board of Supervisors; U.S.F.S. Tonto Basin Ranger District; U.S. Fish and Wildlife Service and the Federal Highways Administration. Additionally, a copy of the "rough-Final" version of the Document was provided to the Technical Study Team with a solicitation for comment in August 2004. A final meeting of the "steering group", (other State, Local and Federal Agencies) was held on 13 September 2004 to provide an opportunity for a review of the final version of the document and provide and discuss any final comments. Additionally, this group finalized the coordination effort for the Final informational meeting with the public, scheduled 23 September 2004. Upon completion

of the final meeting with the public, any comments and questions will be addressed and incorporated into the above section addressing public views and comment. Final coordination and preparation of the document will be completed prior to 29 September 2004 and the Final Document will be submitted to Arizona Congressional District 1; the Gila County Board of Supervisors and Gila County Public Works by 30 September 2004.

(4) Summary. The goals of the coordination process for the Tonto Creek, Tonto Basin, Arizona Special Study were to inform, educate and involve the public and solicit feedback through open communication and include in the plan formulation process all of the interested and affected public. These goals were met by providing Local officials, representatives and the public opportunities to become informed about, and involved in, the study by providing feedback to the study team. The study team to shape the plan formulation process and to develop the plan utilized this feedback. The public involvement process has influenced the study plan that comprises a large portion of this report document.

As a result of the evaluations, analyses, public involvement and the professional judgment of the Interagency Steering Group and the Technical Study Team; of the five proposed locations, the two preferred preliminary optimal locations for the proposed bridge setting are the Punkin Center/Sheeps Crossing and the Kayler Crossing locations. The Punkin Center/Sheeps alternative was the number one choice with consideration given to the close proximity to the population center the limited road alignment required and the consideration of environmental impacts. Kayler Crossing was the second highest ranked location. This location was ranked nearly equal to the Punkin/Sheeps alternative by the technical study team and the steering group, however, the local community and public input provided overwhelmingly ranked the Punkin Center/Sheeps location as their number one preference.

The cost estimates and scopes of work outlined in the Project Management Plan were developed under the assumption this would proceed through the U.S. Army Corps of Engineers process with respect to the further engineering and design analysis and to complete the environmental documents. This document provides an overview of the problems, opportunities, issues and concerns associated with the proposed bridge. Additional, it outlines the remaining technical studies and analyses that the U.S. Army Corps of Engineers would need to complete in order to fulfill the requirements of the Corps evaluation and plan formulation process.

Of the five locally proposed bridge setting location alternatives it has been determined through this reconnaissance level investigation and with participation from the interagency steering group and public involvement; that the two preliminary optimal locations that warrant future considered with respect to further engineering and design analyses for the proposed bridge setting should be limited to the Punkin Center/Sheeps Crossing or the Kayler Crossing alternative locations.

In Conclusion, as a result of the Internal Technical Review, the area defined for further study and analyses would appear small enough to be considered under the U.S. Army Corps of Engineers Continuing Authorities Program, Section 205.

The recommendation for the final coordination of this document is a transmittal letter from the District Engineer to Congressman Renzi and Gila County as a notice of completion of this special study.

**Environmental Evaluation
for
Tonto Creek, Gila County, Arizona**

18 August 2004

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1.0 Introduction

This environmental evaluation has been prepared to identify potential environmental effects associated with several alternative locations for a proposed bridge crossing over Tonto Creek in Gila County, Arizona. This study is undertaken through a Congressional Request to the U.S. Army Corps of Engineers (Corps) as a Special Study.

1.1 Scope of Environmental Evaluation

This environmental evaluation has been developed to identify potential environmental issues within the study area, and potential effects of the proposed potential project as compared with the future without project conditions. Identification of environmental resources includes biological, cultural, land use, recreation, water quality, air quality, noise, and aesthetics. This reconnaissance level environmental evaluation is based on readily available data and input from the study team. This environmental evaluation is not intended to satisfy the requirements of the National Environment Policy Act (NEPA). More detailed investigation and analysis is expected to be undertaken during the feasibility phase.

1.2 Study Area

Tonto Creek is a major tributary of the Salt River, located in Gila County, Arizona. It extends from the Mogollon Rim, at the top of the watershed, south to its confluence with the Salt River at Roosevelt Lake. The contributing drainage basin of the creek encompasses an area of approximately 955 square miles. The upper reaches are generally undeveloped, with a primary cover of pine and juniper trees. The lower reaches border on such residential and business developments as the community of Punkin Center, near Roosevelt Lake.

To facilitate analysis for this study, the Tonto Creek drainage basin is divided into two main sections. The upper section is defined to include the portion of the basin extending above the stream gage located just north of the confluence of Gun Creek and Tonto Creek. This upper basin encompasses approximately 675 square miles, and has a main channel length of 34.4 miles. The lower section is that extending below the stream gage, to the confluence of Tonto Creek and the Salt River at Roosevelt Lake. This lower section is the focus of this study. It has a drainage area of 236.6 square miles and a main channel length of approximately 14 to 16 miles.

Three primitive low-water crossings, or fords, are presently used to cross Tonto Creek during low flow regimes. They are referred to as the “upper-crossing”, the “middle-crossing” and the “lower-crossing”. The upper crossing is located at Punkin Center. The middle crossing, known locally as the “Bar-X Road”, is located approximately 3.6 miles south of the upper crossing at Punkin Center. The lower crossing, known locally as the “A-Cross Road”, is located approximately 2.7 miles south of the “Bar-X Road”. The lower crossing, A-Cross Road, will be directly affected operations planned upon completion of ongoing modifications to raise Roosevelt Dam and increase storage. The new planned operating pool elevation for the reservoir will be 2,151 feet, which will inundate the existing lower crossing located at approximately 2,146 feet, during flood events.

1.3 Purpose and Need

Regular seasonal flooding of Tonto Creek results in a lack of safe access and inconvenience for residents along the east side of the creek. Flooding can render Tonto Creek impassable for an average of 2 to 3 weeks per flooding event, and up to 6 weeks during major floods.

2.0 Alternative Plans Considered

The project team has identified five alternative sites for a potential bridge crossing. These locations include the three existing low water fords: (1) the Upper Crossing (Punkin Center); (2) the Middle Crossing (Bar X Road); and (3) the Lower Crossing (A-Cross Road). Two additional sites have been proposed by Gila County staff, which are (4) Gun Creek, and (5) Kayler Crossing (South of Park Creek). This evaluation also considers the No Project Alternative wherein no bridge would be constructed, and residents would continue to use the existing low-water crossings to access their communities.

3.0 Existing Environment

3.1 Biological Resources

Vegetation

Vegetation in the Tonto Creek area is primarily upland desert scrub on the hills bordering the Creek and riparian plant communities within Tonto Creek and its tributaries. Vegetation composition and structure have been influenced by a variety of land use practices including vehicle traffic, grazing, recreation, and development in and around the Tonto Creek area.

Upland vegetation in the Tonto Creek area is characteristic of the Arizona upland subdivision of Sonoran Desert Scrub Community. The species in the area include blue palo verde (*Cercidium floridum*), foothill palo verde (*Cercidium microphyllum*), mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), catclaw acacia (*Acacia greggii*), crucifixion thorn (*Canotia holocantha*), creosote bush (*Larrea tridentate*), Ocotillo (*Fouquieria splendens*), saguaro (*Carnegiea gigantea*), buckhorn cholla (*Cylindropuntia acanthocarpa*), graythorn (*Ziziphus* spp.), hackberry (*Celtis* spp.), and prickly pear cactus (*Opuntia* spp.) (USFWS 2002).

Stands of cottonwoods, willows, and salt cedars in various sizes and densities are present along the lower reach of Tonto Creek, with a general increase in the abundance of native trees upstream. The riparian habitat along Tonto Creek includes Fremont cottonwood (*Populus fremontii*), Goodding willow (*Salix gooddingii*), seepwillow (*Baccharis salicifolia*), desert broom (*Baccharis sarothroides*), arrowweed (*Pluchea sericea*), and salt cedar (*Tamarisk* spp). The fragmented nature of these riparian habitats is due primarily to topography, watershed conditions, grazing, and human-induced factors (USFWS 2002).

Aquatic

Fish in Tonto Creek are typical of riverine habitats in central Arizona. These species are largely introduced and include rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomox nigromaculatus*), redear sunfish (*Lepomis microlophus*), green sunfish

(*Chaenobryttus cyanellus*), yellow bullhead (*Ictalurus natalis*), carp (*Cyprinus carpio*), bigmouth buffalo (*Ictiobus cyprinellus*), threadfin shad (*Dorosoma petenense*), channel catfish (*Ictalurus punctatus*), and flathead catfish (*Pilodictis olivaris*). Native fish recorded in Tonto Creek include Sonora sucker (*Catostomus insignis*), desert sucker (*Catostomus clarki*), longfin dace (*Agosia chrysogaster*), speckled dace (*Rhinichthys osculus*), razorback sucker (*Xyrauchen Texanus*), Gila chub (*Gila Intermedia*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and roundtail chub (*Gila robusta*) (AGFD 2004a; BOR 1996).

Wildlife

A diversity of mammals are present in the desert scrub and riparian vegetation within the Tonto Creek basin. Big game species such as mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), and javelina (*Tayassu tajacu*) are occasionally seen, although populations are greater in the adjacent uplands. Predators in the area include coyote (*Canis latrans*), bobcat (*Lynx rufus*), and gray fox (*Urocyon cinereoargenteus*). Other species include beaver (*Castor canadensis*), raccoon (*Procyon lotor*), Ringtail cats (*Bassariscus astutus*), Rabbits (*Lagomorpha*), Squirrels (*Sciuridae*), several Bat species (*Chiroptera*), Reptiles and Amphibians. Numerous birds are found in upland, riparian, and open water habitats including bald eagle (*Haliaeetus leucocephalus*) great blue heron (*Ardea herodias*), green-winged teal (*Anas crecca*), common flicker (*Colaptes auratus*), and red-tailed hawk (*Buteo jamaicensis*). Hunting for Gambel's quail (*Callipepla gambelii*) and dove (*Zenaida spp.*) is popular in the area (USFWS 2002; AGFD 2004b).

Threatened and Endangered

The U.S. Fish and Wildlife Service (USFWS) (Beatty 2004), stated that there are five federally listed threatened and endangered species and one candidate species recorded in the project area. These species are listed in Table 1.

Table 1. Threatened, endangered, and candidate species present in the Tonto Creek area.

Common Name	Scientific Name	Species Status
Loach minnow	<i>Tiaroga cobitis</i>	Threatened
Spikedace	<i>Meda fulgida</i>	Threatened
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate

The U.S. Fish and Wildlife Service is waiting on the completion of the appeals process before making a final decision on the persistence of Spikedace (*Meda flugida*) and Loach minnow (*Rhinichthys = (Tiaroga) cobitis*) critical habitat in Tonto Creek. The current critical habitat includes approximately 47 km (29 mi), extending from the confluence with Greenback Creek (just upstream of Roosevelt Lake) upstream to the confluence with Houston Creek (FR 2000).

The threatened, endangered, and candidate bird species; bald eagle, Yuma clapper rail, southwestern willow flycatcher, and yellow-billed cuckoo; are riparian obligate species and are found at the downstream end of the project area. These species use the Tonto Creek riparian corridor for breeding, nesting, foraging, and fledging their young. Records have shown bald eagles nesting in the Tonto Creek area since the 1950's. A bald eagle breeding area designated "Tonto" by the USFWS is located near the Tonto Creek inflow to Roosevelt Lake. This area is downstream from the A-cross road (FHA 1993). In 2002, a bald eagle nest at Tonto Creek fledged two young. A single clapper rail was confirmed at Roosevelt Lake in 2003 near the Orange Peel campground (approximately 3.75 km (2 ¼ miles) downstream). The southwestern willow flycatcher has nesting sites near the A-Cross and Bar-X Roads. In 2001, flycatchers identified at Tonto Creek just upstream of Roosevelt Lake represented about 8 percent of the entire state of Arizona population. Incidental sightings of cuckoos were reported during 1995 and 1996 at the Tonto Creek inflow to Roosevelt Lake. However, 1998 surveys at Tonto Creek did not locate any cuckoos, but two pairs were recorded in 1999 (USFWS 2002).

Other wildlife species of concern that could potentially be found near Tonto Creek basin between its confluence with Gun Creek and Roosevelt Lake were identified from Arizona Game and Fish Department's (AGFD) Heritage Data Management System. Species of concern include federally listed threatened or endangered species, Forest Service and Bureau of Land Management Sensitive Species, and AGFD listed species.

Plant species include the Tonto basin agave (*Agave delamateri*), Hohokam agave (*Agave murpheyi*), and Fish Creek rock daisy (*Perityle saxicola*). Each of these species has been found around Roosevelt Lake and Tonto Basin. The Tonto basin agave has approximately 70 plants that are known to be in Tonto Basin, the greatest concentration is near the northwest end of Roosevelt Lake. Ocotillo and saguaro are protected under the Arizona Native Plant Law as highly safeguarded species.

Other native fish species that have a potential to be impacted by the purposed bridge are the longfin dace (*Agosia chrysogaster*), desert sucker (*Catostomus clarki*), Sonora sucker (*Catostomus insignis*), roundtail chub (*Gila robusta*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and speckled dace (*Rhinichthys osculus*). The longfin dace, desert sucker, and Sonora sucker are common in Tonto Creek downstream of Gun Creek. The lowland leopard frog (*Rana yavapaiensis*) has been found at Roosevelt Lake, as well as numerous nearby drainages, as recently as 1995. However, it probably does not maintain breeding populations at Tonto Creek due to the presence of exotic predators. Lowland leopard frogs in these areas are probably transients from adjacent lands (USFWS 2002).

3.2 Cultural Resources

An extensive eight-year archaeological project was undertaken between 1989 and 1996 as part of the effort to identify impacts of modification to Theodore Roosevelt Dam and the realignment of State Route 188. The Roosevelt Rural Sites Study was conducted on behalf of the U.S. Bureau of Reclamation between 1991 and 1994. These studies, and continuing research in the Tonto Basin, indicate that the basin has been inhabited over the last several thousand years. Evidence of early occupations exists, but is rare due to flooding action overtime. The most common sites currently identified are those of the Hohokam and

Salado cultures from about 700 A.D. to 1400 A.D. The potential for discovery of archeological sites along the 14-mile reach of Tonto Creek that comprises the project area is high. This sensitivity includes areas adjacent to the creek and on associated terraces; particularly on stable pleistocene terraces that extend along the entire reach. Pedestrian surveys will be conducted in those areas proposed for crossing approaches, road re-alignments, and staging areas. Consultation with the State Historic Preservation Officer (SHPO) and relevant Native American tribes and groups, to determine the potential of encountering sites of religious or cultural significance with respect to the potential bridge setting, will be initiated and coordinated by professional archeologists working for the Corps of Engineers (COE). These activities will be conducted under authority of Section 106 of the National Historic Preservation Act, the American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Act of 1990, and Executive Order 13084 of May 14, 1999: Consultation and Coordination with Indian Tribal Governments.

3.3 Land Use

The project site is located within Gila County and the Tonto National Forest, immediately north or upstream of the Roosevelt Lake Recreation Area. Several small communities, are located within the study area along both the east and west banks of Tonto Creek. These communities are accessed from State Route 188, which is the major transportation corridor through Tonto Basin. The largest of the communities is Punkin Center, located on the west bank of Tonto Creek approximately 10 km north of Roosevelt Lake. On the east bank, near Punkin Center, is the Rancho Del Escondido Community. South (downstream) of these locations, along the west bank, are the communities of Roosevelt Lake Gardens West and Riverside Acres. Further south along the east bank of Tonto Creek are the two communities of Roosevelt Lake Gardens East and the North Bay Estates. Development on private lands within the Tonto Creek watershed is driven by demand for vacation homes, retirement homes, and a rural living experience. Commercial businesses near residential areas cater primarily to the tourist trade.

3.4 Socioeconomics

The primary demand for crossing Tonto Creek is by residents on the east side of Tonto Creek traveling to communities along the east side at the upper crossing, (Punkin Center Road), at the Roosevelt Lake Gardens East subdivision near the middle crossing, (Bar-X Road), and at North Bay Estates subdivision near the lower crossing, (A-Cross Road). Because spring flooding occurs each year, generally between March and April, Tonto Creek is generally impassable for 2 to 3 weeks at a time. Local residents recall up to 6 weeks of high water, prohibiting any crossing of Tonto Creek. The summer monsoon season brings flash floods in the summer months and early fall, which also result in extended closures. All these closures result in a lack of safe access and inconvenience for residents along the east side of Tonto Creek. In this manner, notably, residents are isolated from emergency response services such as police, fire, and ambulance. In serious medical cases, residents have been evacuated by helicopter. During periods of flooding, moreover, schoolchildren do not have access to local schools.

3.5 Recreation

Roosevelt Lake Recreation Area provides regional recreation opportunities, including boating, water sports, fishing, camping and sightseeing. Roosevelt Lake Recreation Area is

administered by the U.S. Forest Service as part of the Tonto National Forest. Unimproved dirt roads in the area are popular for off-road vehicle use.

3.6 Water Quality

The existing water quality of Tonto Creek is generally good. There are periods when water quality deteriorates to fair or poor conditions during periods of disturbance from Sand and Gravel Operations, and following large precipitation events. The reduction in water quality following precipitation events results from increased sediment delivered to Tonto Creek from the west side tributaries of Tonto Creek. Additional turbidity and reduced water quality also results from maintenance activities to the low-water crossings and the associated vehicular traffic.

3.7 Air Quality

The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act establishes two types of national air quality standards, primary standards and secondary standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Air quality is generally good in the Tonto Basin, and the area is in compliance with all NAAQS (BOR 1996).

3.8 Noise

The major noise source along Tonto Creek is Highway 188, which parallels the creek on the west bank. Areas east of the river are largely undeveloped and noise levels are typical of rural areas.

3.9 Aesthetics

Tonto Creek is located in the Tonto Basin, a broad alluvial valley that provides views of mountainous and desert terrain. Vegetation along portions of the creek includes salt cedar, cottonwoods, willows, and other riparian vegetation grow in abundance; while other areas are dominated by sparse desert vegetation. Dominant visual features surrounding Roosevelt include the Sierra Ancha Mountains and Mazatzal Mountains. Views of the Upper Sonoran Desert and its flora and fauna also are popular visual amenities.

4.0 Environmental Impacts

4.1 Biological Resources

Constructing a bridge at any of the alternatives would involve disturbing sediments through excavation, loss of vegetation, and changes to channel configuration. Increases in sediment load downstream of disturbed construction area are likely until the creek channels become stabilized. Pilot channels will contribute to sediment and higher flows that cross construction areas.

With these changes, there is a potential to increase riparian obligate species habitat at that site. However, unless the current low water crossings are closed/no longer used, the construction of a bridge in one location would not eliminate the repeated impacts to the Tonto Creek habitat. There would need to be strong support from the community to avoid the use of low water crossings.

The creek channel has been subject to repeated changes in bed elevation due to the repeated disturbance to maintain the existing low flow crossing. Bridge construction would cause a temporary loss of vegetation; however, with the reshaping and reestablishment of vegetation after construction, there is a potential to increase the quantity of riparian habitat.

Fish downstream of the proposed bridge may be subject to post-construction effects. Fresh concrete leaches salts, lime, catalysts, and potentially other materials that are toxic to fish for a period of up to nine months. The degree to which the concrete columns will leach toxic materials is unknown; however, such effects would be extreme at the bridge and dissipate downstream (Graves 2003).

In general, the two northern alternative bridge locations, Gun Creek and Kayler Crossings have little riparian habitat due to the narrow creek bed and steep banks. Saguaro and Ocotillo would need to be removed from the upland areas, especially at Gun Creek. There is less saguaro and ocotillo at Kalyer Crossing due to more disturbance. The habitat near the Punkin Center Crossing has been heavily disturbed and would not be substantially impacted by a bridge crossing.

The two southern crossings, Bar X and A-Cross, have some healthy riparian (southwestern willow flycatcher habitat) and functional aquatic habitat. The A-Cross site is located approximately 1 km (.62 miles) from the bald eagle breeding and yellow-billed cuckoo sighting and approximately 3.75 km (2 ¼ miles) to the Yuma clapper rail sighting. Construction at this site would also impact nesting habitat for the southwestern willow flycatcher. This would be covered in more detail in the biological opinion that will be prepared during the feasibility study.

Section 7 Endangered species consultation with USFWS will be done during the feasibility study. This consultation would take a hard look at the impacts to the federally listed threatened and endangered species and possible mitigation measures for the spikedace and loach minnows critical habitat impacts.

Without the bridge construction, the upland and riparian habitat within the three primitive low water crossings and channel modifications of Tonto Creek would continue to be impacted. Vegetation has been removed in these three areas to allow safe vehicle passage between the east and west side of Tonto creek. Vegetation loss reduces the habitat necessary for breeding, foraging, and roosting of riparian species. Habitat quality and quantity are reduced by increasing sedimentation rates, modifying the creek channel, potential increase of petroleum products in the stream, and increasing runoff caused by the use and maintenance of the low water creek crossings.

The increased sedimentation reduces substrate diversity necessary for foraging and breeding of native fish and other aquatic species. The use of heavy equipment and vehicles crossing the creek during times of low water impacts the survival of aquatic species by destroying eggs and impacting habitat. These impacts are continued each time the crossings are regraded, repaired, or recreated after a high water event.

4.2 Cultural Resources

For all the proposed bridge location alternatives a potential exists for adverse effects to National Register eligible historic properties, with the exception of the No Project Alternative. Avoidance is always the first choice of treatment for historic properties. Data recovery of historic properties is possible as mitigation, with the concurrence of SHPO.

4.3 Land Use

The proposed bridge will provide safe and reliable access for residents on the east bank of Tonto Creek for all alternatives, with the exception of the No Project Alternative. The bridge would not otherwise result in any significant impacts to land use.

4.4 Socioeconomics

The proposed bridge will provide access for emergency response services, including police, fire, and ambulance service, during periods of flooding. The bridge will also provide safe access for school buses. Under the No Project Alternative, residents of the east bank of Tonto Creek would continue to be isolated from these services during floods.

4.5 Recreation

The proposed bridge locations would not interfere with existing recreational opportunities. The No Project Alternative would not have any effect on recreation.

4.6 Water Quality

Construction of the proposed bridge could result in short term impacts to water quality from siltation and incidental discharge of construction materials or fuel from construction vehicles. As the project would involve dredging and filling within waters of the United States, the Corps would have to develop a Section 404 (b) evaluation in accordance with the Clean Water Act. The Corps or local sponsor would also be required to obtain a Section 401 permit from the Regional Water Quality Control Board. Implementation of appropriate construction Best Management Practices (BMPs) would likely serve to avoid any significant impacts.

Upon completion of the bridge, it would be possible to close the three existing low water crossings. Because existing siltation impacts related to the use and maintenance of these crossings would be alleviated, the bridge would result in a beneficial impact to water quality.

The No Project Alternative would not result in any short-term construction impacts. It would also not realize the beneficial long-term impacts of reducing siltation.

4.7 Air Quality

Construction of the bridge would result in short-term impacts to air quality, including vehicle emissions from construction equipment and worker trips, as well as dust from grading operations. No long-term air quality impacts would result from bridge construction. The No Project Alternative would not result in any air quality impacts.

4.8 Noise

Construction of the bridge would result in short-term noise impacts. In particular, pile-driving operations can result in noise levels in excess of 110 dbA. Those site alternatives located at greater distances from existing communities would have less noise-related impacts due to sound attenuation. However, it is likely that impacts would be less than significant for all alternatives due to their temporary nature. Noise levels during operation of the bridge would not be substantially different than existing conditions. The No Project Alternative would not result in any noise impacts.

4.9 Aesthetics

The proposed bridge would be elevated over Tonto Creek. It would be visible from a distance and may obstruct some views. Because the bridge would not obstruct a large portion of the viewshed, however, it would not result in a significant impact. The No Project Alternative would not result in any aesthetic impacts.

5.0 Applicable Federal Environmental Statutes

If a feasibility study is recommended, development and coordination of a NEPA document will be required to address all project environmental resources and issues. The subject environmental document will be prepared in accordance with the requirements of Section 102 of this Act and with the Council of Environmental Quality Regulations for implementing the Procedural Provisions of the NEPA.

Other environmental laws and regulations that will be complied with include, but are not limited to, the Clean Water Act, the Clean Air Act, the National Historic Preservation Act, the Wild and Scenic Rivers Act, the Fish and Wildlife Coordination Act, the Endangered Species Act, the Migratory Bird Treaty Act, Executive Order 11990 for the Protection of Wetlands, and Executive Order 11988 for Floodplain Management.

6.0 References

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Appendix B

Hydrology and Hydraulics Review (HDR Report for FEMA). In January 2004, HDR completed a Hydrologic Analyses for the Federal Emergency Management Agency-Region IX. The following is a summary of that review.

- 1) The appellations "Landing Creek" and "Lambing Creek" are interchanged in discussion and tabulation of tributaries to Tonto Creek.
- 2) The background work performed by Mr. Will Thomas is excellent and well documented, and the extension of that work to the study reach is clear and reasonable.
- 3) The empirical regression equations presented in Section 7.2 and used to compute 50-year and 100-year peak discharges for the identified tributaries are presented in an inconsistent form. In each case the variable "Area" has an *exponent* (-0.08, and -0.11, respectively). They are not clearly presented as such, although the calculations do reflect the proper equations.
- 4) The **Results**, Section 7.3, indicate *yields* greater than 1000 ft³/s for the small drainage areas (approximately 1 sq.mi.), which is a little high for upland areas in Arizona from my experience. The cluster of data for **Central Arizona Region 12** (Figures 40 and 41 of the reference cited) presents data and a 100-year peak discharge relation for low-to-middle elevation study areas. Perhaps this relationship might be more appropriate for elevations in the study area. The results (100-year peaks) do push the limit of observed maxima we (COE) have encountered in Arizona.
- 5) Finally, the Contractor for FEMA, HDR, contacted the Los Angeles District (LAD) concerning the "Section 7 Study for Modified Roosevelt Dam, Arizona (Theodore Roosevelt Dam), Hydrologic Evaluation of Water Control Plans, Salt River Project to Gila River at Gillespie Dam", prepared by LAD, and dated March 1996. At that time I informed the contractor that the Section 7 report did not contain any separable Tonto Creek information. For that specific study the Tonto Creek flow data was embedded in the inflow data to Roosevelt Dam. Since that time, with available funding from Planning Section C (LAD), I have been able to resurrect synthesized flow data generated for the Period-of-Record (POR) analysis of the Salt River Project (SRP) reservoir system effect on flows in the Salt River below Granite Reef Dam. Prior to the construction of Roosevelt Dam, flow data for the Salt River is available from August 1888 in a variety of forms. Since the closure of Roosevelt Dam flow data is available for Station 09499500, Tonto Creek near Roosevelt (Drainage Area = 813 sq.mi.) for the period from 1913 – 1940, also in a variety of forms. This latter data was "normalized" by the LAD to the Gun Creek location (Drainage Area = 675 sq.mi.) by a variety of techniques to fill in the data gap from the period after construction of Roosevelt Dam. Subsequently I used the HEC-FFA computer program to compare the systematic record with the combined systematic and synthetic record for Tonto Creek above Gun Creek because I felt the 100-year estimate was much higher than I had anticipated.

The results of the analysis of the 1941 - 2002 data set agreed with the results in Appendix A of the HDR report. Incorporation of the synthetic record indicates that not only is the January 1993 event the largest in the systematic record, but also the largest since 1913. Statistical analysis of that extended record indicates the 100-year peak discharge is approximately 90,000 ft³/s, nearly a 25% reduction from the results utilizing the systematic record alone. At this point I suggest the LAD consider the full implications of utilizing the higher FEMA discharges versus the results I just cited that include an artificially generated extension of the data set.

Appendix C

CESPD Milestone System

MIL¹	MILESTONE NAME	DESCRIPTION
100	Initiate Study Phase	SPD Milestone F1 ² - This is the date the district receives Federal feasibility phase study funds.
101	Study Pub Wkshp (F2)	SPD Milestone F2 – This is a Public Meeting /Workshop form the public and obtain input, public opinions and fulfill scoping requirements for NEPA purpose.
102	Feas Study Conf #1 (F3)	SPD Milestone F3 – The Feasibility Scoping Meeting is with HQUSACE to address potential changes in the PSP. It will establish without project conditions and screen preliminary plans.
145	Draft Feasibility Report	SPD Milestone F4 - Initiation of field level coordination of the draft report with concurrent submittal to HQUSACE through SPD for policy compliance review.
162	Final Public Meeting	SPD Milestone F5 - Date of the final public meeting.
165	Feasibility Report w\NEPA	SPD Milestone F6 - Date of submittal of final report package to CESPD-ET-P, including technical and legal certifications and compliance memorandum.
310	Filing of Final EIS/EA	Date that the notice appears in the Federal Register. Letters for filing would be furnished by HQUSACE.

¹ MIL – Milestone number used in the PROMIS database.

² F1 through F9 are the historical designations for the SPD Milestones.

Appendix D

LIST OF ACRONYMS

AFB	Alternative Formulation Briefing
ASA (CW)	Assistant Secretary of the Army for Civil Works
CESPD	South Pacific Division (also SPD)
DE	Division Engineer (Division Commander)
EA	Environmental Assessment
EC	Engineering Circular
EIS	Environmental Impact Statement
EP	Engineering Pamphlet
ER	Engineering Regulation
FCSA	Feasibility Cost Sharing Agreement
FONSI	Finding of No Significant Impact
FRC	Feasibility Review Conference
H&H	Hydrology and Hydraulics
HQUSACE	Headquarters, U.S. Army Corps of Engineers
HTRW	Hazardous, Toxic and Radioactive Waste
MSC	Major Subordinate Command
NAS	Network Analysis System
NED	National Economic Development
NEPA	National Environmental Policy Act
OBS	Organizational Breakdown Structure
P&G	Water Resources Council's Principles and Guidelines
PED	Pre-Construction Engineering and Design
PMP	Project Management Plan

Appendix D

LIST OF ACRONYMS

PPMD	Programs and Project Management Division
PROMIS	Project Management Information System
PSP	Project Study Plan
RAM	Responsibility Assignment Matrix
ROD	Record of Decision
S&A	Supervision and Administration
SPD	South Pacific Division (CESPD)
USF&WL	U.S. Fish and Wildlife Service
WBS	Work Breakdown Structure
WRDA	Water Resources Development Act

Appendix E Public Views and Comments

An overview of the major, questions, statements and concerns are captured in the bulleted list below: Q= question, A= answer, S= statement, R= response.

- Q: How feasible is this and how likely is this to actually happen? A: We are performing the study to provide a “snap-shot” for the Decision Makers.
- Q: Have Box Culverts ever been considered for the crossing? A: For this study it will not be considered, as it doesn’t meet the Congressional Intention of a functional and safe high-water crossing.
- Q: What is the time frame on this? A: The Request and Appropriation arrived in February 2004 and the Document is to be completed by September 30th, 2004.
- Q: How far are we from USFWS, USFS and AZ Game and Fish okay on this potential effort and does this provide the 404 permit? A: These Agencies and several others Agencies have been involved in the development from the initiation of the study, the above agencies don’t foresee any “Deal-Breakers” or “Show-Stoppers”.
- Q: Will any cost fall on the residents? A: I don’t know, in the past, we’ve been informed that a 10% cost share by the public was proposed and submitted to the Gila County Board of Supervisors, I don’t know what the result or outcome was.
- S: You said the Corps received the request and money in January/February 2004 and it’s May, I’d like to thank you, this has been talked about around here for about thirty-some years and you’ve told me more about this in the two-months you’ve been on it, then any of us have heard in the thirty-years its been talked about. R: Thank you for the complement Sir, we will hold a final public meeting near the end of September to present to the community a summary of the process and the findings of the evaluation, review and analyses.
- Q: What can the community do to encourage and support this study? A: The communities actions in participation tonight is one excellent way, the number of residents here tonight is an outstanding show of support, positive support and feedback to Local Elected Officials and Decision Makers.

The following is a summary of the responses on from the comment card provided at the final public meeting. There were 86 residents and 2 non-residents, a total of 88 individuals in attendance at the meeting 2 residents were children. Each individual was provided an executive summary, map and comments card, of the 86 distributed 50 were returned when the meeting adjourned.

Tonto Creek Special Study Questionnaire(Talley)

1.) Do you have a preferred location for the proposed bridge? $\frac{35}{\text{Yes}}$ or $\frac{14}{\text{No}}$

2.) Given the choice, which of the five locations do you prefer?
Gun (1); Kayler (2); Punkin/Sheep's (22); Bar-X (7); A-Cross/Redhill (3)

3.) Would you support Gila County or other Local efforts aimed at furthering this proposed bridge in one of the five location alternatives? $\frac{45}{\text{Yes}}$ or $\frac{5}{\text{No}}$

4.) Would you support financial measures and efforts to provide funding of some percentage of this proposed bridge project? $\frac{40}{\text{Yes}}$ or $\frac{10}{\text{No}}$

5.) Would you support the removal / rehabilitation of up to two of the low-water crossings upon completion of the a bridge? $\frac{31}{\text{Yes}}$ or $\frac{19}{\text{No}}$

6.) Would you continue to use the low-water crossings once a bridge was placed at any of the proposed location alternatives? $\frac{34}{\text{Yes}}$ or $\frac{16}{\text{No}}$

7.) Why would you choose to continue using the low-water crossings once a bridge was provided? Distance, Time, Convenience, Low Water Elevation at the crossing. A common statement on many, "It depends where the bridge is located.

8.) If a majority of the local community **would not** use the bridge as the primary means of crossing Tonto Creek, except during high water, do you feel the financial expenditure of the bridge is justified? $\frac{43}{\text{Yes}}$ or $\frac{7}{\text{No}}$

9.) Was the information presented this evening informative and useful to you?
 $\frac{42}{\text{Yes}}$ or $\frac{8}{\text{No Comment at all}}$

10.) There are 25 Elementary School children and other High School students who are not able to get to school,(5 comments) There are elderly and retirees who are not able to get to medical appointment or to pick up medication even if it were mailed and who cannot on a fixed income stock piles six-weeks of provisions, I'm not either and I've had these problems myself, (3 comments) Many times during these flood emergencies the weather will ground aircraft, the local fire department and other with equipment have risked there lives a lot to get folks across when the waters up, I believe what they've done has kept a couple residents from dieing, (3 comments). The bridge should be close to where the people live, near established roads, close to the most frequent destinations heavy use areas, (a summary of 6 comments). Please no more talk our community needs this bridge, (11 comments). Summer fires increase the runoff and we've had several, (3 comments). On 3/6/93, at about 0700, 63k acre ft past through the USGS gauge on Tonto Creek, (Retired Hydrologist, SRP).