Biological Assessment

Eastern New Mexico Rural Water System

August 23, 2010

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Eastern New Mexico
Rural Water System

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CHAPTER 1. INTRODUCTION

1.1. Background

The Eastern New Mexico Water Utility Authority (ENMWUA; previously the Eastern New Mexico Rural Water Authority [ENMRWA]) is proposing to construct the Eastern New Mexico Rural Water System (Project). If federal funds are appropriated, those funds would be used for project construction. Because federal funding through Reclamation is a discretionary federal action and subject to compliance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) is being prepared to evaluate the potential environmental consequences of the Proposed Action and other alternatives for constructing the Project.

The Proposed Action is funding the Project, which consists of construction of a pipeline and associated intake, storage, pumping, water treatment, and delivery facilities from Ute Reservoir to the eastern New Mexico municipalities of Clovis, Elida, Grady, Melrose, Portales, and Texico; Curry and Roosevelt counties; and Cannon Air Force Base (Participating Communities). The Project would deliver 16,450 acre-feet (AF) of water per year from Ute Reservoir to the Participating Communities to meet a portion of current and future water supply needs.

1.2. Purpose of this Document

The purpose of this Biological Assessment (BA) is to identify the effects of the Project on federal-listed threatened and endangered species potentially occurring within the Project Area. Section 7 of the Endangered Species Act (ESA) 1973, as amended, requires federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of proposed, threatened, or endangered species or result in the destruction or adverse modification of their critical habitats.

1.3. Description of the Project Area

The Project Area is located in east central New Mexico, roughly between Ute Reservoir and the town of Elida. The Project Area is located in Quay, Curry, and Roosevelt counties (Figure 1), and encompasses areas potentially affected by Project activities containing the proposed locations of the water conveyance pipelines and their corridors; the Canadian River, Revuelto Creek, and Ute Reservoir; and facilities including pump stations and water treatment plant sites. The zone of influence from the Project was considered for areas up to one mile (unless otherwise specified) on either side of the pipeline corridor, one mile from Project facilities (unless otherwise specified), Reservoir levels up to spillway elevation of Ute Reservoir and the ordinary high water mark (OHWM) of the Canadian River from Ute Dam to the New Mexico-Texas state line. The majority of the Project Area is located on private land, although a portion of the Project is located on State land (State Land Board and New Mexico Interstate Stream Commission ("NMISC")) in Quay County and military land in Curry County (see Figure 2 for land ownership in the vicinity of Ute Reservoir).

The project area covers two general geologic areas – exposed upper red-bed sediments that form the badlands north of the Llano Estacado escarpment (southwest of San Jon along the project area) and those on top of the Ogallala Caprock Caliche, south of the Llano Estacado escarpment generally forming the flatlands and playas in the southern portion of the project area.

The northern portion of the project area is dominated by the Upper Triassic Chinle Group, consisting of reddish sedimentary rocks, mostly sandstones and conglomerates, that extend from west Texas into eastern New Mexico (Hunt 2001). South of I-40, the project area crosses the Llano Estacado escarpment west of San Jon Village.

Figure 1. Project Vicinity.

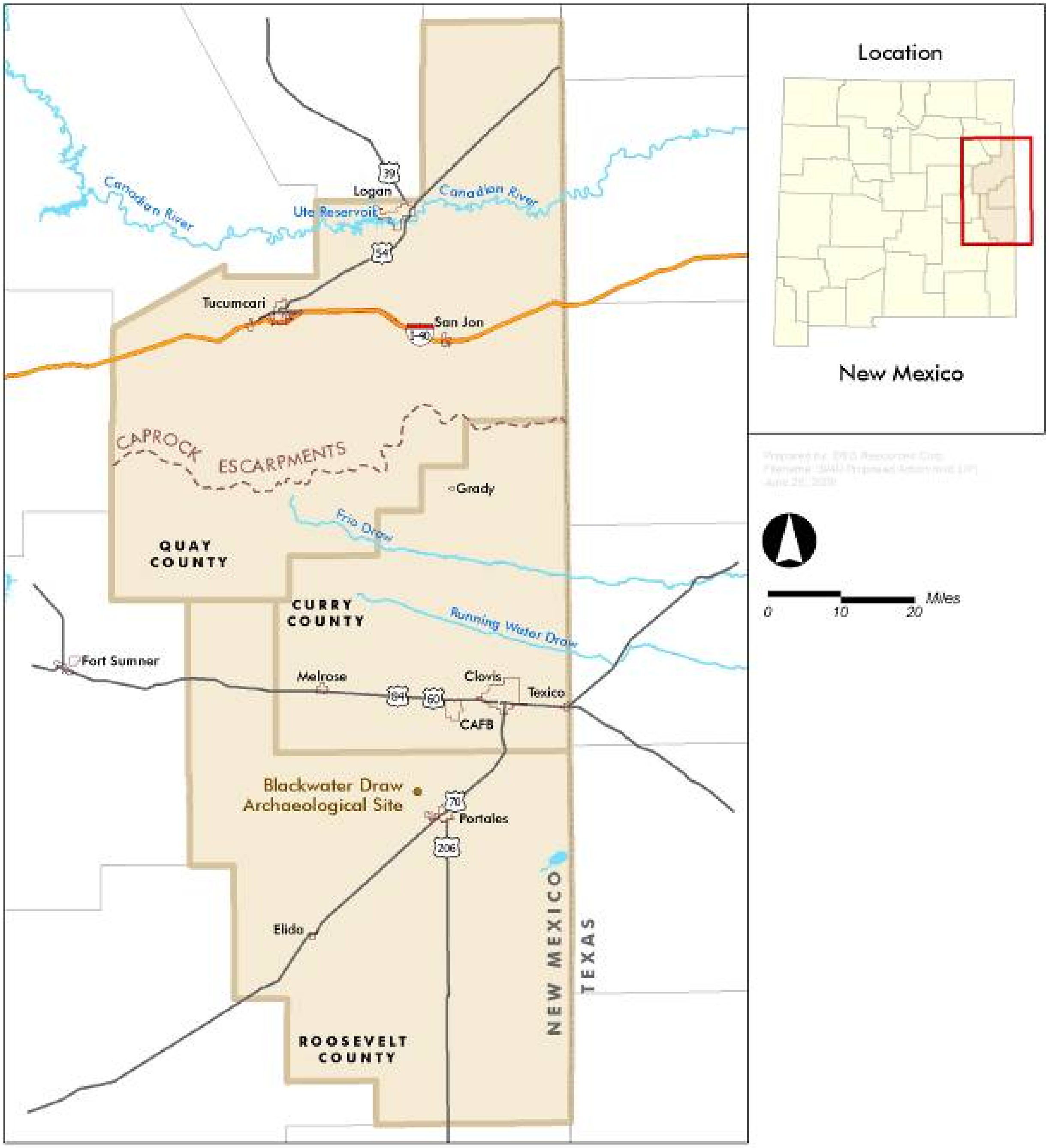
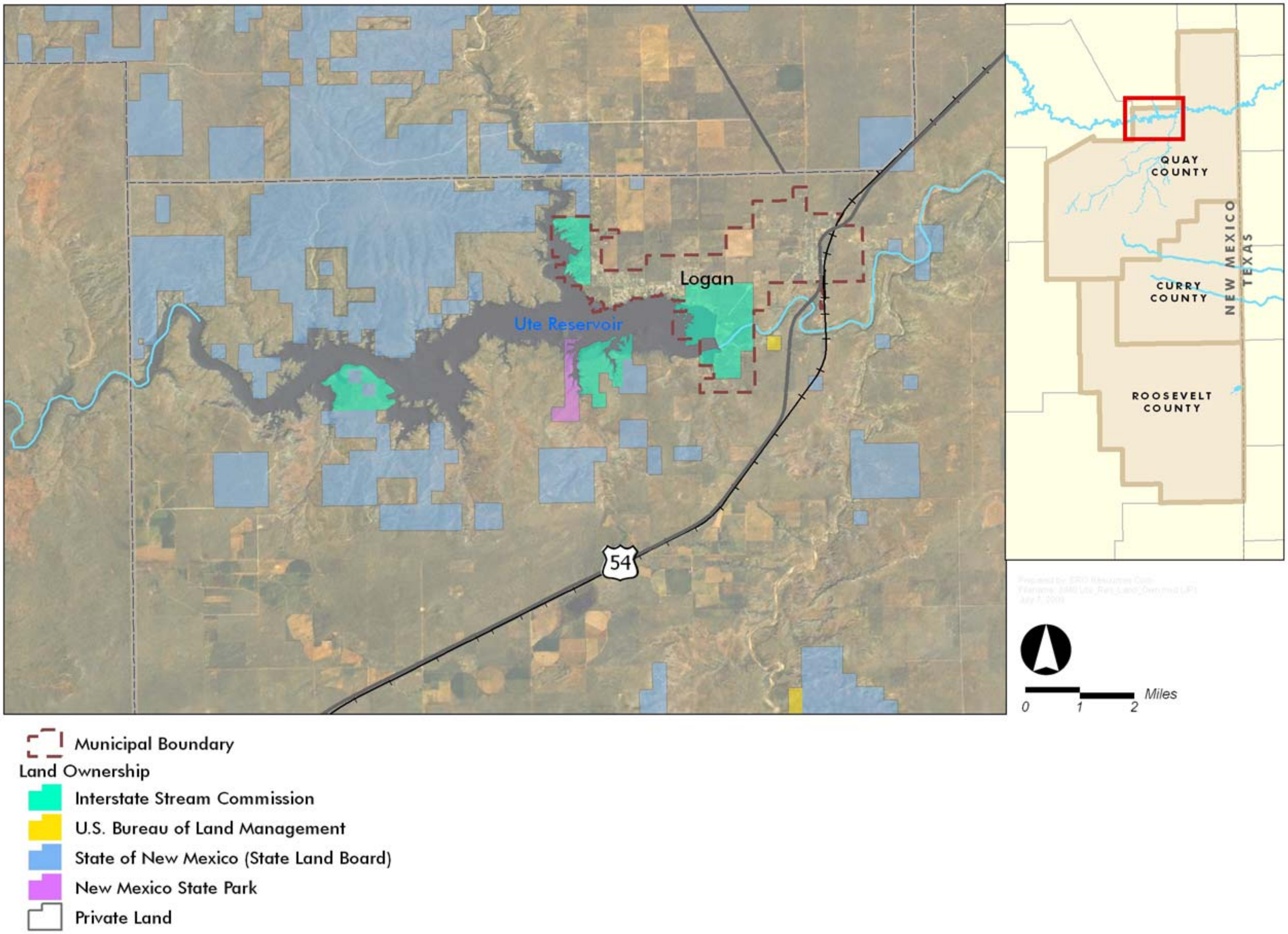


Figure 2. Land Ownership Near Ute Reservoir.



The Canadian River is a tributary to the Arkansas River and flows easterly over 750 miles through eastern New Mexico, Texas, Oklahoma and Arkansas. The river forms in remote southern Las Animas County, Colorado at an elevation of about 9,600 feet above sea level and drains about 17,600 square miles in New Mexico. The Canadian River watershed system encompasses a total of about 47,000 square miles across New Mexico, Texas, and Oklahoma before reaching the Arkansas River (EPA 2007). Much of the Canadian River watershed is captured by Conchas Reservoir 40 miles west of Ute Reservoir and the Arch Hurley Conservancy District. In eastern New Mexico, the river consists of a braided, meandering channel that is fed by numerous ephemeral, intermittent and perennial drainages and springs (EPA 2007). Within the Project Area, the river flows into Ute Reservoir. Ute Dam was completed in 1962, expanded in 1984, and constructed for water storage for industrial and municipal uses. Downstream of Ute Reservoir, the Canadian River flows through private ranching and agricultural lands before entering Texas.

Ute Creek, a tributary to the Canadian River and Ute Reservoir, provides most of the inflow for the Reservoir. The Ute Creek watershed begins about 150 miles northwest of Ute Reservoir.

1.4. Federal Facilities along the Canadian River and Ute Creek

Conchas Dam is the only federal facility along the Canadian River in New Mexico. Conchas Dam was built in 1938 by the U.S. Army Corps of Engineers (Corps) for flood control. The Tucumcari project, a Reclamation project in east-central New Mexico, surrounds the city of Tucumcari and encompasses about 41,000 acres of irrigable land. Tucumcari project features include the Conchas Dam and Reservoir, the Conchas and Hudson Canals, and a distribution and drainage system. The Tucumcari project is managed by the Arch Hurley Conservancy District.

There are no federal facilities on Ute Creek.

1.5. Consultation to Date

Data on federal-listed species that could occur within the Project Area were gathered from a database maintained by the Service (Service 2008). The Service completed a final Coordination Act Report (CAR) for the project June 15, 2010 (Service 2010). A meeting for this purpose was held in April 2007 with ENMWUA, Reclamation, NMISC, and the Service. Solicitation of Service input also was requested in writing in a letter from the Project team dated December 18, 2007 (ERO 2007). ERO Resources Corporation (ERO) and Reclamation discussed the Project with the Service in a phone conversation on January 25, 2008. The Project team requested a meeting with the Service to discuss consultation actions for the Project in February 2009. However, the Service stated that consultation could not begin until the Project had been authorized by Congress, which occurred on March 30, 2009. On April 22, 2009, Scott Verhines (ENMWUA) and Aleta Powers (ERO) met with the Service to discuss the Project. The CAR as well as Mitigation and Monitoring were discussed at a meeting on November 18, 2009 that included the Service, Scott Verhines, Mark Murphy (NMISC), and Aleta Powers. On May 12, 2010, Scott Verhines; Aleta Powers; Reclamation, including Bill Rohwer, Gary Dean, Marsha Carra, and Yvette Paroz; and NMISC, including Craig Roepke, Tracy Hartzler-Toon, and Jonathon Martinez; met with the Service to discuss the CAR and the USFWS EA comments.

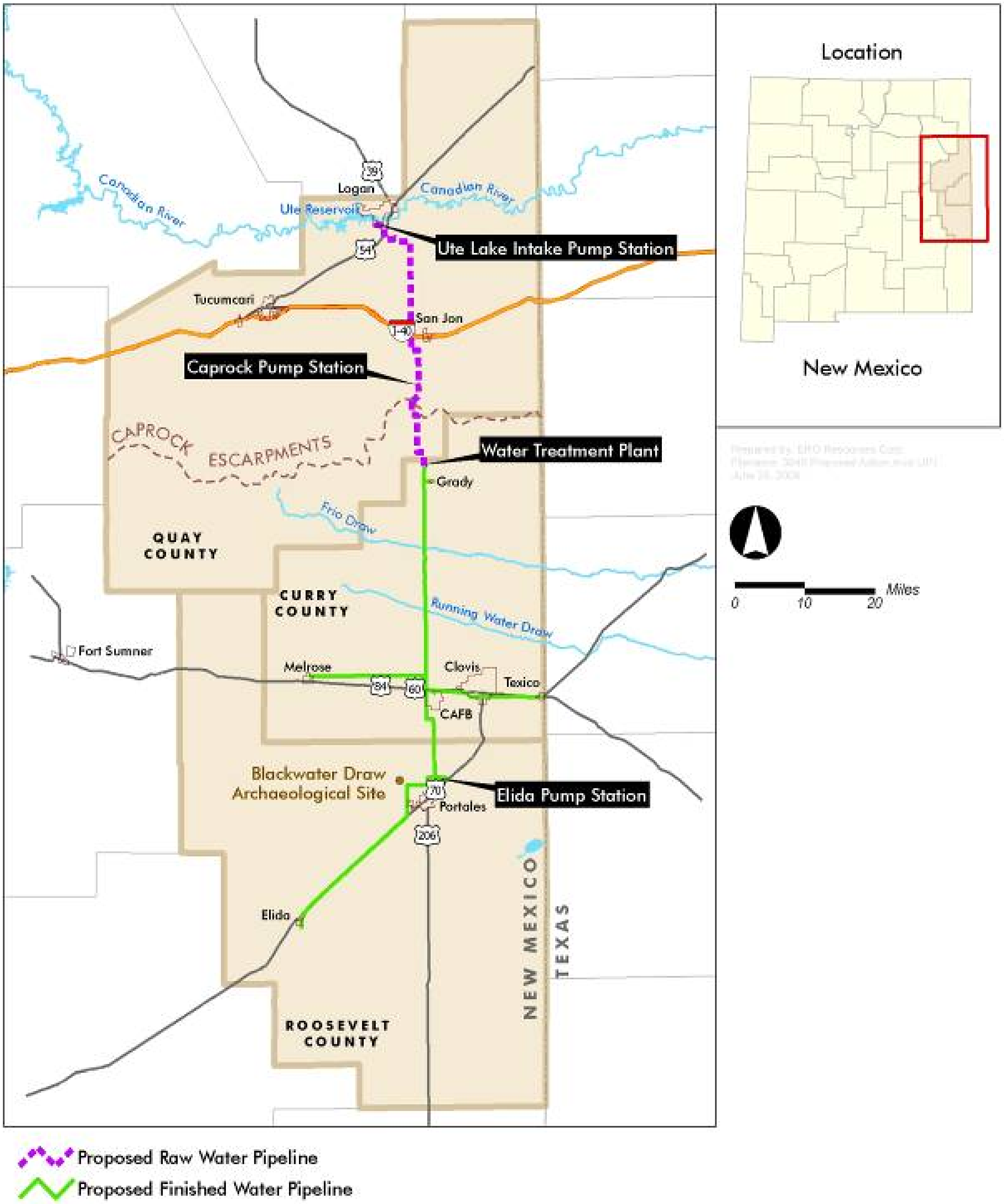
The Project team also has coordinated with the New Mexico Department of Game and Fish (NMDGF) regarding the lesser prairie chicken, a federal candidate species. Information from the state was also requested for the Arkansas River shiner because the state has responsibility for fisheries, including threatened aquatic species. ERO discussed the Project with the NMDGF in phone conversations in February and March of 2008. ERO met with the NMDGF in October 2008 to discuss the Project (NMDGF 2008a).

CHAPTER 2. THE PROPOSED ACTION

2.1. Introduction of the Proposed Action and Project

The Proposed Action is federal funding for the ENMRWS Project, which includes a peak-day 30 million gallons per day (mgd) delivery system from the Ute Reservoir to the Participating Communities. The major features of the Project are shown in Figure 3.

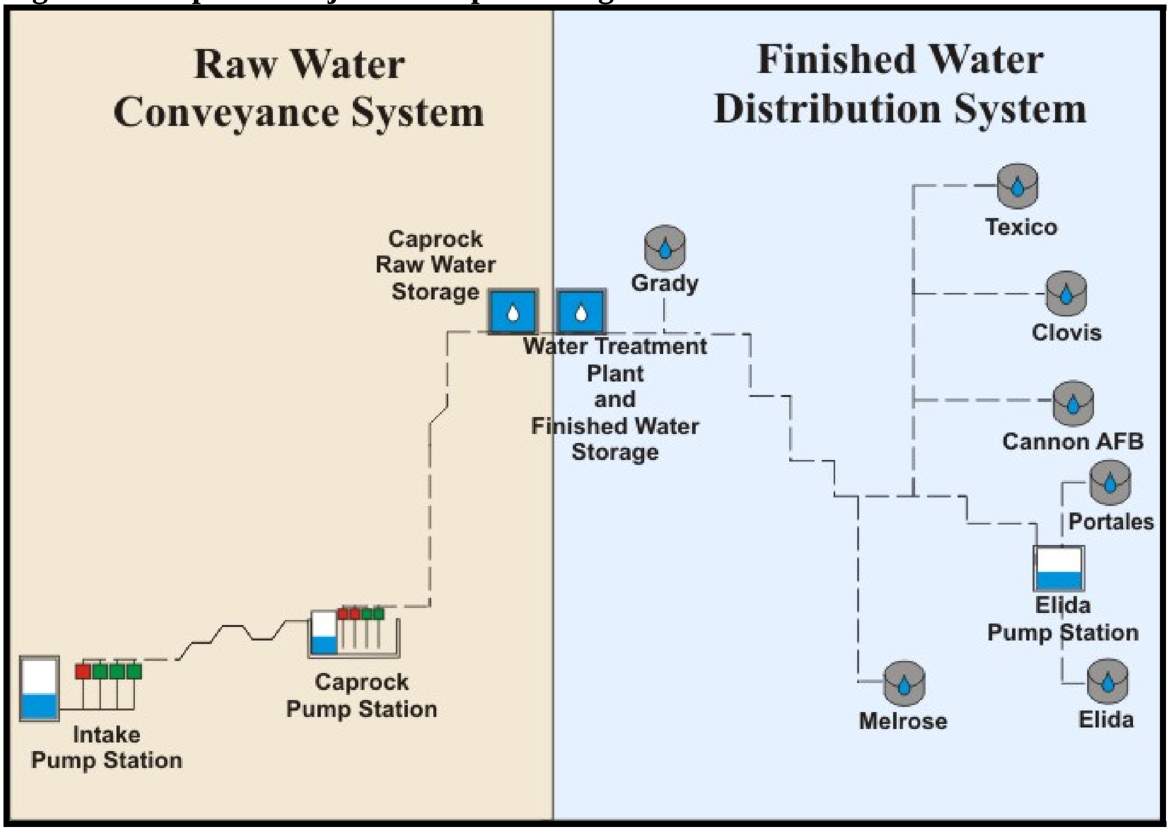
Figure 3. Proposed Action Location.



Design information for the Project was taken from engineering reports completed by CH2M Hill in 2006 and updated during subsequent design. The major system components are (also see Figure 3 and Figure 4):

- Raw water intake, conveyance, and storage
- Water treatment
- Finished water storage and conveyance

Figure 4. Proposed Project Conceptual Diagram.



Source: Adapted from CH2M Hill Technical Memo: Eastern New Mexico Rural Water System – Best Technical Alternative: Hydraulic Optimization and Raw and Finished Water Pipeline Process/Mechanical Preliminary Engineering (CH2M HILL 2006a)

2.2. Description of the Proposed Project

Ute Reservoir would act as the intake pump station forebay (see Figure 5). The Proposed Action would include raw water storage at two locations (Caprock pump station and the top of the Caprock) and finished water storage at the water treatment plant, with a 30-mgd peak-day capacity. The Participating Communities would use their existing finished water storage facilities for final storage. Pump stations would be located at the reservoir and at the base of the Caprock to convey raw water to the treatment plant (see

Figure 6). A small pump station would lift finished water to Elida. The type and size of conveyance piping would vary, with large diameter pipes for mainline conveyance (42- to 48-inch) down to 4- to 12-inch lateral lines for delivery to each Participating Community.

Figure 5. Location of Proposed Ute Reservoir Intake Pump Station.

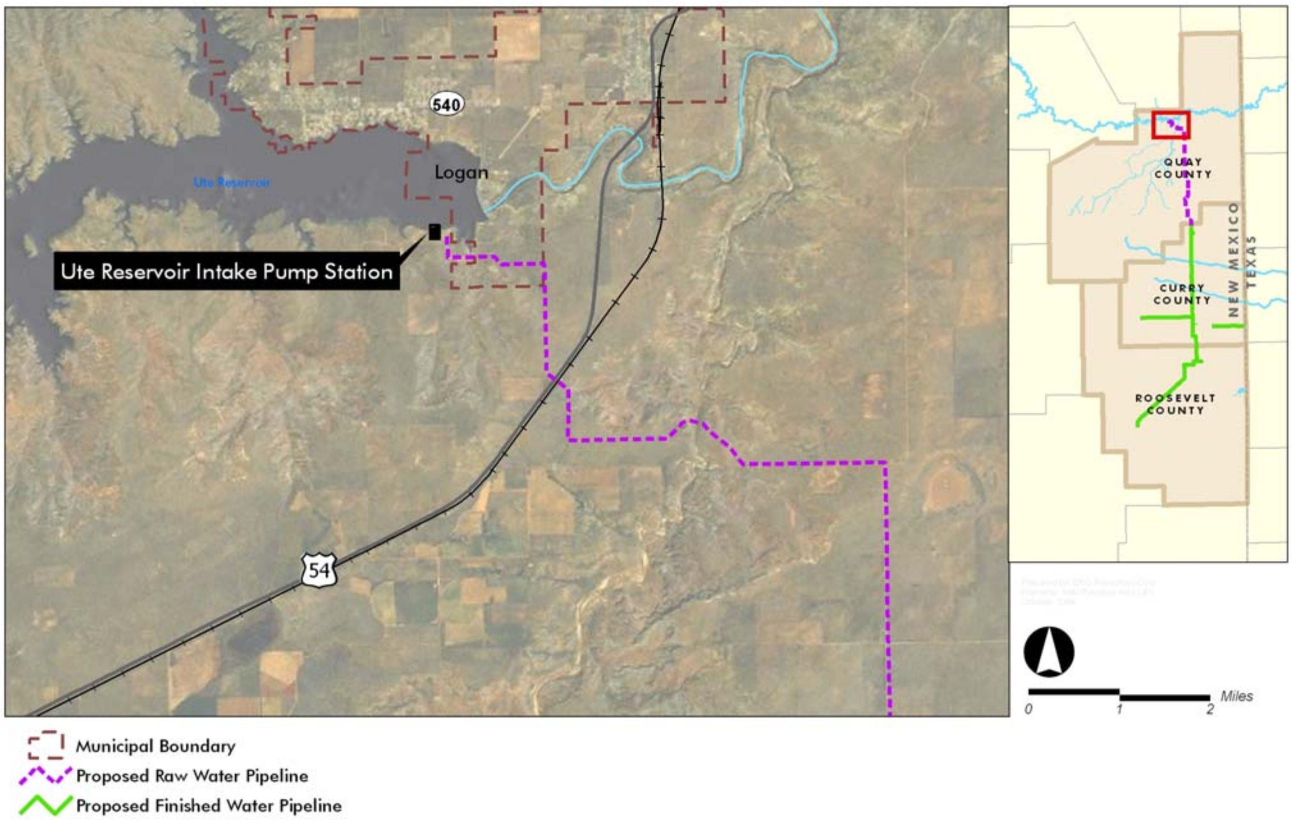
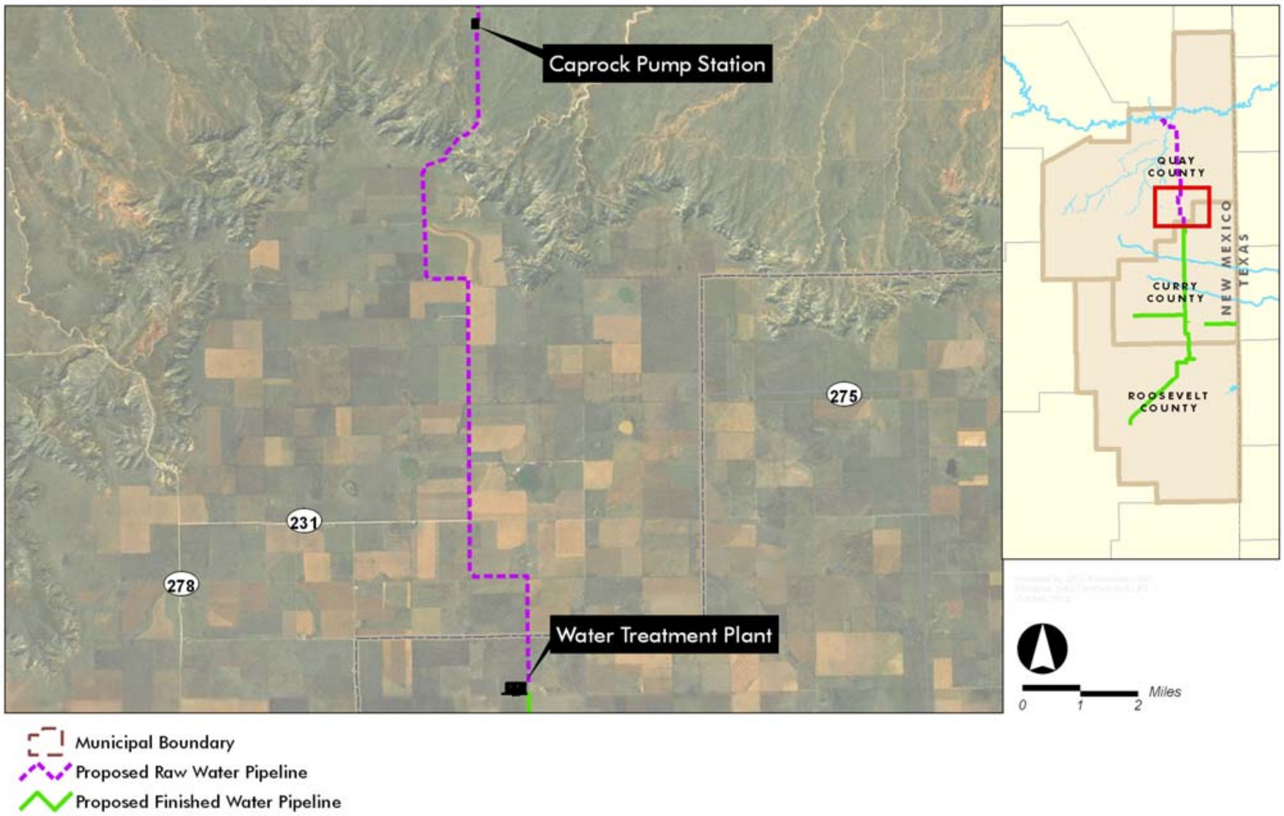


Figure 6. Location of Caprock Pump Station and Water Treatment Plant.

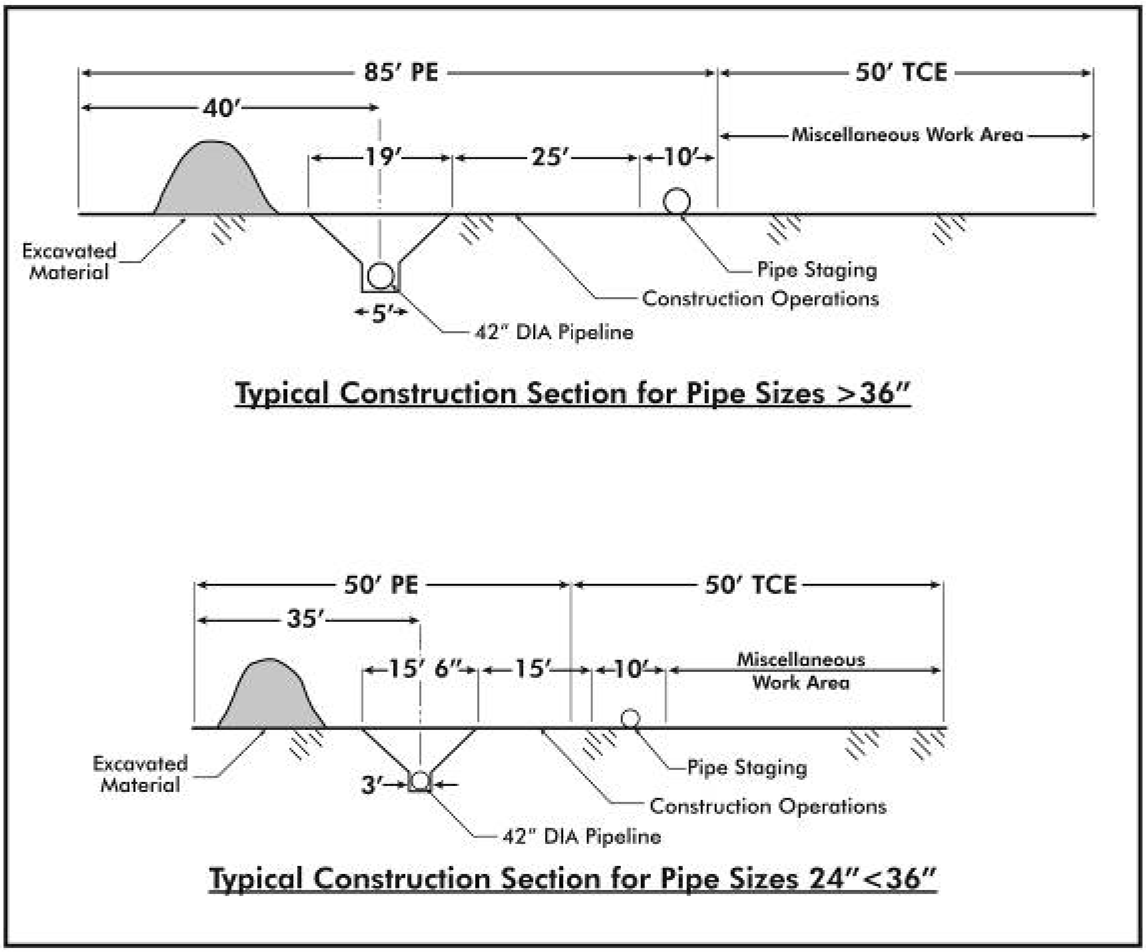


Major highways and railroad crossings would be accomplished by boring (auger boring or directional drilling). Creek crossings would be completed during low flow and would be open trenched, with the exception of Revuelto Creek which would be bored. For Revuelto Creek, the bore depth to the top of the protective steel casing would be about 30 feet. This depth protects the pipeline from potential scour. There would be bore pits located at the end of the pipe casing and pits would be located on either side of the crossing (see Appendix A for Revuelto Creek bore design). The boring activity at this location is anticipated to be less than 2 weeks in total duration, including construction of the bore pits.

Electrical infrastructure would require upgrades and additional service lines. About 10 miles of new or upgraded distribution lines would be required, and two substations would require upgrading (San Jon and Grady substations). One new substation may be required to serve the intake pump station. All electrical upgrades would be completed by Farmer's electric cooperative.

New permanent access roads would be required to access permanent facilities, including the intake facilities at Ute Reservoir, booster stations and water storage tanks, and the water treatment plant. Primary access roads would have a 24-foot paved surface and 5-foot gravel shoulders (total 34-foot width). Secondary access roads would have gravel surface with a total width of 15 ft. Temporary access roads would be required where the pipeline route does not adjoin existing roads. Temporary and permanent easements would be required for pipeline construction. For pipe diameters 36 inches or greater, an 85-foot permanent easement and 50-foot temporary easement would be needed (total of 135 ft). For pipe diameters less than 36 inches, 50-foot permanent and temporary easements would be required (total of 100 ft).

Figure 7. Typical Temporary and Permanent Construction Easements.



2.2.1. Raw Water Intake, Conveyance, and Storage

The intake pump station would be located along the south side of Ute Reservoir, approximately 2 miles west of U.S. Highway 54 along South Shore Drive (see Figure 5).

The intake structure would consist of an upper screened “Tee” at an elevation of 3,759 ft and a lower screened “Tee” at elevation 3,735 ft (below the level of the Conservation Pool at 3,741 ft. The screens on the “Tees” will keep fish and debris from entering the intake. The screen size (1/8 inch), intake velocity (< 0.5 fts), and approach velocity (0.21 fps) are sufficient to minimize any potential impacts to the fisheries of Ute Reservoir (NOAA 1995). The intake structure would be sized to accommodate withdrawals up to the maximum annual volume reserved by the UWC (24,000 afy); however, only 16,450 afy is part of the project and is therefore addressed in this BA. The maximum withdrawal for the ENMRWS is 16,450 afy.

The intake structure would divert water to a 48-inch diameter raw water pipeline, which would convey the water to the intake pump station (CH2M HILL 2006c). The intake pump station would pump the water to the booster pump station, which would be approximately 4 miles south of Interstate 40 along State Highway 39. The footprint of the intake structure and pump station would be about 3 acres. From the booster pump station, the raw water would be conveyed by 36- to 48-inch diameter raw water pipeline to a storage facility on the Caprock. About 41 miles of raw water pipeline would be installed.

2.2.2. Water Treatment

The water treatment plant (WTP) design and method is capable of meeting current and anticipated future drinking water quality regulations, and would have a treatment capacity of about 30 mgd. The WTP design was based on results obtained from treatability testing from Ute Reservoir water samples, known existing and potential future source water quality issues, and proposed finished water quality goals (CH2M Hill 2006b; also see Table 1). The WTP would be located near the northern-most Participating Community, Grady (see Figure 3 and Figure 6) and would require about 34 acres for the plant, access roads, and other components. The WTP would be a conventional coagulation plant with the following characteristics and components:

- Net production capacity of 28 mgd, with minimum plant flow of 5 mgd, and average treated water flow of 15 mgd;
- Two parallel rapid mix, flocculation, sedimentation, and ozonation process trains;
- Combined filtration through six parallel granular media filters;

- Disinfection using a chlorine/ammonia system;
- Solids setting and landfill disposal (about 3,000 cubic yards per year); and
- Finished water storage capacity of 10 mg.

Table 1. Water Treatment Plant Process, Benefits and Goals.

Unit Process	Process Benefit	Targeted Finished Water Quality Goal
Rapid mix	Destabilization of dissolved organic carbon (DOC) and turbidity	Turbidity; disinfection by-product precursors
Flocculation	Flocculation of destabilized particles into settleable floc	Turbidity; disinfection by-product precursors
Sedimentation	Settling of particles	Turbidity; pathogens; disinfection by-product precursors; manganese; iron
Ozonation	Provide disinfection, oxidize DOC, soluble iron and manganese, and taste and odor, and prepare water for biological filtration	Pathogens; taste and odor; disinfection by-product precursors; iron; manganese
Biological filtration	Removal of particles, DOC, taste and odor, and pathogens	Turbidity; pathogens; taste and odor; disinfection by-product precursors; iron; manganese; finished water biological stability
Finished water chemistry adjustment	Provide finished water stability	Finished water pH and alkalinity
Sodium hypochlorite and aqueous ammonia addition	Provide disinfection and chlorine residual removal	Pathogens; chlorine residual

Source: CH2M Hill 2006a.

2.2.3. Finished Water Conveyance and Storage

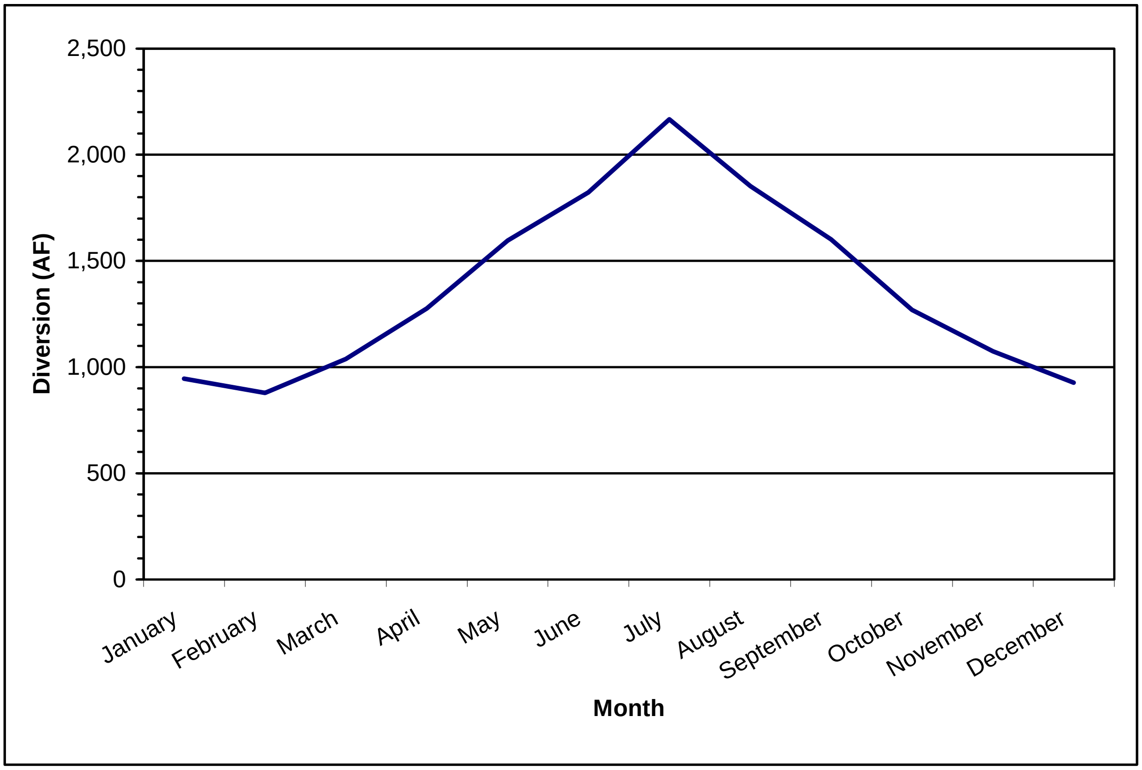
Most of the finished water system would be gravity feed, since the Participating Communities are lower in elevation than the water treatment plant. However, two booster pump stations (each with a footprint of about 2 to 4 acres) would be needed to deliver water to the Participating Communities. Each of the Participating Communities would use existing storage facilities. About 113 miles of finished water pipeline, including community laterals, would be installed.

2.2.4. Pumping and Operation

The annual maximum withdrawal from Ute Reservoir for the Proposed Project would be 16,450 AFY, which is equal to the total volume of water reserved by the Participating Communities. Maximum monthly withdrawals were developed by distributing the total annual withdrawal (16,450 AFY) based on historical monthly water use by Participating

Communities from 1993 to 1998 (Smith Engineering Company 2003). The maximum monthly withdrawal schedule for the Proposed Action is provided in Figure 8, and approximate allocation among the Participating Communities is shown in Table 2. Actual Ute Reservoir withdrawals may be lower than the demands shown depending on hydrologic conditions and actual demands from the Participating Communities.

Figure 8. Maximum Monthly Diversions under the Proposed Action.



Source: Smith Engineering Company 2003

Table 2. Participating Communities Water Use, Future Demand, and Water Reservation.

Participating Community	Current Water Use (AFY)	2060 Demand Estimate (AFY)[1]	Water Reservation (AFY)
City of Clovis	6,162	8,988	12,292[2]
Town of Elida	49	74	50
Village of Grady	21	27	75
Village of Melrose	141	203	250
City of Portales	4,217	4,523	3,333
City of Texico	171	293	250
Cannon AFB	1,121	1,706	-
Curry County	1,013	1,188	100
Roosevelt County	1,776	-	100

Participating Community	Current Water Use (AFY)	2060 Demand Estimate (AFY)[1]	Water Reservation (AFY)
Totals	14,671	17,002	16,450

[1]Demand estimates for Roosevelt County are incorporated into other entities.

[2]Includes Cannon Air Force Base.

Note: Some Participating Communities have reserved water in excess of their current and forecasted water needs, while some have reserved less. It is possible for the communities to reallocate or sublease their water allocation to balance community needs.

Source: CH2M HILL 2006b.

2.3. Summary of Legal and Statutory Authorities, Water Rights, and Contractual Obligations Relevant to the Action

2.3.1. Introduction

Legal and statutory authorities and obligations, water rights, and contractual obligations constrain the Project. This section of the BA elaborates on those authorities, responsibilities, and obligations.

The operations of the Project and water acquisition activities are proposed in accordance with: 1) the statutory Project authorizations and Reclamation law; 2) the purchase and appropriation of water rights under New Mexico territorial law and additional permits and applications under New Mexico state law; and 3) the beneficial use requirements under state and federal law.

2.3.2. Legal and Statutory Authorities

Federal-listed threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.). The ESA defines an endangered species as "a species in danger of becoming extinct throughout all or a large portion of its range" and a threatened species as "a species likely to become endangered in the foreseeable future" (ESA 50 CFR 17.3). Section 9 of the ESA prohibits "take" of any federal-listed species, except in limited and authorized circumstances (16 USC 1539). Take is defined as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture or collect wildlife being addressed. Potential effects to a federal-listed species or its habitat resulting from a project with a federal action require consultation with the Service under Section 7 of the ESA.

Candidate species are plants and animals for which there is sufficient information on their biological vulnerability to support federal listing as endangered or threatened (40 FR 38900; 1984), but listing is precluded by other higher priority listing activities. No regulations require consultation for effects to candidate species; however, if a candidate species becomes listed during project planning or construction, consultation with the Service would be required.

Migratory birds, including raptors, and any active nests are protected under the federal Migratory Bird Treaty Act (MBTA). While destruction of a nest by itself is not prohibited under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs is illegal and fully prosecutable under the MBTA (Service 2003). The regulatory definition of a take under the MBTA means to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect. In New Mexico, most birds except for European starling, house sparrow, rock dove (pigeon), and pheasant species are protected under the MBTA (16 U.S.C. §§ 703–712). Additionally, Executive Order 13186 directs federal agencies to take certain actions to implement the MBTA (66 Fed. Reg. 3853; 2001).

2.3.3. Water Rights

Allocations of water from the Canadian River watershed between New Mexico, Texas, and Oklahoma are specified in the Canadian River Compact as modified by Supreme Court Stipulated Judgment and Decree (Compact; see Appendix B). The water in Ute Reservoir is appropriated to the NMISC under a permit administered by the Office of the State Engineer (NMOSE). The Compact is a water allocation agreement that allows New Mexico to store certain waters originating in the drainage basin of the Canadian River below Conchas dam. According to the Compact, New Mexico must release all water in excess of 200,000 AF of total conservation storage in all reservoirs below Conchas Lake. NMISC operates Ute Reservoir assuming 6,760 AF of water is in storage capacity in reservoirs other than Ute Reservoir downstream of Conchas Lake. This leaves approximately 193,240 AF of allowable storage in Ute Reservoir before water must be spilled. In other words, the Compact limits the amount of water stored, not the amount of water used. The State has no minimum delivery obligations to downstream states under the Compact. Throughout the remainder of this document, the 193,240 AF storage limit is referred to as the “Compact maximum”.

2.3.4. Contracts and other Legal Obligations

2.3.4.1. Ute Reservoir Water Commission

In 1997, the Ute Reservoir Water Commission (URWC) entered a contract with the NMISC to maintain an option to purchase and to purchase water stored in the Ute Reservoir for beneficial consumptive uses, including municipal and industrial (M&I), sanitation, recreation and community irrigation uses. The URWC is a 12-member organization that includes the eight members of the ENMWUA. The NMISC sustainable yield analysis found that 24,000 AFY will be available for purchase by URWC (Whipple 1994). A portion of this water (16,450 AFY) is reserved by the URWC for members of the ENMWUA, and the remainder (7,550 AFY) is reserved by the URWC for Quay County entities (Quay County, City of Tucumcari, and Village of Logan). The URWC, on behalf of its members, may exercise its option to purchase any portion of the 24,000 AFY for the benefit of any of its members. Diversion plans and specifications must be approved by the NMISC, and diversions are subject to the terms and conditions of State Engineer Surface Permit No. 2900 and the 1997 Ute Reservoir Water Contract. The URWC is responsible for any water diversion and conveyance facilities, and for securing any easements necessary for those facilities. In addition, the URWC must measure any diverted water and provide documentation of water volumes to the NMISC.

Temporary facilities for withdrawal of URWC water for construction uses for a suburban residential and recreational community, along the south shore of Ute Reservoir, are in use. The URWC, on behalf of members Tucumcari and Quay County, have exercised their option to purchase approximately 800 AFY and entered short-term leases with the developer for use of this water.

2.3.4.2. "Minimum Fisheries Pool" MOA

In 1962, a Memorandum of Agreement (MOA) between the NMISC and the NMDGF established a minimum pool for fisheries at an elevation of 3,741.6 feet (2,350 acres) in Ute Reservoir. The purpose of the agreement was to provide a minimum water surface, storage, and environmental habitat, and this elevation provides a constraint on the reservoir operations.

2.3.4.3. Arkansas River Shiner Management Plan

In June 2005, the Canadian River Municipal Water Authority (CRMWA), in conjunction with the Service, Natural Resource Conservation Service (NRCS), Reclamation, NMISC, NMDGF, and several additional federal, state, and local agencies prepared the Arkansas River Shiner Management Plan (ARSMP) for the Canadian River from U.S. Highway 54 at Logan, New Mexico to Lake Meredith, Texas—a reach proposed as critical habitat in 2004. The ARSMP was not created in response to any other federal or state actions and was not created under Section 7 or Section 10 of the ESA, however the U.S. Fish and Wildlife Service (USFWS) is signatory to the Plan. The Plan is classified by USFWS under "Partnerships, conservation plans/easements, or other types of formalized relationship/agreement on private lands." The CRMWA and cooperative partners created the ARSMP to provide a flexible, adaptive, and proactive management approach towards achieving continued conservation of the shiner within eastern New Mexico and western Texas (CMRWA 2005). The goals of the ARSMP are:

- "Conserve and protect the existing healthy self-sustaining population of ARS;
- Maintain and existing ecological functions and processes that currently support the population of ARS. Maintain and improve habitat integrity. Provide a mechanism for monitoring the status of the ARS in these portions of its habitat;
- Encourage landowners and other involved parties to utilize good management practices on lands adjacent to the Canadian River to prevent damage to the riparian ecology. Minimize harm from the activities of off-road and all-terrain vehicles;
- A short-term intended purpose of this plan is to exclude the need to designate critical habitat in Unit 1A by identifying and enacting those conservation strategies listed in this plan;
- A long-range goal of this plan is to contribute to the eventual de-listing of the ARS upon re-establishment of the species in sufficient portions of its range, while maintaining a healthy population in the Canadian River from Ute Dam to Lake Meredith, and elsewhere as may be accomplished by other efforts."

Objectives of the ARSMP include:

- Manage and maintain existing base flows and seepage from Ute Dam;
- Control saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*);
- Control erosion in riparian zones; and
- Minimize impacts to shiner low flow habitat conditions from off-road vehicle groups.

The CRMWA Plan is referenced in the Final Rule for designation of critical habitat for the Arkansas River Shiner (FR 70:197, Rules and Regulations, Thursday October 15, 2005):

> "This 255 km (158.4 mi) long stream reach area was previously identified as Unit 1a and is excluded under the authority of section 4(b)(2) of the Act. The Canadian River Municipal Water Authority (CRMWA), in cooperation with at least 23 other Federal, State, and private partners, completed a special management plan for the Arkansas River shiner within this unit. After reviewing the plan, we believe that a reasonable certainty of execution and effectiveness exists such that conservation of the Arkansas River shiner would be promoted. Therefore we have concluded that the benefits of exclusion outweigh the benefits of designating critical habitat in this area…"

CHAPTER 3. LISTED SPECIES POTENTIALLY AFFECTED BY THE PROPOSED ACTION

3.1. Listed Species Found in the Project Area

Listed below by county are federal endangered, threatened, or candidate species and their status. Five federal-listed or candidates for federal listing potentially occur within the Project Area. There are no critical habitat designations for any of the five species listed in New Mexico; critical habitat has been designated for the shiner, but not within the state boundaries.

Table 3. Threatened, Endangered and Candidate Species within the Project Area.

			County		
Common Name	**Scientific Name**	**Status**	**Curry**	**Quay**	**Roosevelt**
Arkansas River shiner	*Notropis girardi*	Threatened		X	
Black-footed ferret	*Mustela nigripes*	Endangered	X	X	X
Interior least tern	*Sterna antillarum*	Endangered	X	X	X
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	Federal Candidate	X	X	X
Sand dune lizard	*Sceloporus arenicolus*	Federal Candidate			X

3.2. Species Not Affected by the Proposed Action

Table 4 includes federal-listed threatened, endangered, and candidate species that are not considered to be affected by the Proposed Action. The black-footed ferret is not likely to be affected by the Proposed Action because it is believed to be extirpated from New Mexico. In addition, no prairie dog colonies of sufficient size to provide suitable habitat occur in the project area. The sand dune lizard has not been recorded in the project area, and no suitable shinnery oak habitat occurs in or near the proposed Project; therefore this species would not be affected by the Project.

Table 4. Federal-listed Threatened, Endangered, and Candidate Species in Curry, Quay, and Roosevelt Counties not Considered to be Affected by the Proposed Action.

Common Name	Determination	Status[1]	Habitat	Rationale
Mammals				
Black-footed ferret	No Effect	E	Prairie dog colonies greater than 80[2] acres in size.	Not likely to occur – believed to be extirpated from New Mexico
Reptiles				
Sand dune lizard	No effect	C	Sandhills with shinnery oak component.	Offsite – not affected by Project

[1]E = Endangered; C = Candidate
[2]Survey required for black-tailed prairie dog colonies greater than 7,000 acres in size in New Mexico (Service 2009).
Source: Service 2008

3.3. Species Potentially Affected by the Proposed Action

Table 5 lists federal-listed threatened, endangered, and candidate species that may potentially be affected by the Proposed Action.

Table 5. Federal-listed Threatened, Endangered, and Candidate Species in Curry, Quay, and Roosevelt Counties Potentially Affected by the Proposed Action

Common Name	Determination	Status[1]	Habitat	Rationale
Birds				
Lesser prairie-chicken	May affect, not likely to adversely affect	C	Sandhills, shrublands	Known to occur within the Project Area
Interior least tern	No effect	E	Sandbars, shorelines near lakes and reservoirs	One documented transitory individual recorded in Project Area in 2004.
Fish				
Arkansas River shiner	May affect, not likely to adversely affect	T	Wide, shallow, turbid sandy stream bottoms	Known to occur downstream of the Project Area

[1]E = Endangered; T = Threatened; C = Candidate
Source: Service 2008

3.3.1. Lesser Prairie-Chicken

3.3.1.1. Species Background

The lesser prairie-chicken (LPC) is a resident grouse that occurs throughout the southern Great Plains. LPCs are typically found in rangelands dominated by shinnery oak-bluestem or sand sagebrush-bluestem communities (Massy 2001). They also use cropland that has been restored to grassland under the Conservation Reserve Program (CRP), particularly when mixed with forbs (Hagan and Giesen 2005). Additional habitat includes midgrass prairie rangelands and shrublands associated with sandy soils.

LPC feeding and foraging habits vary throughout the year. Adults and young forage in areas near nesting sites that are more open and contain forbs and shrubs. During the summer months, foraging areas include brood areas as well as fallow and planted fields. During the fall and winter months, foraging areas shift to grassier areas and grain fields. Foraging corresponds with a seasonal diet. During the spring, summer, and fall, young LPC tend to feed heavily on insects while adults feed on a mixture of insects, vegetative material, mast and seeds. During the winter diet consists almost entirely of vegetative material, mast, and seeds (Massey 2001).

Conversion of native grassland and shrubland habitat to agricultural land and ranchland has reduced populations of this species.

3.3.1.2. Distribution and Abundance

Historically, the LPC ranged throughout sandy habitat in the high plains of SE, Colorado, SW Kansas, western Oklahoma, parts of NW Texas, and eastern New Mexico (Hagan and Giesen 2005). Population density and distribution ranged considerably between the 1920's and 1980's, experiencing population declines and increases. Since about 1989, populations have been declining (Massey 2001). The LPC is now restricted to small, isolated populations across its historical range. Past reintroduction and transplant efforts have been unsuccessful (Hagan and Giesen 2005). Due to its decline and threats, the LPC is a candidate species for federal listing (66 FR 54817; October 30, 2001) and is listed by the state as a species of concern (NMDGF 2006).

All of Curry, Quay, and Roosevelt counties are mapped as overall range for the LPC. Preferred habitat for the lesser prairie-chicken has been mapped using Gap Analysis

Program (GAP) vegetation mapping located on the BISON and Southwest Regional GAP Analysis Project databases. According to GAP data, the greatest concentration of highest-quality LPC habitat is located in northern Quay County and eastern Roosevelt County, although several breeding areas or leks are known to occur in Curry County. The greatest concentration of known occupied habitat for this species occurs south of the Caprock between Wheatland and Clovis.

Numerous leks occur near the Project Area. No known leks are located within the proposed pipeline alignment or project facility footprints. The majority of the leks are located between the Caprock escarpment and the city of Clovis. There are also known leks near the town of Logan, north of Ute Reservoir. The nearest known leks to the Project Area are located about 0.25 to 0.5 mile from the proposed pipeline alignment about 4 miles south of Grady (NMDGF 2008a). Leks may occur on private lands near the proposed pipeline alignment, Caprock Pump Station and WTP. Lek locations on private lands cannot be disclosed by the NMDGF.

3.3.1.3. Reproduction

As with many grouse, LPCs form leks where females select mates, typically between late March and May (Hagan and Giesen 2005). During the mating season, males gather on lek sites and perform ritualistic displays to attract females. Displays occur from mid-March to mid-April and typically peak around sunrise and sunset (Massey 2001). Males are very territorial and will defend lek sites. Lek sites are often small (less than one acre), have little vegetation, and are often on knolls or ridges. Man-made disturbed areas such as roads and oil pads may be used for leks (Massey 2001). Nests are usually within two miles of leks, on the ground, in areas where shinnery oak or sand sagebrush grasslands have dense canopies and where there is a diversity of forbs and grasses. Nesting sites are typically in areas where vegetation exceeds 24 inches in height (Massey 2001). Nesting season is between mid-April and early July, and juveniles are independent by fall dispersal.

Young are typically raised in areas adjacent to the nest site that have more open ground for foraging. In the winter, LPCs are often found in areas with more cover, including riparian areas and small-grain agricultural fields.

In the Project Area, suitable LPC habitat occurs over about 4,000 acres of midgrass prairie and shrub steppe. Suitable nesting habitat in the project area is concurrent with suitable lekking habitat, and occurs within the northern portion of the Project Area between Wheatland and Clovis.

3.3.1.4. Critical Habitat

The lesser prairie-chicken is not federal-listed as threatened or endangered; therefore, there is no current or proposed critical habitat for this species.

3.3.2. Interior Least Tern

3.3.2.1. Species Background

The interior least tern (*Sterna antillarum*) is a migratory colonial bird that nests on tidal and riverine beaches and islands, as well as on sandbars and reservoir shorelines, creating a shallow "scrape" in sandy, unvegetated areas in which they lay their eggs. The interior least tern is one of three subspecies of least tern and ranges from Montana, south to eastern portions of New Mexico, and east to Louisiana (Doster 2006). Large open areas that contain 0 to 15 percent vegetation coverage are considered optimal nesting habitat for the species (Thompson et al. 1997).

Interior least terns are piscivorous and are associated with shallow water areas of rivers, streams and lakes. Generally, they feed close to their nesting areas and forage by hovering and diving for fish over standing or flowing water. They are believed to be opportunistic feeders, and feed mostly on small fish. Interior least terns generally forage in clear, relatively shallow waters 1- to 6-feet deep (Thompson et al. 1997).

The interior least tern is the smallest member of the tern subfamily, measuring about 8.7 to 9.5 inches in length with a 20-inch wingspan. Sexes are alike with a characteristic black-capped crown and white forehead. The back and dorsal wing surface are grayish, with white breast, belly and underwings. Legs are shades of orange or yellow and a black tipped bill whose color also varies. Immature interior least terns have darker plumage than adults, a dark bill, and dark eye stripe (Thompson et al. 1997).

3.3.2.2. Distribution and Abundance

The interior least tern was federal-listed as endangered June 25, 1985 (50 Fed. Reg. 21784). The interior least tern currently remains federal-listed in the states of Arkansas, Colorado, Illinois, Indiana (extirpated), Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Tennessee, and interior Texas (Service 1995). Interior least tern populations declined mainly due to habitat loss resulting from river channelization, dam construction, and regulated flows, as well as collection for the millinery trade (Service 1995). Terns are also sensitive to human disturbance and water management that results in flooding of nests. Large declines and continued threats to interior populations of the tern led to its listing as federal endangered in 1985 (50 Fed. Reg. 21784). In New Mexico, the tern is listed by the New Mexico Department of Game and Fish (NMDGF) as state endangered (NMDGF 1988).

New Mexico is located on the extreme southern and western periphery of the interior least tern's historic range. While most of the past research has centered in and around Roswell, New Mexico, other sightings have been documented near Las Cruces, New Mexico (1980), in the Rio Grande Basin, White Sands (1981), Holloman Lake near Alamogordo (1980/1982), Bottomless Lakes State Park, and Wade's Bog (prior to 1973). Additionally, the NMDGF considers the interior least tern to be a migrant along the Pecos River in Eddy County and it has occurred as a vagrant in Catron, Rio Arriba, San Juan, Doña Ana, Socorro (Bosque del Apache NWR), and Otero counties.

Curry and Quay counties are considered to be within the geographic range of interior least tern due to potential habitat along Ute Reservoir and the Canadian River (Service 2008a). Although no nesting has been recorded in the Project Area, an individual interior least tern was sighted at Ute Reservoir in 2004 (Reclamation 2009).

3.3.2.3. Reproduction

Interior least terns are migratory and breed along the Red, Missouri, Arkansas, Mississippi, Ohio and Rio Grande river systems. Interior least terns breed on sand bars in rivers and lake or pond edges free of vegetation.

The interior least tern nesting season is between late April and August throughout the species' range (Service 1995). Interior least terns spend about 4 to 5 months at their breeding sites, arriving from late April to early June. Courtship behavior occurs in the general vicinity of the nest site and involves fish presentations, nest scraping, copulation and a variety of vocalizations. Nests are a shallow and inconspicuous depression in an open sandy area, gravelly patch or exposed flat. Interior least terns generally nest in colonies; however, colonial nesting is not always the case at BLNWR with single pairs nesting up to 3.5 miles from the next closest nesting terns.

Interior least terns lay two to three eggs beginning in late May with incubation lasting approximately 20 to 25 days. Tern chicks are precocial and gradually wander away from the nesting territory as they mature. Fledging occurs at about 3 weeks with parental attention continuing until migration (Kingery 1998).

Interior least terns were first recorded breeding in 1949 in New Mexico at Bitter Lake National Wildlife Refuge (BLNWR), Chaves County (Doster 2006). They have bred annually at or in the vicinity of BLNWR since 1949. Numbers of breeding interior least terns at BLNWR have remained low and relatively constant. A small population of interior least terns has utilized this area for the past 51 years; the number of interior least terns sighted at BLNWR during peak abundance fluctuates annually, with 60 sighted on September 5, 1961 and no birds sighted for several years. Since 1989, there have been three to seven pairs nesting and as many as five chicks fledged in any given year. Interior least terns were known to summer in the vicinity of Dexter National Fish Hatchery in 1996 and two pairs were located north of BLNWR along the Pecos River in 1997.

On June 9, 2004, five pairs of interior least terns were observed in a backwater area of Brantley Lake in Eddy County, New Mexico (Doster 2006). The nearest documented nesting, to the Project Area, has been at BLNWR, 60 miles north of Brantley Lake, documented in the mid 1980s. These north-bound birds were likely migrating from Mexico to the BLNWR, but stopped short as suitable habitat (mud and sand substrate cleared of vegetation and near open water) was present at Brantley Lake. At least 14 adults were observed with an estimated seven nests on the lakeshore. Nesting individuals have been reported on the shores of Brantley Reservoir intermittently since 2004 (Reclamation 2008).

3.3.2.4. Critical Habitat

There is no designated critical habitat for the interior least tern.

3.3.3. Arkansas River Shiner

3.3.3.1. Species Background

The Arkansas River shiner (shiner) is a small cyprinid, generally less than 2 inches in length that has a rounded snout and a small subterminal mouth (Sublette et al. 1990). This species typically has eight rays on dorsal, anal, and pelvic fins and is usually tan in color with silver sides and a white belly (CRMWA 2005).

The shiner occupies the main channel habitat of wide, shallow, turbid, sand bottom streams in the Arkansas River basin (Gilbert 1980; Service 2005). Shiner adults are also usually found where there is a low velocity current and juveniles utilize more stagnant backwater habitats. Shiner adults may inhabit other low velocity habitats, including slow edge water habitats, backwater habitat, and pool habitat (Polivka 1999; Kehmeier et al. 2004). Bonner and Wilde (2000) note that between Logan, New Mexico and Lake Meredith, Texas, shiners were collected in areas along the Canadian River that were shallow, slow-moving waters that were relatively non-turbid. Other historical collections document large congregations on the downstream side of large transverse streambed ridges (Sublette et al. 1990).

Shiners tend to prefer habitat with sand as the primary substrate. The shiner also inhabits areas in which silt is the primary substrate, especially during the fall and spring (Bonner 2000). Between Ute Dam and Lake Meredith, the shiner has been collected in water temperatures ranging from 0.4°C to 34.7°C with pH readings between 8.2 and 8.5 (Bonner 2000).

The shiner is considered a generalist feeder (Wilde et al. 2001). The 1996 to 1998 study conducted by Wilde et al. found that 1,437 shiners, sampled within the Canadian River between Ute Dam and Lake Meredith, Texas, fed primarily on aquatic insects, plant material, detritus and sand/silt (2001). The shiner often feeds on invertebrates that are exposed by moving sand or are drifting in the current (Cross and Collins 1995; Wilde et al. 2001).

Aquatic insects (orders Megaloptera, Odonata, Plecoptera, and Trichoptera) and terrestrial insects (orders Coleoptera, Diptera, and Hymenoptera) comprise up to 20 percent of the diet of the shiner (Wilde et al 2001). Detritus and sand/silt comprise up to

50 percent of the diet of the shiner, except during the fall months. Climate conditions, such as drought and wet periods, greatly affect the diet of the shiner. During dry periods, the shiner appears more likely to feed on detritus, plant material and sand/silt because of the low abundance of invertebrates (Wilde et al. 2001).

3.3.3.2. Distribution and Abundance

The shiner was listed as federal threatened in 1998 (63 FR 64772, November 23, 1998). The shiner has undergone an 80 percent decline in occupancy of its historical range warranting listing. Causes for the decline, noted in the listing, include the modification of streamflows, inundation by impoundments, water diversions, and stream channelization. Other threats to the shiner include introduced non-native fish, including the Red River shiner (*Notropis bairdi*), other aquatic species such as introduced crayfish, and deteriorating water quality (Service 2005). In New Mexico, the shiner is listed as endangered by the state (NMDGF 2008b).

The shiner historically occurred throughout the Arkansas River drainage. The species formerly occurred from eastern New Mexico, through the Texas panhandle and across Oklahoma. The species was also found in southern Kansas in tributaries to the Canadian and North Canadian Rivers. The species was also known to occur in the Cimarron River in Oklahoma. In New Mexico, the shiner occurred throughout the Canadian and Conchas Rivers, as well as Ute and Revuelto Creeks in eastern New Mexico (SWCA 2004).

Currently, the species occupies about 20 percent of its former range. They are known to still occur within the Canadian River between Logan, New Mexico and the headwaters of Lake Meredith, Texas, and between Canadian, Texas and the upper end of Lake Eufaula in Oklahoma. Shiners also still exist in other streams and tributaries to the Arkansas River (CRMWA 2005).

In the Project Area, the shiner occurs in the Canadian River downstream from Ute Reservoir to the Texas state line. The Canadian River between Ute Reservoir in New Mexico and the New Mexico/Texas state line has historically supported a largely intact plains river fish community and contains one of the largest remaining viable aggregations of shiners (Service 2005). Figure 5 shows sites along the Canadian River and Revuelto Creek that have been sampled for shiner. Sampling methods were the same for 2003 and

2004. In 2005, sampling methods were modified in order to attempt to obtain population estimates using removal methods. Therefore, the total number of fish collected in 2005 is not directly comparable to previous sampling in terms of absolute numbers. In 2005, much larger areas were sampled resulting in higher numbers of fish collected, but a decrease in the catch per unit effort as the entire stream area in a 100m reach was sampled, compared to the subsampling of mesohabitats in 2003 and 2004. The percentage of the total catch, or relative abundance, is the metric used historically when comparing between years as seining was used in all years. The relative abundance and total number of shiners collected at sites shown in Figure 5 between 2003 and 2005 is shown in Table 6. There are other metrics, including catch per unit effort (CPUE), that have been used in the Canadian River basin and may be considered as shiner monitoring efforts continue.

Table 6. Relative Abundance as percent of total catch (%), total number of Arkansas River shiners (n) and catch per unit effort in number of Arkansas River Shiners per 100m^2 (CPUE) collected in the Canadian River and Revuelto Creek Between 2003 and 2005.

Sampling Site	Year		
	2003	2004	2005
C1	42.8 (n=157)	60.0 (117)	42.9 (779)
C2	9.8 (25)	22.8 (54)	23.9 (440)
C3	25.2 (112)	50.0 (130)	30.9 (562)
C4	12.7 (33)	36.3 (89)	26.5 (340)
Revuelto Creek	58.1 (233)	41.7 (139)	18.4 (14)

Source: SWCA 2004; SWCA 2006.

Additional unpublished data from field season 2006 is available for Revuelto Creek (American Southwest Ichthyologic Researchers, unpublished data). Revuelto Creek sites were sampled from near the same Revuelto Creek site sampled in 2003 through 2005 and a site approximately 7 miles upstream of the confluence with the Canadian River. The ARS was the third most numerous species found at this location behind red shiner and plains killifish. No sampling area was provided; therefore catch per unit effort could not be calculated.

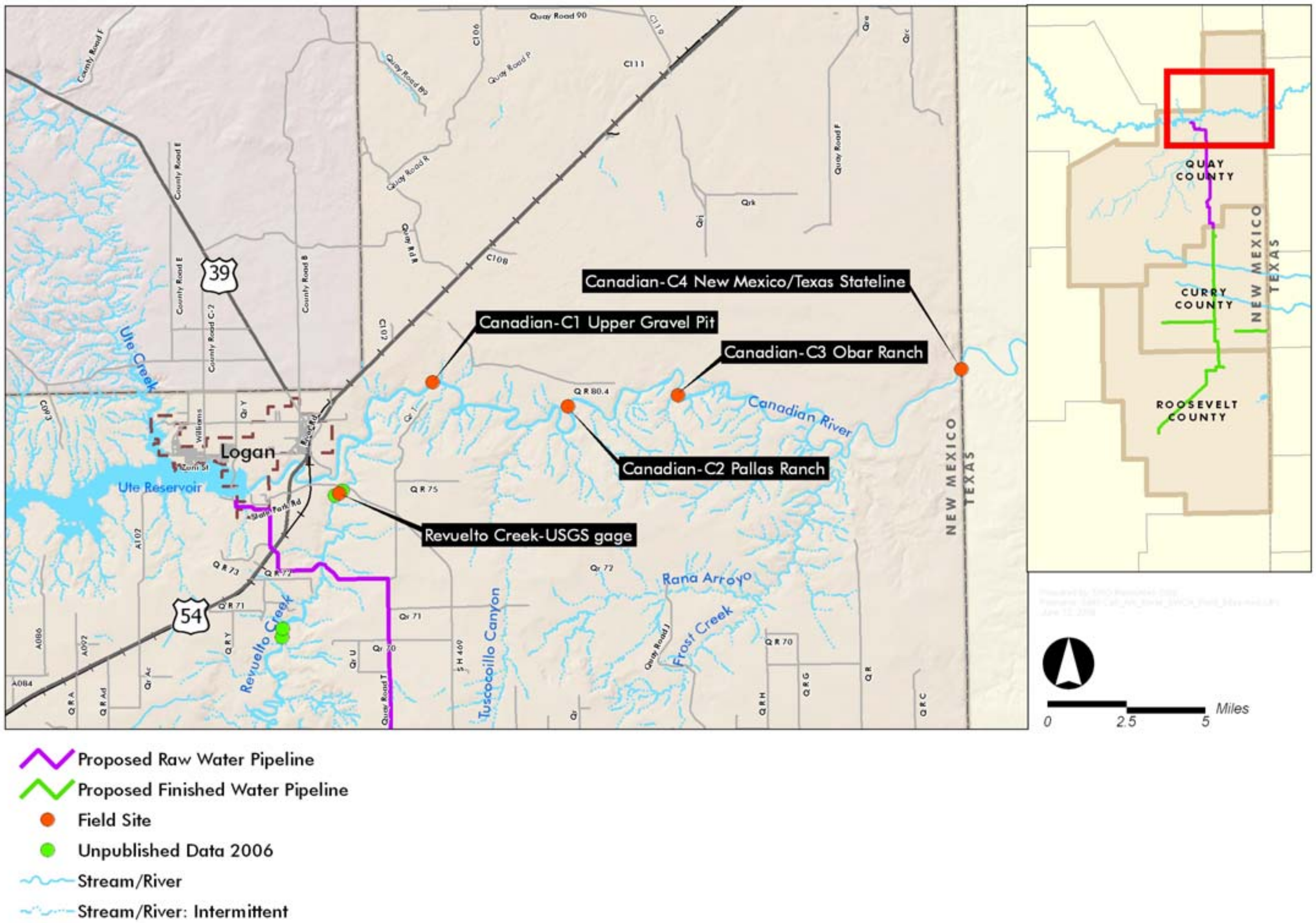
3.3.3.3. Reproduction

The shiner is a member of a guild of pelagic spawning fish that broadcasts gametes over an unprepared substrate. Spawning is apparently triggered by high flows that coincide with high precipitation events that occur primarily during the months of May, June, and July but may extend into August (Bonner 2000). There is also evidence for multiple asynchronous spawns in a single season (Wilde et al. 2000; Bonner 2000). While increased flows seem to increase spawning activities, some research suggest that spawning will occur during the spawning season as long as flowing water is present, independent of the magnitude of previous flow events, and that very high flow events may be detrimental to spawning success (Durham and Wilde 2006).

Bonner (2000) discussed the reproductive biology of the shiner in the Canadian River between Logan, New Mexico and Lake Meredith, Texas. Eggs are non-adhesive and semibouyant, requiring flow to stay in suspension in the water column and to remain viable (Platania and Altenbach 1998). Swift flow and high turbidity aid in dispersal (Bestgen et al. 1989) and protection from predators (Sublette et al. 1990). Fertilized eggs may be transported 45 to 89 miles before hatching. Eggs typically hatch within 24 to 48 hours of spawning.

During the first few days after hatching, fry drift downstream in post-spawning flows for at least 3 to 4 days before developing a swim bladder (Bonner 2000). After the swim bladder is fully developed, the protolarvae can begin to move horizontally, actively seeking low-velocity habitats along the shoreline or associated with structures creating velocity refuge in shallow areas (Platania and Altenbach, 1998). The timing of the spawn

Figure 9. Fish Sampling Sites along the Canadian River and Revuelto Creek.



with high flow events may have evolved to maximize retention of eggs and larvae in temporarily inundated vegetation and floodplain habitats (Bonner 2000; Wilde et al. 2001). It is likely that larval and juvenile fishes would take advantage of these warm and highly productive habitats to maximize their growth (Junk et al. 1989).

3.3.3.4. Critical Habitat

The New Mexico section of the Canadian River is part of what is considered the largest known remaining population of shiners. In 2005, the Service designated critical habitat for the shiner on the Canadian River downstream of the New Mexico/Texas border. The ARSMP precluded critical habitat designation (Service 2005). The ARSMP provides for the protection of state water resources in addition to species protection. The ARSMP was developed by the CRMWA to maintain and enhance shiner habitat integrity in the Canadian River between Ute Dam and Meredith Lake, Texas (Service 2005). Objectives of the ARSMP are:

- Manage and maintain existing base flows and seepage from Ute Dam;
- Control saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*);
- Control erosion in riparian zones; and
- Minimize impacts to shiner low flow habitat conditions from off-road vehicle groups.

Surveys conducted by NMISC found that the shiner population between Ute Dam and the state line composes a relatively high proportion of the total fish abundance in this reach. The population is self-sustaining under the current hydrologic regime (CRMWA 2005). NMISC is committed under the ARSMP to:

- Manage amount and timing of releases from Ute Dam, when required pursuant to the Canadian River Compact, to benefit to the spawning process of the AR shiner.
- Manage and maintain existing base flow of 3-5 cfs from Ute Dam, as measured at the Logan Gage on the South Canadian River, and incorporate that seepage into the ISC Strategic Water Reserve or otherwise manage the water.

CHAPTER 4. ENVIRONMENTAL BASELINE

4.1. Introduction

This chapter on the environmental baseline describes the impacts of past and ongoing human and natural factors leading to the present status of the species and its habitat within the action area (50 CFR §402.02). The environmental baseline provides, in effect, a “snapshot” of the relevant species’ health at present. This section includes past and present impacts of all federal, state, or private actions and other human activities in the Project Area, to the greatest extent possible. For purposes of this BA, the baseline includes state, local, and private actions affecting the species or habitat and actions that will occur contemporaneously with the consultation in progress. Future federal actions that have already undergone the consultation process are also included. The effects of the Proposed Action are compared against the environmental baseline.

4.2. Baseline Conditions of Lesser Prairie Chicken and its Habitat

4.2.1. Adult Lesser Prairie-Chicken Data

The NMDGF has been monitoring lesser prairie chickens in the area for several years. In east-central New Mexico, the NMDGF determined that there are about 4,291 square-miles of suitable LPC habitat (Massey 2001). Numerous leks are known to occur near the Project Area. The majority of the leks are located between the Caprock escarpment and the city of Clovis, although there are also known leks near the town of Logan, north of Ute Reservoir. The nearest known leks are located about 0.25 to 0.5 mile from the proposed finished water pipeline alignment north of Clovis and about 4 miles south of Grady (NMDGF 2008a).

4.2.2. Lesser Prairie-Chicken Habitat

Suitable foraging and habitat for the LPC exists in pockets throughout the Project Area. Within the Project Area, the highest quality habitat exists south of the Caprock escarpment between Grady and Clovis and in the sandhills south of Portales. Vegetation communities in these areas consist of about 4,000 acres of mixed-shrub steppe, sand sage, and mid-grass prairie. LPCs may forage on agricultural lands or other adjacent habitat types anywhere within the Project Area (NMDGF 2008a).

4.3. Baseline Conditions of the Interior Least Tern and its Habitat

4.3.1. Adult Interior Least Tern Data

No terns have ever been observed nesting at Ute Reservoir. An individual interior least tern was observed at Ute Reservoir in 2004, but appeared to be migrating through (Reclamation 2009). The nearest known nesting locations are at the BLNWR in Chaves County and at Brantley Lake in Eddy County (Reclamation 2009).

4.3.2. Interior Least Tern Habitat

At present no interior least terns are nesting at Ute Reservoir. The interior least tern has never been known to nest at Ute Reservoir. Potential nesting habitat (i.e., sandy areas with 0 to 15 percent vegetation above high water levels, in areas with little human disturbance) is limited at Ute Reservoir and nesting is not anticipated. The majority of the shoreline of Ute Reservoir is private and used frequently by private landowners (see Figure 2).

4.4. Baseline Conditions of the Arkansas River Shiner and its Habitat

4.4.1. Adult Shiner Data

A population of shiners exists downstream of Ute Reservoir in the Canadian River, and in Revuelto Creek (see Figure 9). As described in Section 3.3.3.2, four sampling sites yielded over 2,100 individuals in 2005 downstream of Ute Dam and in Revuelto Creek. There are no population monitoring sites on the Canadian River between Ute Dam and the Revuelto Creek confluence. Surveys conducted by NMISC found that the shiner population between Ute Dam and the state line composes a relatively high proportion of the total fish abundance in this reach. The population is self-sustaining under the current hydrologic regime (CRMWA 2005).

4.4.2. Shiner Habitat

Changes in hydrology in previous years have undoubtedly impacted shiner populations (CRMWA 2005). Since construction of Ute Dam in 1962, flows from Ute Reservoir have been managed. The constant flow provided by seepage from the dam, combined with the periodic flood flows from Revuelto Creek has been beneficial to the shiner (CRMWA 2005). The flows have supported the shallow, sandy-bottomed stream habitat preferred by this species. Flood flows from Revuelto Creek, entering approximately 7 miles downstream of Ute Dam, may trigger spawning in the reach of the

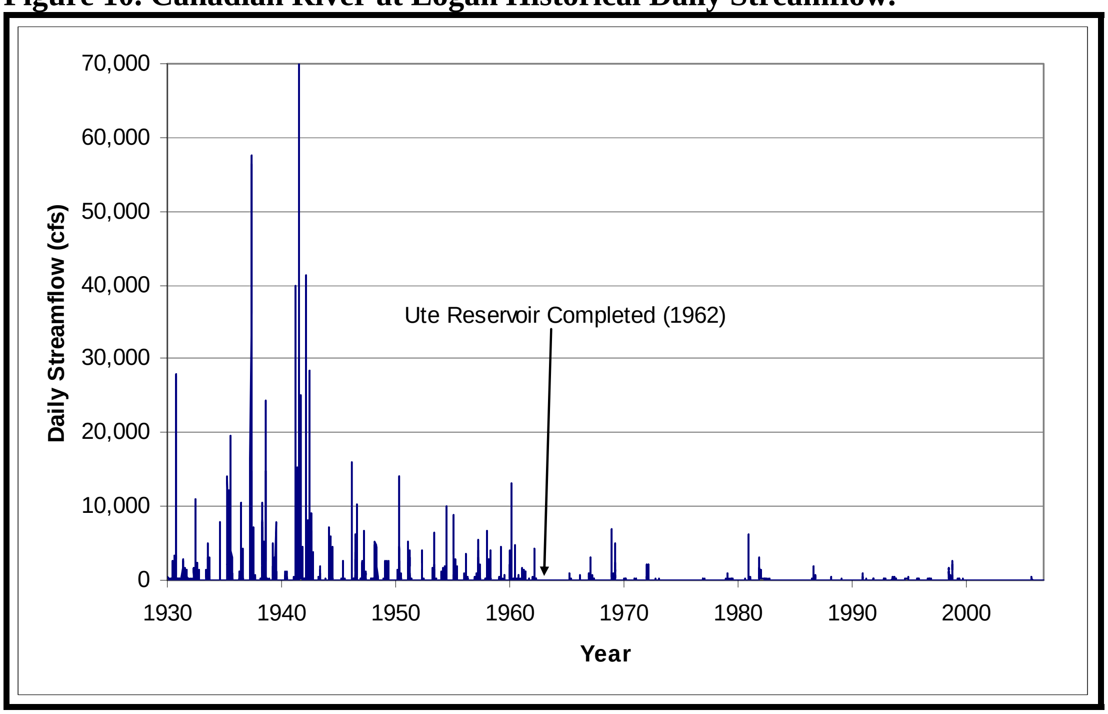
Canadian River downstream of Revuelto Creek. Revuelto Creek is unmanaged, and its drainage also supports an ARS population (at least 7 miles upstream of the confluence of Reveulto Creek and the Canadian River [American Southwest Ichthyologic Researchers unpublished data]. Construction of Ute Reservoir has also allowed for a more stable river channel which has allowed phreatophytic, weedy vegetation such as tamarisk and Russian olive to become established. Establishment of these species can cause depletions and water quality changes not beneficial for the shiner. The water use of species such as tamarisk and Russian olive can result in a higher salinity concentration within the Canadian River. Additionally, establishment of non-native phreatophytes may narrow and deepen streams and rivers, which is not favorable to shiner populations (CRMWA 2005). However, the unmanaged hydrology of Revuelto Creek is responsible for the majority of higher flow events in the Canadian River that may help maintain reproducing populations of the ARS in Revuelto Creek as well as the Canadian River downstream of the confluence with Revuelto Creek.

One goal of the ARSMP is control of tamarisk and Russian olive trees along sections of the river. Removal of these non-native species under the ARSMP can lead to shallower and braided streams with more opportunity for overbank flows, all features enhancing ARS habitat. There are two monitoring sites along the Canadian River in New Mexico; they are located 2.55 and 4 miles below the Ute Dam. Treatment has been completed approximately 4 miles up Revuelto Creek. Chemical treatment has proven to be the most effective and is generally applied in late August and early September. The treated areas are revisited once a year and timing for retreatment has not been established but is being completed on an as-needed basis. The percent kill is so successful that retreatment may not need to happen for 15 to 20 years (Goodwin 2009a). Treatment efforts have helped maintain shiner habitat by preventing the Canadian River and Revuelto Creek from becoming narrow and incised.

4.4.3. Hydrology

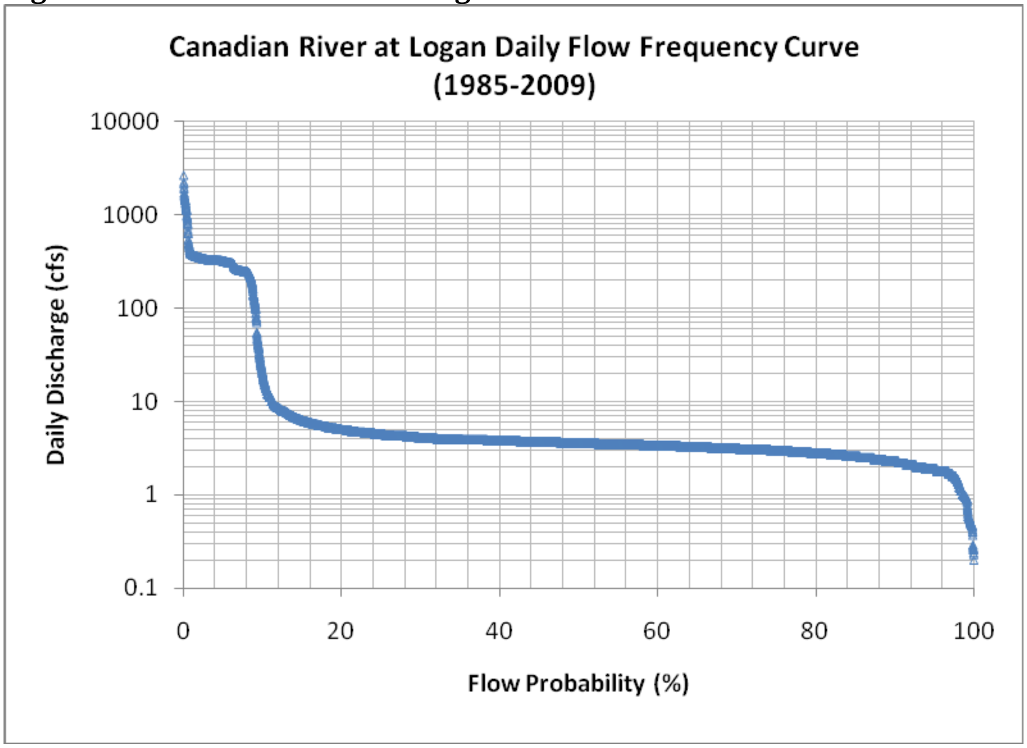
Historical streamflow in the Canadian River from Ute Reservoir to the New Mexico/Texas state line can be divided into two periods: prior to Ute Reservoir construction in 1962 and the period following the completion of the reservoir. The USGS streamgage, Canadian River at Logan, NM 07227000, located immediately downstream of the Ute Reservoir dam, is used to represent Canadian River streamflow downstream of Ute Dam for the surface water studies in this BA. A time series showing historical daily streamflow for the Canadian River for the 1930 to 2007 period of record (1909 to 1929 data are not plotted because of missing data) is provided in Figure 10. This shows that average daily streamflow varied from 0 to 70,000 cfs with a median daily flow of about 14 cfs before Ute Reservoir was constructed, and has ranged from 0.1 to 6,860 cfs with a median daily flow of about 3 cfs in the 1964 to 2007 period. Figure 11 shows the frequency of occurrence of daily streamflows from 1987 to 2009, the period after Ute Dam was raised. This is indicative of streamflows in the reach below the dam. Canadian River streamflow downstream of the reservoir and upstream of Revuelto Creek is primarily composed of seepage from or beneath Ute Dam as well as contributions from alluvial ground water and rainfall runoff, with occasional short-duration high flows originating from Ute Reservoir releases required by the Canadian River Compact or spills over the dam. Compact releases contribute to Canadian River streamflow on an unpredictable basis. The most recent releases for Compact compliance were in September 2006 and Spring of 2000. Compact releases are discharged from Ute Dam at 150 cfs to 350 cfs.

Figure 10. Canadian River at Logan Historical Daily Streamflow.



Source: MWH 2008.

Figure 11. Canadian River at Logan Flow Duration Curve



Canadian River streamflow increases downstream from Ute Dam to the New Mexico/Texas state line as a result of contributions from ground water, rainfall runoff, and surface tributaries. Revuelto Creek flows into the Canadian River about 7 miles downstream of the Ute Dam. Because it is unmanaged (i.e., is not dammed), Revuelto Creek contributes a wide range of flows. There is a USGS gage at Amarillo, and flow information from that gage was used to interpolate a median state line flow of about 101 cfs (MWH 2009b).

4.4.3.1. Revuelto Creek

Streamflow data were obtained for Revuelto Creek, the largest tributary to the Canadian River within the study area, at the Revuelto Creek near Logan, NM streamgage (gage #07227100). Revuelto Creek maintains a stable population of Arkansas River shiners. The drainage area for the Revuelto Creek streamgage is approximately 790 square miles, compared to the drainage area of about 10,000 square miles for the Canadian River at Logan. Based on streamflow information available beginning in 1962, the median daily discharge was 4.1 cfs, the maximum daily discharge was 9,400 cfs, and there was no flow about 10 percent of the time. A flow-duration curve is shown in Figure

12. The 100-year (1 percent) instantaneous peak discharge is about 30,000 cfs, and the 10-year (10 percent) peak discharge is about 16,000 cfs (MWH 2009b).

Table 7. Drainage Areas for Canadian River Locations.

Location	Contributing Drainage Area (mi^2)
Canadian River at Logan, NM (gage 07227000)	10,031*
Canadian River at NM/TX State Line**	12,580
Canadian River near Amarillo, TX (gage 07227500)	15,376***

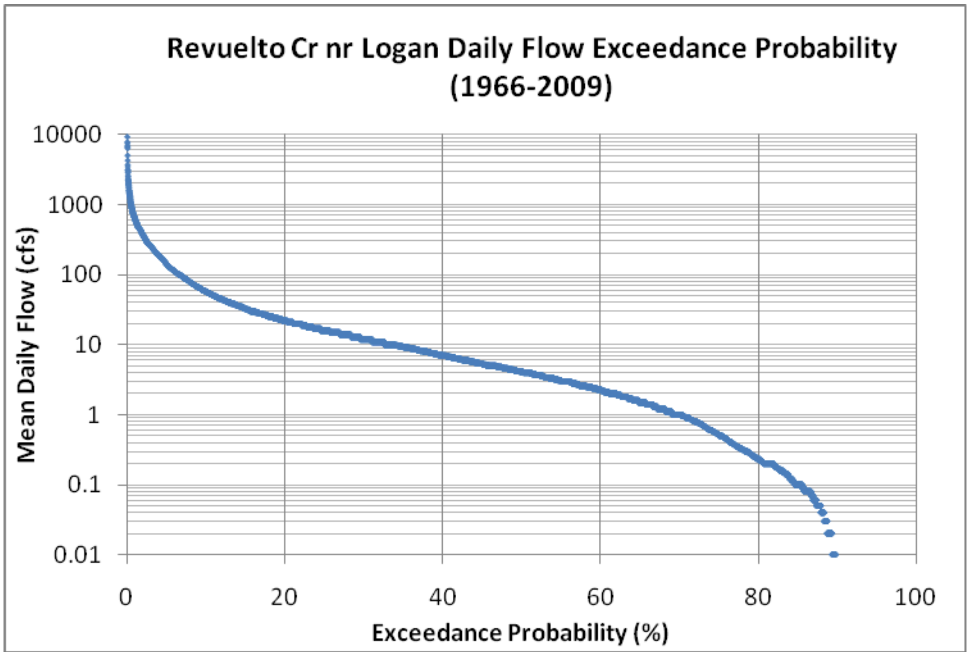
*Total drainage area = 11,141 square miles

**Drainage area at state line includes approximately 790 mi2 of Revuelto Creek drainage.

Source: MWH 2009b.

***Total drainage area = 19,445 square miles

Figure 12. Revuelto Creek near Logan Flow Duration Curve



4.4.3.2. Conchas Reservoir

Conchas Reservoir was constructed by the Corps in 1938. The reservoir was constructed for storage and flood control, irrigation storage and sediment storage (CRMWA 2005). Prior to construction of Conchas Reservoir, the shiner was known to occur in the Conchas River as far upstream as Sabinosa in San Miguel County (CRMWA 2005). Conchas Reservoir captures high mountain runoff that may have triggered Arkansas River shiner spawning in years prior to construction of this dam (CRMWA 2005) (MWH 2009a).

4.4.3.3. Ute Reservoir

Ute Reservoir is located about 42 miles east and downstream of Conchas Dam. Ute Reservoir was built in 1962 and the spillway was raised in 1984. The reservoir was built for water storage for municipal, industrial, and agricultural uses.

Flows and seepage out of Ute Reservoir have been stable since construction of the reservoir. Prior to construction of Ute Reservoir, the Canadian River below the dam was dry 20 percent of the time (CRMWA 2005). Following dam construction, there has been a relatively constant flow between 3 and 5 cfs. The consistent flows from Ute Reservoir, combined with occasional return flows from the Arch Hurley Irrigation District into Revuelto Creek, and flood events from the Revuelto Creek watershed, appear to provide adequate spawning habitat for the shiner.

Ute Reservoir has a maximum storage capacity of 245,000 AF. In 1993 the Supreme Court ruled that waters stored in Ute Reservoir, above the Compact Maximum must be released on the call of Texas (CRMWA 2005). Occasionally Compact releases from Ute Reservoir are made at discharges between 150 cfs to 350 cfs. An agreement between the NMISC and New Mexico Department of Game and Fish requires a minimum pool to be maintained at elevation 3,741.6 (about 28,700 AF); releases for water supply purposes would be curtailed at that elevation.

Under the *Arkansas River Shiner (Notropis girardi) Management Plan for the Canadian River from U.S. Highway 54 at Logan, New Mexico to Lake Meredith, Texas* (CRMWA 2005), flows in the Canadian River (3 to 5 cfs downstream of the Ute Dam) will remain consistent in order to maintain healthy populations of the shiner within this reach of the Canadian River.

4.5. Anticipated Impacts of all Proposed Federal Actions in the Action Area that have Already Undergone Early or Formal Section 7 Consultation

No past or proposed federal actions that required Section 7 consultation have occurred within the Project Area in recent years. Both Conchas and Ute Dams were completed prior to establishment of the ESA or NEPA.

4.5.1. Consultation History

4.5.1.1. Arkansas River Shiner Management Plan

In June 2005, the CRMWA, in conjunction with several federal, state, and local agencies prepared the ARSMP for the Canadian River from U.S. Highway 54 at Logan, New Mexico to Lake Meredith, Texas—a reach was proposed as critical habitat in 2004. The ARSMP was not created in response to any other federal or state actions and was not created under Section 7 or Section 10 of the ESA. The CRMWA and cooperative partners created the ARSMP to provide a flexible, adaptive, and proactive management approach towards achieving continued conservation of the shiner within eastern New Mexico and western Texas (CMRWA 2005). Goals of the ARSMP are to:

1. Conserve and protect the existing healthy, self-sustaining population of shiner.
2. Maintain the existing ecological functions and processes that currently support the population of shiner. Maintain and improve habitat integrity. Provide a mechanism for monitoring the status of the shiner in these portions of its habitat.
3. Encourage landowners and other involved parties to utilize good management practices on lands adjacent to the Canadian River to prevent damage to the riparian ecology. Minimize harm from the activities of off-road and all-terrain vehicles.
4. A short-term intended purpose of the ARSMP is to exclude the need to designate critical habitat in Unit 1A by identifying and enacting those conservation strategies in the ARSMP.
5. A long-range goal of the plan is to contribute to the eventual de-listing of the shiner upon re-establishment of the species in sufficient portions of its range, while maintaining a healthy population in the Canadian River from Ute Reservoir to Lake Meredith, and elsewhere as may be accomplished by other efforts.

CHAPTER 5. EFFECTS OF THE PROPOSED ACTION

5.1. Introduction

"Effects of the action" refers to the direct and indirect effects of a Proposed Action on listed species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action. The ENMWUA proposes to operate the Project to deliver water from Ute Reservoir to eastern New Mexico communities of Grady, Clovis, Melrose, Texico, Portales, and Elida. Water would be delivered via a pipeline with an annual maximum delivery of 16,450 AFY. The Proposed Action would result in no direct change in river flows, although some indirect changes in releases to meet Canadian River Compact obligations and from natural spills may alter river flows. These changes are summarized in the following sections.

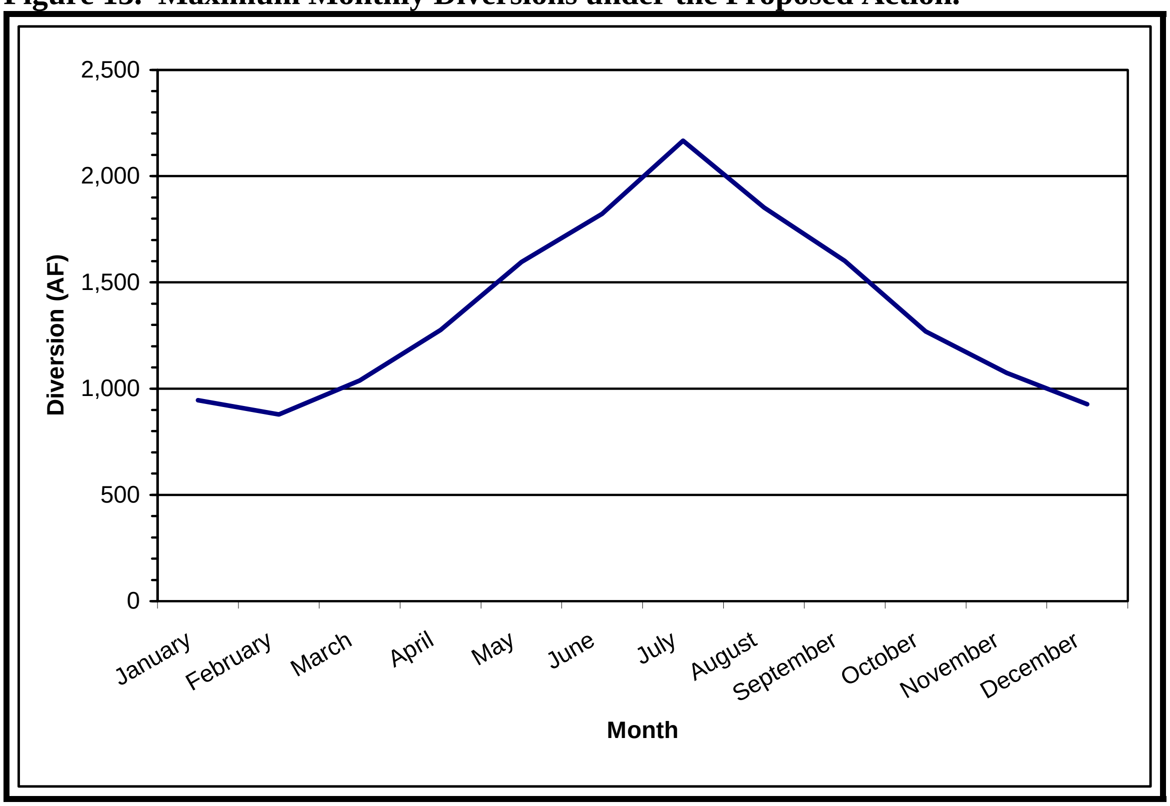
5.2. Hydrological Modeling for Comparing Alternatives

Modeling was completed to compare the potential effects of the Project and the No Action Alternative. An existing hydrology yield model originally constructed by ISC and updated by CH2M HILL for the ENMRWS Project EA ("CH2M HILL/ISC modified model") was used to model future conditions.

5.2.1. Ute Reservoir Demands – Hydrology and Operations

The model assumed that a total of 16,450 AFY, or the entire amount of water reserved by the Participating Communities would be withdrawn from Ute Reservoir. The anticipated monthly demand was based on existing seasonal demand patterns for the Participating Communities.

Figure 13. Maximum Monthly Diversions under the Proposed Action.



Source: Smith Engineering Company 2003

Storage contents in Ute Reservoir would be less under all but the wettest conditions for the Proposed Action when compared with the No Action Alternative. Effects on the mean simulated reservoir storage, stage, depth, and surface area are summarized in Table 8. Reservoir storage, stage, and surface area are all lower for the Proposed Action when compared with the No Action Alternative because of the proposed ENMRWS diversions from Ute Reservoir under the Proposed Action.

Table 8. Simulated Ute Reservoir Storage Properties.

	No Action Alternative			Proposed Action		
	Min	**Ave**	**Max**	**Min**	**Ave**	**Max**
Storage (AF)	122,040	174,350	245,000	50,140	146,130	245,000
Stage (ft)	3,772	3,781	3,790	3,751	3,775	3,790
Area (ac)	4,923	6,289	7,691	2,499	5,508	7,691
Releases/spills (AF/yr)	0	23,910	210,610	0	12,860	148,170

Source: MWH 2009b

5.3. Water Delivery

Water delivery from the Project is projected to reduce the number of Canadian River Compact releases. Releases are made from Ute Reservoir when reservoir storage exceeds the Compact maximum. Water delivery for the Project could reduce the frequency and magnitude of naturally-occurring spills and releases required to comply with the Canadian River Compact. The following section, tables, and graphs detail the changes to releases/spills. All results were modeled using the CH2M HILL/ISC modified model, and information was extracted from the *Hydrology Effects Analysis Report* (MWH 2009b).

Simulated releases from Ute Reservoir for the No Action Alternative and Proposed Action are summarized in Table 11. Releases include those made through the outlet works (operational capacity of 325 cfs) to meet the maximum storage requirements of the Canadian River Compact, spills through the reservoir spillway, and any additional releases to maintain 3 to 5 cfs base flow for the Canadian River at Logan as required by the ARSMP. Managed Compact releases were simulated whenever end-of-month storage would exceed 193,240 AF (the Compact storage limit of 200,000 AF less the upstream reservoir capacity of 6,760 AF). Spills were simulated in months when end-of-storage exceeded the reservoir capacity of 245,000 AF.

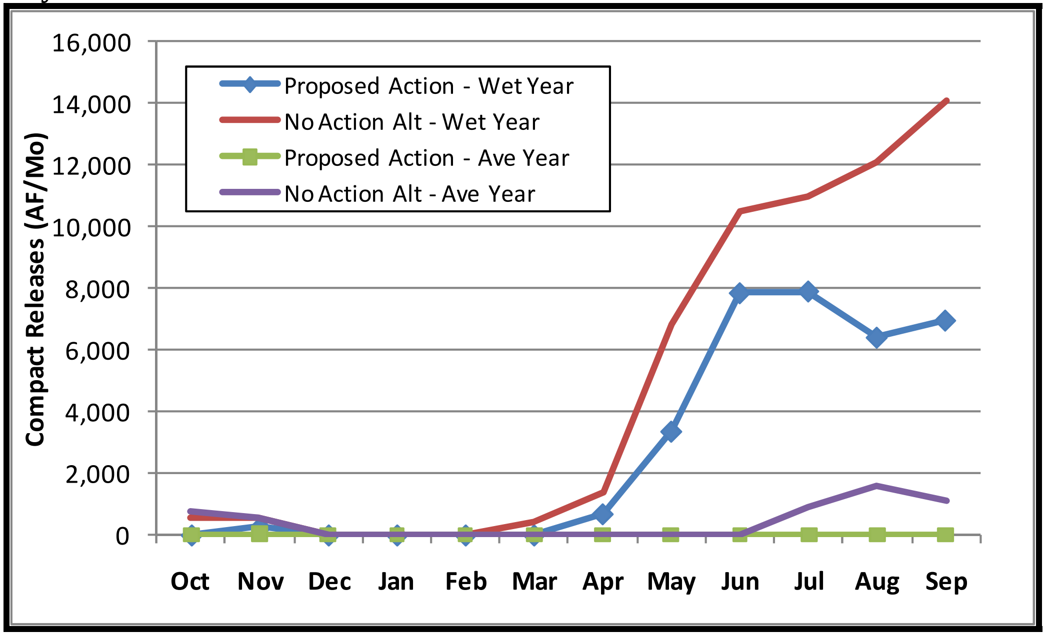
Average annual reservoir releases/spills are about 9,670 AF per year (46 percent) lower for the Proposed Action than for the No Action Alternative. The majority of releases from Ute Reservoir would occur at relatively high flows (150 to 325 cfs through the outlet works) over the span of at most, 8 months at a time for the No Action Alternative, and at most, 6 months at a time for the Proposed Action. There would be periods of higher releases/spills when releases would be made through the outlet works, and spills would also occur through the reservoir spillway. However, reservoir spills were simulated in only 3 months during the 41-year model period for both alternatives. Maximum monthly total releases/spills would be about 59,500 AF/mo for the Proposed Action and 76,000 AF/mo for the No Action Alternative.

Table 9. Simulated Ute Reservoir Releases/Spills

	Simulated Value		Effects	
	No Action Alternative	**Proposed Action**	**Magnitude**	**%**
Average Annual Releases/Spills (AFY)	23,940	12,860	-11,050	-46
Max Monthly Releases/Spills (AF/mo)	76,031	59,493	-16,538	-22%
# Months Compact Releases/Spills	69	40	-29	-42

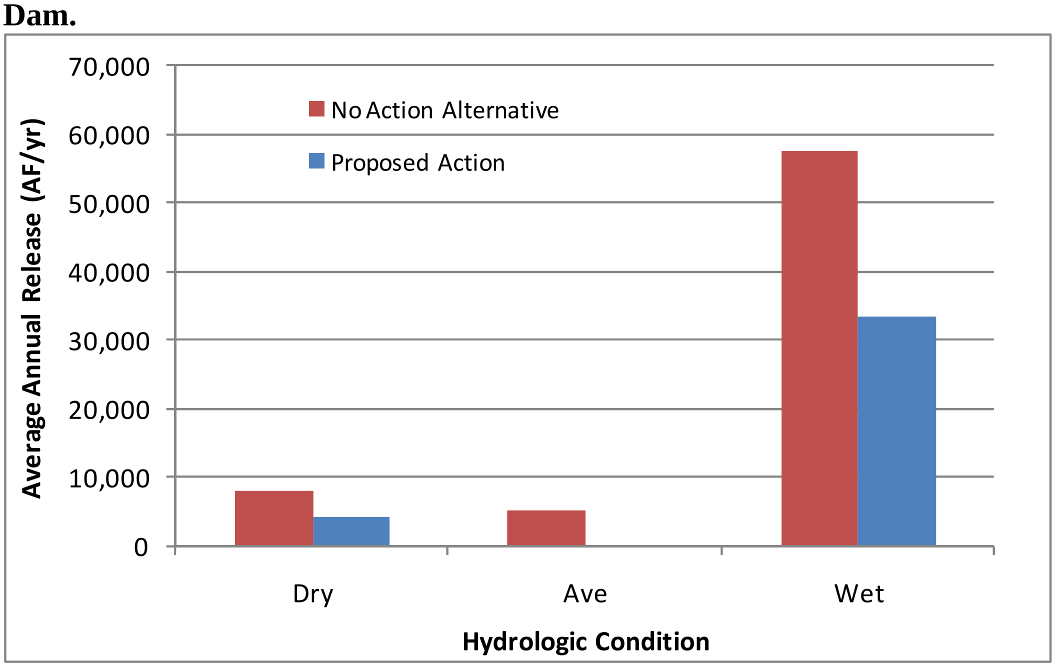
Differences in average annual Canadian River Compact releases/spills from Ute Reservoir (Figure 14 and Figure 15) would be greatest during wet years (about 24,000 AFY less for the Proposed Action), less for average years (about 4,900 AFY less for the Proposed Action), and the least for dry years (about 3,700 AFY less for the Proposed Action). Each of the years in the 41-year simulation period was classified as dry, average, or wet by ranking the simulated reservoir inflow for the years and dividing them into the lower third (dry years), middle third (average years), and upper third (wet years). The simulation period was determined to be reasonably representative of long-term hydrological variability for Ute Reservoir. As a result, division of the 41-year simulation period based on a ranking of simulated inflow was assumed to be a reasonable approximation of identifying hydrological conditions for the simulation period. While simulated average spills/releases are valuable for comparison of alternatives, it should be noted that spill/releases do not occur annually. The most recent Compact releases occurred in 2000 and 2006 (MWH 2009b). As described previously, Compact releases occur only when storage in Ute Reservoir exceeds the Compact maximum.

Figure 14. Monthly Distribution of Average Annual Releases for Average, Wet, and Dry Years.



Source: MWH 2009b

Figure 15. Average Annual Canadian River Compact Releases and Spills at Ute Dam.



Source: MWH 2009b

Releases from Ute Reservoir to maintain Canadian River base flow at the Logan gage (as required by the ARSMP) may increase for the Proposed Action when compared with the No Action Alternative. This increase could occur because of lower storage levels for the Proposed Action, which could result in lower seepage from Ute Reservoir. The correlation between reservoir storage and Canadian River streamflow cannot be proven to be causal, but if lower reservoir pools result in a measurable decline in stream flow the ISC would need to make small magnitude releases (less than 3 cfs) in order to comply with the ARSMP. Over the historical period of record since Ute Dam was raised in 1985, approximately 24 percent of average monthly flows at the Logan gage have been less than 3 cfs (USGS 2008). However, the Logan gage on the Canadian River has low accuracy due to the configuration of the channel at the gage location. The Logan gage is rated "Poor" by the USGS. This makes comparison of future flows to historic conditions or comparison of ARSMP releases among different alternatives difficult. ARSMP releases may need to be made more frequently because of the possibility of lower seepage resulting from lower Ute Reservoir storage levels for the Proposed Action relative to historical conditions.

Although Canadian River streamflow below Ute Reservoir was not explicitly modeled, potential effects on streamflow are described below. Streamflow and reservoir levels depend on inflow to the reservoir from the Canadian River below Conchas and from Ute Creek, in addition to evaporation and other losses. Below Ute Dam, Canadian River streamflow is made up of a combination of releases/spills from Ute Reservoir; base flow from ground water inflow from shallow aquifers adjacent to the Canadian River, and/or seepage from Ute Dam; and surface runoff from precipitation. Effects are described for the Canadian River between Ute Reservoir and the New Mexico and Texas state line. Effects on streamflow are generally described for two sections of the Canadian River: the Canadian River from Ute Dam to Revuelto Creek, and the Canadian River from Revuelto Creek to the state line.

Streamflow effects on the Canadian River between Ute Reservoir and Revuelto Creek could occur if there are changes in Ute Reservoir releases/spills as previously described. The average annual total releases/spills from Ute Reservoir (i.e., Canadian River Compact releases plus spills) would be 46 percent lower for the Proposed Action when compared to the No Action Alternative, and the releases would occur in 29 fewer months over the 41-year simulation period for the Proposed Action. These differences in Canadian River Compact releases could lead to an overall reduction in the magnitude and frequency of infrequent high flows at the Logan gage. The frequency of ARSMP releases (less than 3 cfs) could be higher for the Proposed Action than for the No Action Alternative, if lower storage levels for the Proposed Action lead to lower seepage to the Canadian River.

Effects on Canadian River streamflow between Revuelto Creek and the state line would have the same causes as the effects described for the reach between Ute Reservoir and Revuelto Creek, but the magnitude of effects would be reduced because of the influence of tributary inflow from Revuelto Creek and other inflow from ground water and surface runoff, and transit losses between Ute Reservoir and the state line. Tributary inflow from Revuelto Creek varies considerably, as described previously. High flows are higher and more common on Revuelto Creek than on the Canadian River below Ute Reservoir due to the influence of the reservoir; this tributary is most responsible for high flow magnitude and frequency in the downstream reach of the Canadian River. Revuelto Creek low flows are less than 4 cfs 50 percent of the time, and no flow occurs about 10 percent of the time. Because the 3-5 cfs historical flow below Ute Dam will be maintained, and because flows (including both flood flows and low flows), from Revuelto Creek would not change after the Project, there would be no alteration of base flow hydrology in the Canadian River upstream or downstream of Revuelto Creek. Alteration of flood flows below Revuelto Creek would be minimal and infrequent, and would only occur during times of concurrent storm runoff on Revuelto Creek and releases or spills from Ute Reservoir.

Effects on infrequent high flows downstream of Revuelto Creek would be slightly less than for the reach upstream of Revuelto Creek because of transit losses along the Canadian River. The frequency of effects of Ute Reservoir releases on streamflows would be the same for the two locations (69 months of releases over the 41-year simulation period for the No Action Alternative and 40 months of releases for the Proposed Action). The volume of releases at the state line would be less than the volume at Ute Reservoir for the No Action Alternative and the Proposed Action as a result of transit losses. The magnitude of effects would be less at the state line (average decrease of 10,410 AFY) than at Ute Dam (average decrease of 11,050 AFY), but the effects as a percentage would be the same for the two locations (46 percent decrease).

As described in above, streamflow effects for the Proposed Action for the Canadian River would be limited to a decrease in volume and frequency of Canadian River Compact releases and reservoir spills. Based on Lane's relationship as a conceptual geomorphic understanding, the product of sediment discharge and particle size is proportional to the product of water discharge and stream slope. Thus, the decrease in Canadian River streamflow would either result in sediment deposition (less sediment discharge) or an increase in stream slope (i.e., less meandering and more braiding). The Canadian River downstream of Ute Dam is currently experiencing minor erosion, and as a result, a decrease in streamflow would likely lead to a decrease in erosion and possibly a small amount of deposition. A decrease in erosion and/or increase in sedimentation for the Proposed Action compared to the No Action Alternative may result in the following geomorphic effects:

- Decreased removal of sediment associated with high flows, which could decrease the hydraulic capacity of the river to convey flood flows and releases from Ute Reservoir. Flood flows are generally small in magnitude and infrequent for the Canadian River downstream of Ute Dam and upstream of Revuelto Creek because of the influence of the dam (MWH 2008). However, when flood flows do occur, more frequent overbank flows could result due to reduced channel capacity.
- Increased growth of riparian vegetation along the streambank as a result of decreased scouring flows. The increase in riparian vegetation would cause an increase in hydraulic roughness in the overbank zone, which would decrease the hydraulic capacity of the river to convey flood flows and high flow releases from Ute Reservoir. Similar to the effects described in the previous bullet point, the increase in riparian vegetation would have a minor effect on the conveyance of Ute Reservoir releases and increase the frequency of overbank flows. The CRMWA is conducting regular phreatophyte control and monitoring per the ARSMP.

- Increased deposition could also result in more braided stream channel, enhanced opportunity for overbank flooding, and similar enhancements to ARS habitat.

Geomorphic effects for the Canadian River downstream of the confluence with Revuelto Creek would be similar, but would be smaller in magnitude. Infrequent high flows in this reach would be provided in large part by tributary inflow from Revuelto Creek. High flows from Revuelto Creek would mitigate the reduction in high flows from decreased Ute Reservoir releases, and would be capable of removing sediment and preventing increased riparian vegetation growth. Geomorphic effects would be expected to be negligible downstream of Revuelto Creek as a result.

These potential changes to ARS habitat, including changes in frequency and duration of Compact releases as well as resulting geomorphic effects, could result in minor, immeasurable impacts to shiner forage, reproduction, and other life cycle requirements.

Direct effects to ARS habitat in Revuelto Creek would be minimized by using boring rather than trenching to install the pipeline. Bore pits would be installed outside of the channel and floodplain of Revuelto Creek. Boring activities at this location would occur for about 7 to 14 days. Temporary vibrations and noise during construction of the bore pits and from boring activities may deter ARS use of habitat in the vicinity. After construction is complete, ARS use would likely resume immediately.

5.3.1. Effects to Interior Least Tern

Model simulation of Ute Reservoir levels suggests that reservoir levels would be lower under the Proposed Project (MWH 2009b). Lower reservoir pool levels at Ute Reservoir would potentially expose additional shoreline and could create new interior least tern habitat. However, the majority of the shoreline along Ute Reservoir, above the 3,806 ft elevation, is privately or State owned and could be altered or affected by individual landowners or the ISC. The ISC owns in fee, all lands up to 3,787 ft. elevation, and maintains a flowage easement on private or other fee lands up to 3,806 ft. elevation. The flowage easement prohibits permanent improvements and limits other improvements on such lands. Further, as the Reservoir drops, more ISC fee lands are exposed. Additionally, based on review of current conditions and bathymetry, it does not appear that large expanses of unvegetated rocky or sandy substrate would be exposed at lower lake levels. Annual vegetation establishes quickly in flatter topography, and many areas of the reservoir shoreline are steep and would preclude interior least tern nesting.

If interior least terns nest along the reservoir shoreline in suitable habitat exposed during low reservoir levels, there are no operational components of the Project that would result in rapid lake rise and inundation of nests.

5.3.2. Effects to Arkansas River Shiner

As discussed in previous sections, modeled changes to reservoir releases/spills from the Proposed Project could potentially affect downstream habitat for the shiner. Table 10 summarizes important habitat components for the shiner, and the potential effects from the Proposed Project.

Table 10. Habitat Components and Potential Effects to the Arkansas River Shiner

Habitat Component	Potential Effect of the Proposed Project
Canadian River baseflow	No effect. Maintenance of baseflow (3 to 5 cfs) is an ARSMP requirement.
Canadian River flows	Decreased duration and frequency of Compact releases/spills could change ARS habitat for better or for worse (see discussion items below).
Canadian River fluvial geomorphology	Decreased total flows and higher flow frequency from Reservoir Compact releases/spills (Ute Dam release flows approximately 325 cfs) upstream of Revuelto Creek confluence; Revuelto Creek flows provide scouring downstream of confluence.
Canadian River riparian vegetation	Potential for increased growth of riparian vegetation along the streambank as a result of decreased scouring flows (upstream of Revuelto Creek confluence); minimal effects downstream of confluence. Control of riparian vegetation is an ARSMP requirement.
Canadian River flood flows	No change from existing conditions except for small reduction in spills from Ute Dam; Revuelto Creek provides flood flows adequate in magnitude and frequency to trigger spawning. In addition, normal base flows appear to be adequate for reproduction, in the absence of higher or flood flows.
Canadian River water quality	Changes in Reservoir releases/spills could change the annual average TDS concentration in the Canadian River, but would not change the normal range of concentrations (MWH 2009a).
Revuelto Creek habitat	Creek crossing would be accomplished via trenchless technology. No direct impacts to Revuelto Creek habitat would occur. ARS may temporarily avoid project area habitat during boring due to noise and vibratory impacts.

CHAPTER 6. CUMULATIVE EFFECTS

Cumulative effects are the direct and indirect effects of a proposed project alternative's incremental effects when they are added to other past, present, and reasonably foreseeable actions, regarding State or private activities that are reasonably certain to occur within the project area (50 CFR, Part 402.02). For the purposes of this BA, a temporal boundary of analysis from approximately 2010 to 2060 has been considered, which represents the project planning horizon. However, forecasting potential cumulative effects 50 years in advance is difficult, and most of the cumulative effects analysis is general and qualitative in nature.

6.1. Reasonably Foreseeable Actions

In the absence of the ENMRWS Project, NMISC would seek to put Ute Reservoir water to beneficial use (domestic, M&I, and irrigation uses) by pursuing other purchasers.

6.1.1 Twelve Shores at Ute Lake and Quay County Entity Water Use

Entities in Quay County, including those representing the residential development Twelve Shores at Ute Lake, formerly known as Ute Lake Ranch, have a combined reservation of 7,550 AFY of Ute Reservoir water under the 1997 ISC/URWC Water Contract. Determining the amount of water that may reasonably be used by these entities requires reviewing permitting/platting information, potential population change leading to demand changes, and other factors that are challenging to predict. Rather than predicting an absolute amount of future water use, a "low" and "high" estimate were modeled and analyzed. The entire combined water reservation was used as the "high" estimate, and the demand for Ute Reservoir withdrawals was assumed to be 24,000 AFY for this scenario (Table 11; CE-High). For the "low" estimate, the portion of the reservation that would be needed to meet anticipated demands associated with land development that is permitted/platted was used (Table 11; CE-Low). The Twelve Shores golf course has been permitted/platted through Quay County, with the first nine holes constructed, and currently requires about 500 AFY of raw water (Garside, pers. comm. 2009). The residential portion of Twelve Shores and the area development that is permitted/platted currently uses existing on-site wells and water pumped from Logan's well fields for potable water.

Table 11. Simulated Results and Cumulative Effects for Ute Reservoir Conditions.

	Simulated Value				Effects (Magnitude)[2]			Effects (Percentage)[2]		
	NAA	**DE–PA**	**CE–Low**	**CE–High**	**DE-PA**	**CE–Low**	**CE-High**	**DE-PA**	**CE–Low**	**CE-High**
Storage (AF)										
Min	122,040	50,140	47,590	26,410	-71,900	-74,450	-95,630	-59%	-61%	-78%
Ave	174,350	146,130	145,020	129,240	-28,220	-29,330	-45,110	-16%	-17%	-26%
Stage (ft)										
Min	3,772	3,751	3,750	3,738	-21	-22	-34	-1%	-1%	-1%
Ave	3,781	3,775	3,775	3,771	-6	-6	-10	0%	0%	0%
Depth (ft)										
Min	64	43	42	30	-21	-22	-34	-33%	-34%	-53%
Ave	73	67	67	63	-6	-6	-10	-8%	-8%	-14%
Area (ac)										
Min	4,923	2,499	2,401	1,568	-2,424	-2,522	-3,355	-49%	-51%	-68%
Ave	6,289	5,508	5,475	4,996	-781	-814	-1,293	-12%	-13%	-21%
Total Releases[1] (AFY)										
Min	0	0	0	0	0	0	0	0%	0%	0%
Ave	23,910	12,860	12,590	9,011	-11,050	-11,320	-14,899	-46%	-47%	-62%
Max	210,610	148,170	146,300	113,295	-62,440	-64,310	-97,315	-30%	-31%	-46%
# Months Releases/Spills	69	40	38	27	-29	-31	-42	-42%	-45%	-61%

NAA =No Action Alternative; DE-PA = Direct Effects under the Proposed Action; CE-Low = Cumulative Effects-Low; CE-High = Cumulative Effects-High.
[1] Total releases include releases/spills made to meet the Compact requirement of 200,000 AF maximum conservation storage between Conchas and Ute dams, and spills through the Ute Reservoir spillway.
[2] Direct and cumulative effects calculated relative to the No Action Alternative.

As Table 11 shows, the "low" end of the cumulative effects would be very similar to the impacts from the Proposed Action. The "high" end of the cumulative effects range would be greater than the Proposed Action, as shown in the right-hand column of Table 11. Figure 16 shows the projected changes in Ute Reservoir storage from both the "low" end and "high" end of demands from Quay County and Ute Lake Ranch. Figure 17 represents the simulated reservoir releases/spills during a variety of hydrology conditions—dry, average, and wet years. During average and dry years, the magnitude of change would be less than in wet years.

Figure 16. Cumulative Effects to Ute Reservoir Storage.

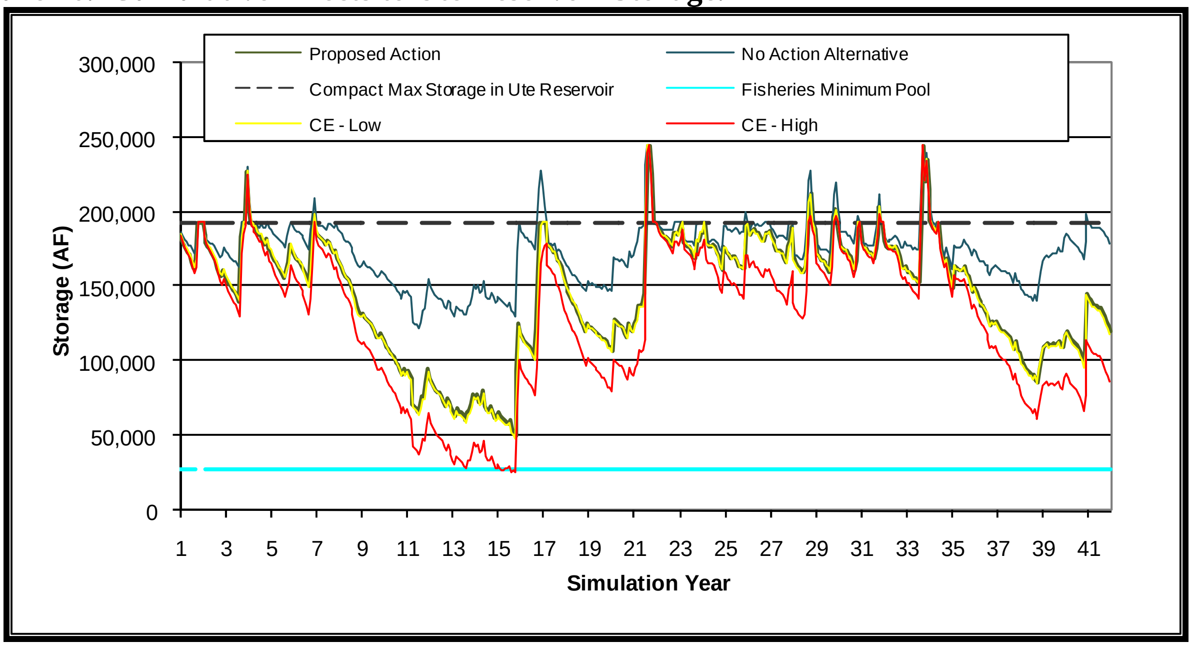
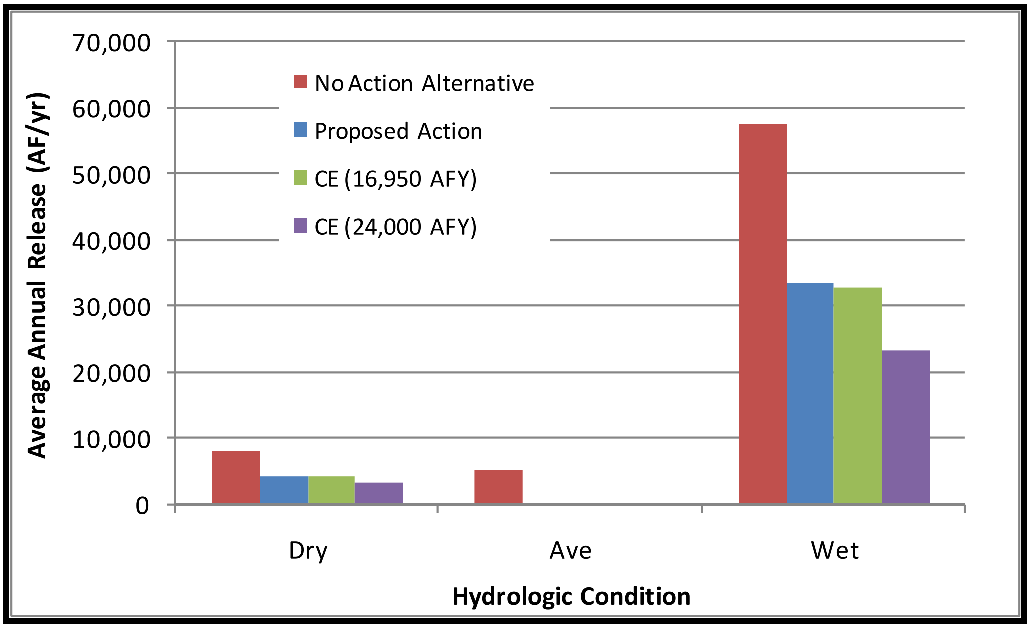


Figure 17. Simulated Ute Reservoir Releases/Spills.



6.1.1. Climate Change

Climate changes have the potential to influence precipitation and weather patterns in the Project Area, and may have cumulative effects with the water resources-related impacts of the Project. Localized effects of climate change are difficult to predict. Federal perspectives (Brekke et al. 2009) and New Mexico information (Enquist and Gori 2008) were considered in this evaluation. Increased variability of precipitation (including more extreme events) and increased average temperature are general global climate change trends. In their New Mexico studies, Enquist and Gori (2008) concluded that recent (20-year) trends have been toward warmer and wetter conditions in eastern New Mexico. It is assumed that these trends are indicative of future climate change consequences in the Project Area.

Given the potential effect to water resources from climate change, this assessment addresses climate change from two perspectives: 1) how the Project may affect global climate change, and 2) how the Project may be affected by climate change.

A temporary increase in greenhouse gases would result from construction of the Project. Greenhouse gas emissions would occur over the time period required for construction, and would potentially contribute to incremental climate change. The Project would replace an existing groundwater supply system and associated pumping and treatment demands. Because the Project would consolidate energy demands for pumping, treatment, and deliver, there would likely be some efficiency gained and a potential reduction in energy use. In the context of climate change, there would be no measurable changes in the composition of the atmosphere or in land use associated with the Proposed Action. Therefore, the Project would have only minor or immeasurable impacts on climate change.

The Project may be affected by climate change if a warming climate results because a more rapid melt of the snowpack will occur and, therefore, more runoff will occur in the winter and early spring and less during the later spring and early summer.

Increased annual precipitation in the Project would tend to moderate the effects of the Project on Ute Reservoir levels, and increase the volume and frequency of Ute Reservoir spills and Compact releases. An increase in precipitation extremes could lead to more frequent high flows in Project Area streams, increasing the potential for erosion and sedimentation. Warmer temperatures would potentially increase evaporation from Ute Reservoir and increase the reservoir water level effects. Warmer temperatures also would increase water demand from agricultural and M&I customers in the Participating Communities, exacerbating Ogallala aquifer ground water declines and accelerating the need for a sustainable water source that would be provided by the Project.

CHAPTER 7. DETERMINATION OF EFFECTS

7.1. Introduction

The following determination of effects for the interior least tern and shiner considers direct and indirect effects of the Proposed Action on the listed species together with the effect of other activities that are interrelated or interdependent with the action.

7.2. Interior Least Tern

At present there are no interior least terns nesting at Ute Reservoir. There are no documented records of this species nesting at Ute Reservoir. It is anticipated that water levels in Ute Reservoir would be between 5 and 15 feet lower under the Proposed Action vs. the No Action Alternative. However, Ute Reservoir is surrounded by steep banks, rocky cliffs, and heavily vegetated wetlands. The potentially lower water levels would not expose large, bare, sandbars dominated by gravel or cobble favored by the interior least tern. Level areas surrounding the reservoir that might be exposed due to lower water levels would become rapidly vegetated because of the presence of wetlands around the reservoir. Additionally, much of the shoreline of the reservoir is privately owned. In addition, as much of the land surrounding the reservoir is private, no assurances relative to the interior least tern could be made. The Proposed Project will not likely create habitat for this species. Therefore, it is determined that activities associated with the Proposed Project will have no effect on the interior least tern.

7.2.1. Take

The Project will not result in take of the interior least tern. The species does not occur at Ute Reservoir, within the Canadian River between the New Mexico and Texas state line, or along the proposed pipeline routes.

7.3. Arkansas River Shiner

The Proposed Action will continue to provide a target flow of between 3 and 5 cfs in the Canadian River downstream of Ute Dam. Base flows immediately below Ute Dam would not be altered by the Project. Revuelto Creek normal flows and flood flows would not be impacted by the Project. Control of riparian vegetation along the Canadian River is an obligation under the ARSMP. In light of these variables, the Proposed Project may affect, but is not likely to adversely affect, the shiner.

7.3.1. Take

The Project will not result in take of the shiner. There is no designated critical habitat in the Project Area, and none would be affected by the Proposed Project.

CHAPTER 8. REFERENCES

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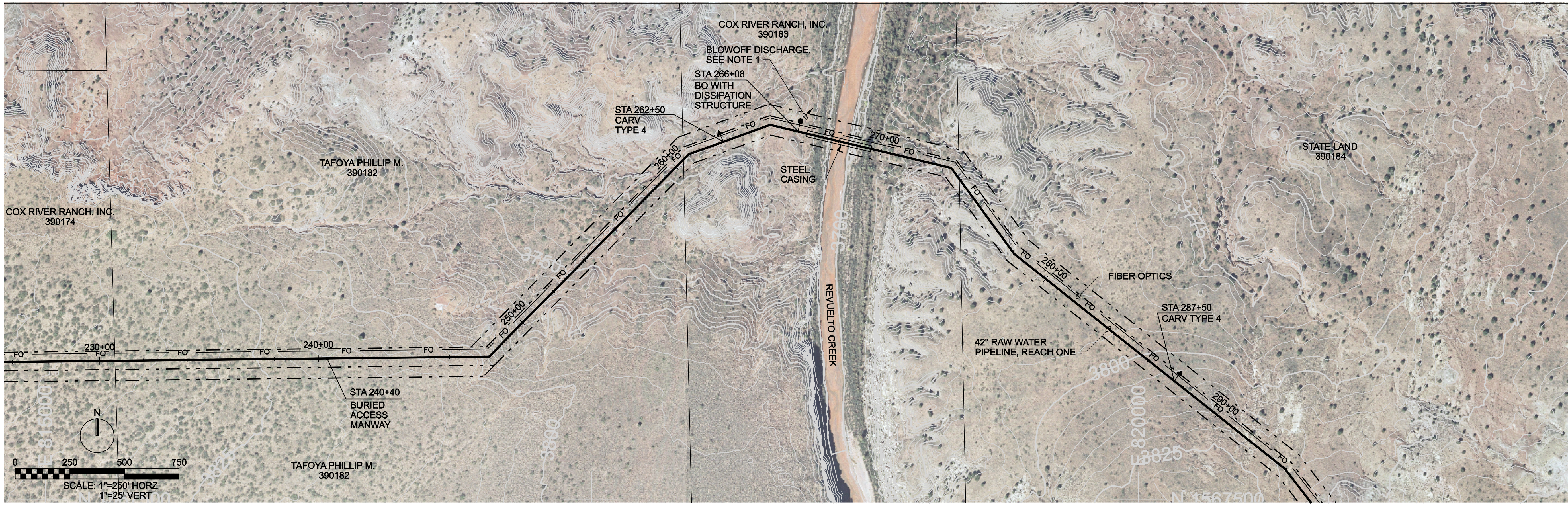
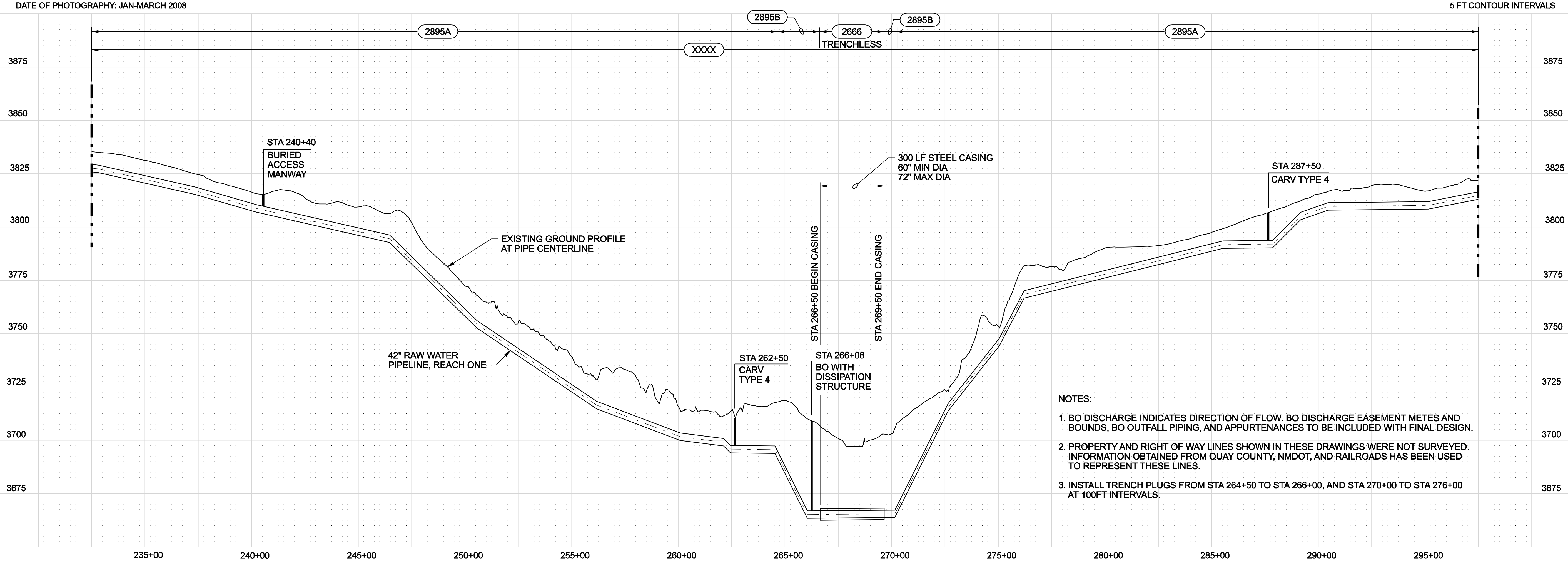
Appendix A. Revuelto Creek Boring Location



DATE OF PHOTOGRAPHY: JAN-MARCH 2008

5 FT CONTOUR INTERVALS



NOTES:

1. BO DISCHARGE INDICATES DIRECTION OF FLOW. BO DISCHARGE EASEMENT METES AND BOUNDS, BO OUTFALL PIPING, AND APPURTENANCES TO BE INCLUDED WITH FINAL DESIGN.
2. PROPERTY AND RIGHT OF WAY LINES SHOWN IN THESE DRAWINGS WERE NOT SURVEYED. INFORMATION OBTAINED FROM QUAY COUNTY, NMDOT, AND RAILROADS HAS BEEN USED TO REPRESENT THESE LINES.
3. INSTALL TRENCH PLUGS FROM STA 264+50 TO STA 266+00, AND STA 270+00 TO STA 276+00 AT 100FT INTERVALS.

NO.	DATE	REVISION	BY	APVD

DSGN	DR	CHK	APVD
A VAUGHAN	B NORVILLE	STILLMUNKES/HILL	W CHRISTOFFERSON

ENMRWS
EASTERN NEW MEXICO
RURAL WATER AUTHORITY
RAW WATER PIPELINE - REACH ONE

CH2MHILL

PLAN AND PROFILE
RAW WATER PIPELINE - REACH ONE
REVUELTO CREEK CROSSING

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
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DATE	FEB 2009
PROJ	363831.LS
DWG	PP-5a
SHEET	38

FILENAME: dnRW05App_363831.dgn PLOT DATE: 4/9/2009 PLOT TIME: 11:30:27 AM

Appendix B. Compact, Amended Decree, and Project Authorization

CANADIAN RIVER COMPACT

The state of New Mexico, the state of Texas, and the state of Oklahoma, acting through their commissioners, John H. Bliss, for the state of New Mexico, E. V. Spence for the state of Texas, and Clarence Burch for the state of Oklahoma, after negotiations participated in by Berkeley Johnson, appointed by the president as the representative of the United States of America, have agreed respecting Canadian river as follows:

ARTICLE I

The major purposes of this compact [this section] are to promote interstate comity; to remove causes of present and future controversy; to make secure and protect present developments within the states; and to provide for the construction of additional works for the conservation of the waters of Canadian river.

ARTICLE II

As used in this compact:

(a) the term "Canadian river" means the tributary of Arkansas river which rises in northeastern New Mexico and flows in an easterly direction through New Mexico, Texas and Oklahoma and includes North Canadian river and all other tributaries of said Canadian river;

(b) the term "North Canadian river" means that major tributary of Canadian river officially known as North Canadian river from its source to its junction with Canadian river and includes all tributaries of North Canadian river;

(c) the term "commission" means the agency created by this compact for the administration thereof;

(d) the term "conservation storage" means that portion of the capacity of reservoirs available for the storage of water for subsequent release for domestic, municipal, irrigation and industrial uses, or any of them, and it excludes any portion of the capacity of reservoirs allocated solely to flood control, power production and sediment control, or any of them.

ARTICLE III

All rights to any of the waters of Canadian river which have been perfected by beneficial use are hereby recognized and affirmed.

ARTICLE IV

(a) New Mexico shall have free and unrestricted use of all waters originating in the drainage basin of Canadian river above Conchas dam.

(b) New Mexico shall have free and unrestricted use of all waters originating in the drainage basin of Canadian river in New Mexico below Conchas dam, provided that the amount of conservation storage in New Mexico available for impounding these waters which originate in the drainage basin of Canadian river below Conchas dam shall be limited to an aggregate of 200,000 acre-feet.

(c) The right of New Mexico to provide conservation storage in the drainage basin of North Canadian river shall be limited to the storage of such water as at the time may be unappropriated under the laws of New Mexico and of Oklahoma.

ARTICLE V

Texas shall have free and unrestricted use of all waters of Canadian river in Texas, subject to the limitations upon storage of water set forth below:

(a) the right of Texas to impound any of the waters of North Canadian river shall be limited to storage on tributaries of said river in Texas for municipal uses, for household and domestic uses, livestock watering, and the irrigation of lands which are cultivated solely for the purpose of providing food and feed for the householders and domestic livestock actually living or kept on the property;

(b) until more than 300,000 acre-feet of conservation storage shall be provided in Oklahoma, exclusive of reservoirs in the drainage basin of North Canadian river and exclusive of reservoirs in the drainage basin of Canadian river east of the 97th meridian, the right of Texas to retain water in conservation storage, exclusive of waters of North Canadian river, shall be limited to 500,000 acre-feet; thereafter the right of Texas to impound and retain such waters in storage shall be limited to an aggregate quantity equal to 200,000 acre-feet plus whatever amount of water shall be at the same time in conservation storage in reservoirs in the drainage basin of Canadian river in Oklahoma, exclusive of reservoirs in the drainage basin of North Canadian river and exclusive of reservoirs east of the 97th meridian; and for the purpose of determining the amount of water in conservation storage, the maximum quantity of water in storage following each flood or series of floods shall be used; provided, that the right of Texas to retain and use any quantity of water previously impounded shall not be reduced by any subsequent application of the provisions of this Paragraph (b);

(c) should Texas for any reason impound any amount of water greater than the aggregate quantity specified in Paragraph (b) of this article, such excess shall be retained in storage until under the provisions of said paragraph Texas shall become entitled to its use; provided, that, in event of spill from conservation storage, any such excess shall be reduced by the amount of such spill from the most easterly reservoir on Canadian river in Texas; provided further, that all such excess quantities in storage shall be reduced monthly to compensate for reservoir losses in proportion to the total amount of water in the reservoir or reservoirs in which such excess water is being held; and provided further that on demand by the commissioner for Oklahoma the remainder of any such excess quantity of water in storage shall be released into the channel of Canadian river at the greatest rate practicable.

ARTICLE VI

Oklahoma shall have free and unrestricted use of all waters of Canadian river in Oklahoma.

ARTICLE VII

The commission may permit New Mexico to impound more water than the amount set forth in Article IV and may permit Texas to impound more water than the amount set forth in Article V; provided, that no state shall thereby be deprived of water needed for beneficial use; provided further that each such permission shall be for a limited period not exceeding twelve months; and provided further that no state or user of water within any state shall thereby acquire any right to the continued use of any such quantity of water so permitted to be impounded.

ARTICLE VIII

Each state shall furnish to the commission at intervals designated by the commission accurate records of the quantities of water stored in reservoirs pertinent to the administration of this compact [this section].

ARTICLE IX

(a) There is hereby created an interstate administrative agency to be known as the "Canadian river commission." The commission shall be composed of three commissioners, one from each of the signatory states, designated or appointed in accordance with the laws of each such state, and if designated by the president an additional commissioner representing the United States. The president is hereby requested to designate such a commissioner. If so designated, the commissioner representing the United States shall be the presiding officer of the commission, but shall not have the right to vote in any of the deliberations of the commission. All members of the commission must be present to constitute a quorum. A unanimous vote of the commissioners for the three signatory states shall be necessary to all actions taken by the commission.

(b) The salaries and personal expenses of each commissioner shall be paid by the government which he represents. All other expenses which are incurred by the commission incident to the administration of this compact and which are not paid by the United States shall be borne equally by the three states and be paid by the commission out of a revolving fund hereby created to be known as the "Canadian river revolving fund." Such fund shall be initiated and maintained by equal payments of each state into the fund in such amounts as will be necessary for administration of this compact. Disbursements shall be made from said fund in such manner as may be authorized by the commission. Said fund shall not be subject to the audit and accounting procedures of the states. However, all receipts and disbursements of funds handled by the commission shall be audited by a qualified independent public accountant at regular intervals and the report of the audit shall be included in and become a part of the annual report of the commission.

(c) The commission may:
(1) employ such engineering, legal, clerical and other personnel as in its judgment may be necessary for the performance of its functions under this compact;
(2) enter into contracts with appropriate federal agencies for the collection, correlation and presentation of factual data, for the maintenance of records, and for the preparation of reports;
(3) perform all functions required of it by this compact and do all things necessary, proper or convenient in the performance of its duties hereunder, independently or in cooperation with appropriate governmental agencies.

(d) The commission shall:
(1) cause to be established, maintained and operated such stream and other gaging stations and evaporation stations as may from time to time be necessary for proper administration of the compact, independently or in cooperation with appropriate governmental agencies;
(2) make and transmit to the governors of the signatory states on or before the last day of March of each year, a report covering the activities of the commission for the preceding year;
(3) make available to the governor of any signatory state, on his request, any information within its possession at any time, and shall always provide access to its records by the governors of the states, or their representatives, or by authorized representatives of the United States.

ARTICLE X

(a) affecting the obligations of the United States to the Indian tribes;

(b) subjecting any property of the United States, its agencies or instrumentalities, to taxation by any state or subdivision thereof, or creating any obligation on the part of the United States, its agencies or instrumentalities, by reason of the acquisition, construction or operation of any property or works of whatever kind, to make any payment to any state or political subdivision thereof, state agency, municipality or entity whatsoever, in reimbursement for the loss of taxes;

(c) subjecting any property of the United States, its agencies or instrumentalities, to the laws of any state to an extent other than the extent to which such laws would apply without regard to this compact;

(d) applying to, or interfering with, the right or power of any signatory state to regulate within its boundaries the appropriation, use and control of water, not inconsistent with its obligations under this compact;

(e) establishing any general principle or precedent applicable to other interstate streams.

ARTICLE XI

This compact shall become binding and obligatory when it shall have been ratified by the legislature of each state and approved by the congress of the United States. Notice of ratification by the legislature of each state shall be given by the governor of that state to the governors of the other states and to the president of the United States. The president is hereby requested to give notice to the governor of each state of approval by the congress of the United States.

In witness whereof, the commissioners have executed four counterparts hereof, each of which shall be and constitute an original, one of which shall be deposited in the archives of the department of state of the United States, and one of which shall be forwarded to the governor of each state.

Done at the city of Santa Fe, state of New Mexico, this 6th day of December, 1950.

/s/ JOHN H. BLISS
John H. Bliss
Commissioner for the state of
New Mexico

/s/ E. V. SPENCE
E. V. Spence
Commissioner for the state of
Texas

/s/ CLARENCE BURCH
Clarence Burch
Commissioner for the state of
Oklahoma

APPROVED:
/s/ BERKELEY JOHNSON
Berkeley Johnson
Representative of the United
States of America

The state of New Mexico ratified, approved and adopted the compact in 1951 (1978 Comp., § 72-15-2, enacted by Laws 1951, ch. 4, § 1.)

OKLAHOMA ET AL. *v.* NEW MEXICO

ON JOINT MOTION FOR ENTRY OF STIPULATED JUDGMENT AND DECREE

No. 109, Orig. Decided June 17, 1991—Judgment and decree entered December 13, 1993

Judgment and decree entered.

Opinion reported: 501 U. S. 221.

The joint motion for entry of stipulated judgment and decree, as modified, is granted.

STIPULATED JUDGMENT, AS MODIFIED

1. New Mexico has been in violation of Article IV(b) of the Canadian River Compact from 1987 to date.

2. Pursuant to Paragraph 8 of the Decree entered in this case, New Mexico shall release from Ute Reservoir in 1993 sufficient water to result in an aggregate of not more than 200,000 acre-feet of conservation storage below Conchas Dam in New Mexico, including conservation storage in the other reservoirs subject to the limitation under Article IV(b) of the Canadian River Compact. The release of water from Ute Reservoir will be coordinated with Oklahoma and Texas and will be at the call of Texas.

3. New Mexico shall also release from Ute Reservoir an additional 25,000 acre-feet of storage below the Article IV(b) limitation. New Mexico shall operate Ute Reservoir through the year 2002 at or below the elevations set forth in the schedule below and in accordance with the provisions of Paragraph 8 of the Decree entered in this case. The schedule includes annual adjustments for sediment accumulation in Ute Reservoir and assumes the other reservoirs subject to the Article IV(b) limitation maintain storage at their total capacity of 6,760 acre-feet. The schedule shall be adjusted by the parties to reflect additional amounts of water in conservation storage in any reservoir enlarged or constructed

after 1992. Releases of water from Ute Reservoir will be coordinated with Oklahoma and Texas and will be at the call of Texas.

Ute Reservoir Operating Schedule

	Year	Authorized Elevation	Reduced Storage Amount	Corresponding Reduced Elevation
After release in	1993	3781.58	25,000	3777.86
	1994	3781.66	25,000	3777.95
	1995	3781.74	25,000	3778.04
	1996	3781.83	25,000	3778.14
	1997	3781.91	25,000	3778.23
	1998	3781.99	20,000	3779.08
	1999	3782.08	15,000	3779.91
	2000	3782.16	6,250	3781.28
	2001	3782.24	3,125	3781.80
Refilled in	2002	3782.32	-0-	3782.32

4. Within 75 days after entry of judgment New Mexico shall pay as attorney's fees $200,000 to Texas and $200,000 to Oklahoma. The parties agree that such payments do not constitute and shall not be considered as an admission, express or implicit, that New Mexico has any liability to Texas or Oklahoma for attorney's fees.

5. Oklahoma and Texas shall release New Mexico from all claims for equitable or legal relief, other than the relief embodied in the Decree of the parties, arising out of New Mexico's violation of the Canadian River Compact during the years 1987 through the date this Stipulated Judgment is entered.

6. In the event of a conflict between this Judgment and the Decree entered in this case, the provisions of the Judgment shall control.

7. The costs of this case shall be equally divided among the parties.

DECREE, AS MODIFIED

1. Under Article IV(a) of the Canadian River Compact (Compact), New Mexico is permitted free and unrestricted use of the waters of the Canadian River and its tributaries in New Mexico above Conchas Dam, such use to be made above or at Conchas Dam, including diversions for use on the Tucumcari Project and the Bell Ranch and the on-project storage of return flow or operational waste from those two projects so long as the recaptured water does not include the mainstream or tributary flows of the Canadian River; provided that transfers of water rights from above Conchas Dam to locations below Conchas Dam shall be subject to the conservation storage limitation of Compact Article IV(b). Nothing in this paragraph shall be deemed to determine whether or not the place of use of water rights may be transferred to locations outside the Canadian River basin in New Mexico.

2. Under Compact Article IV(b), New Mexico is limited to storage of no more than 200,000 acre-feet of the waters of the Canadian River and its tributaries, regardless of point of origin, at any time in reservoirs in the Canadian River basin in New Mexico below Conchas Dam for any beneficial use, exclusive of water stored for the exempt purposes specified in Compact Article II(d) and on-project storage of irrigation return flows or operational waste on the Tucumcari Project and Bell Ranch as provided for in Paragraph 1 of this Decree.

3. Quantities of water stored primarily for flood protection, power generation, or sediment control are not chargeable as conservation storage under the Compact even though incidental use is made of such waters for recreation, fish and wildlife, or other beneficial uses not expressly mentioned in the Compact. In situations where storage may be for multiple purposes, including both conservation storage and exempt storage, nothing in this Decree shall preclude the Canadian River Commission (Commission) from exempting

an appropriate portion of such storage from chargeability as conservation storage.

4. Water stored at elevations below a dam's lowest permanent outlet works is not chargeable as conservation storage under the Compact unless the primary use of that storage is for a nonexempt purpose, or unless other means, such as pumps, are utilized to discharge such storage volumes from the reservoir. No change in the location of a dam's lowest permanent outlet works to a higher elevation shall provide the basis for a claim of exempt status for all water stored below the relocated outlet works without prior approval of the Commission, which shall not be unreasonably withheld. Water stored for nonexempt purposes behind a dam with capacity in excess of 100 acre-feet and with no outlet works is chargeable as conservation storage.

5. Future designation or redesignation of storage volumes for flood control, power production, or sediment control purposes must receive prior Commission approval to be exempt from chargeability as conservation storage, which approval shall not be unreasonably withheld.

6. All water stored in Ute Reservoir above elevation 3,725 feet is conservation storage; provided that at such time as the authorization and funding of the Eastern New Mexico Water Supply Project or other project results in changed circumstances at Ute Reservoir, New Mexico may seek exemption of a reasonable portion of such water from the Commission under Paragraph 5 of this Decree and, if an exemption is denied, may petition the Court for appropriate relief under Paragraph 11 of this Decree.

7. In 1988 there were 63 small reservoirs in New Mexico with capacities of 100 acre-feet or less with a total capacity of about 1,000 acre-feet, which the Commission has treated as *de minimis* by waiving storage volume reporting obligations. Water stored in these reservoirs or in similarly sized reservoirs in the future is not chargeable as conservation storage, unless otherwise determined by the Commission.

8. Based on the elevation-capacity relationship of Ute Reservoir effective January 1, 1993, and adjustments pursuant to Paragraph 9 of this Decree, New Mexico shall make and maintain appropriate releases of water from Ute Reservoir or other conservation storage facilities in excess of 100 acre-feet of capacity at the maximum rate consistent with safe operation of such reservoirs so that total conservation storage in the Canadian River basin below Conchas Dam in New Mexico is limited to no more than 200,000 acre-feet at any time; provided that operation of Ute Reservoir for the period 1993–2002 shall be pursuant to the schedule contained in the Judgment entered in this case; and provided that no violation of this paragraph will occur during any period in which the outlet works of Ute Reservoir are discharging water at the maximum safe discharge capacity (currently 350 cubic feet per second) following the first knowledge that the 1993–2002 schedule or the Article IV(b) limitation after 2002 probably would be exceeded; and provided further that Texas shall be notified by New Mexico prior to a release and may allow New Mexico to retain water in conservation storage in excess of the 1993–2002 schedule or the Article IV(b) limitation after 2002, subject to the call of Texas and subject to the provisions of Article V of the Compact. The outlet works of Ute Reservoir shall be maintained in good working order and shall not be modified to reduce the safe discharge capacity without prior approval of the Commission, which shall not be unreasonably withheld.

9. Sediment surveys of Ute Reservoir shall be conducted at least every 10 years by New Mexico, unless such requirement is waived by the Commission. Conservation storage in Ute Reservoir shall be determined from the most recent sediment survey and an annual estimate of the total additional sediment deposition in the reservoir using an annual average of sediment accumulation during the period between 1963 and the most recently completed survey.

10. Nothing in this Decree is intended to affect a State's rights or obligations under the Compact, except as specifically addressed herein.

11. The Court retains jurisdiction of this suit for the purposes of any order, direction, or modification of this Decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy; provided, that any party requesting the Court to exercise its jurisdiction under this paragraph or answering such request shall certify that it has attempted to negotiate in good faith with the other parties in an effort to resolve the dispute sought to be brought before the Court.

(A) in-kind services that the Secretary determines would contribute substantially toward the completion of the project;

(B) reasonable costs incurred by the District as a result of participation in the planning, design, permitting, and construction of the Project; and

(C) the acquisition costs of lands used or acquired by the District for the Project.

(5) LIMITATION.—The Secretary shall not provide funds for the operation or maintenance of the Project authorized by this subsection. The operation, ownership, and maintenance of the Project shall be the sole responsibility of the District.

(6) PLANS AND ANALYSES CONSISTENT WITH FEDERAL LAW.—Before obligating funds for design or construction under this subsection, the Secretary shall work cooperatively with the District to use, to the extent possible, plans, designs, and engineering and environmental analyses that have already been prepared by the District for the Project. The Secretary shall ensure that such information as is used is consistent with applicable Federal laws and regulations.

(7) TITLE; RESPONSIBILITY; LIABILITY.—Nothing in this subsection or the assistance provided under this subsection shall be construed to transfer title, responsibility, or liability related to the Project to the United States.

(8) AUTHORIZATION OF APPROPRIATION.—There is authorized to be appropriated to the Secretary to carry out this subsection $22,500,000 or 25 percent of the total cost of the Project, whichever is less.

(e) SUNSET.—The authority of the Secretary to carry out any provisions of this section shall terminate 10 years after the date of the enactment of this Act.

SEC. 9103. EASTERN NEW MEXICO RURAL WATER SYSTEM PROJECT, NEW MEXICO.

(a) DEFINITIONS.—In this section:

(1) AUTHORITY.—The term “Authority” means the Eastern New Mexico Rural Water Authority, an entity formed under State law for the purposes of planning, financing, developing, and operating the System.

(2) ENGINEERING REPORT.—The term “engineering report” means the report entitled “Eastern New Mexico Rural Water System Preliminary Engineering Report” and dated October 2006.

(3) PLAN.—The term “plan” means the operation, maintenance, and replacement plan required by subsection (c)(2).

(4) SECRETARY.—The term “Secretary” means the Secretary of the Interior.

(5) STATE.—The term “State” means the State of New Mexico.

(6) SYSTEM.—

(A) IN GENERAL.—The term “System” means the Eastern New Mexico Rural Water System, a water delivery project designed to deliver approximately 16,500 acre-feet of water per year from the Ute Reservoir to the cities of Clovis, Elida, Grady, Melrose, Portales, and Texico and other locations in Curry, Roosevelt, and Quay Counties in the State.

(B) INCLUSIONS.—The term "System" includes the major components and associated infrastructure identified as the "Best Technical Alternative" in the engineering report.

(7) UTE RESERVOIR.—The term "Ute Reservoir" means the impoundment of water created in 1962 by the construction of the Ute Dam on the Canadian River, located approximately 32 miles upstream of the border between New Mexico and Texas.

(b) EASTERN NEW MEXICO RURAL WATER SYSTEM.—

(1) FINANCIAL ASSISTANCE.—

(A) IN GENERAL.—The Secretary may provide financial and technical assistance to the Authority to assist in planning, designing, conducting related preconstruction activities for, and constructing the System.

(B) USE.—

(i) IN GENERAL.—Any financial assistance provided under subparagraph (A) shall be obligated and expended only in accordance with a cooperative agreement entered into under subsection (d)(1)(B).

(ii) LIMITATIONS.—Financial assistance provided under clause (i) shall not be used—

(I) for any activity that is inconsistent with constructing the System; or

(II) to plan or construct facilities used to supply irrigation water for irrigated agricultural purposes.

(2) COST-SHARING REQUIREMENT.—

(A) IN GENERAL.—The Federal share of the total cost of any activity or construction carried out using amounts made available under this section shall be not more than 75 percent of the total cost of the System.

(B) SYSTEM DEVELOPMENT COSTS.—For purposes of subparagraph (A), the total cost of the System shall include any costs incurred by the Authority or the State on or after October 1, 2003, for the development of the System.

(3) LIMITATION.—No amounts made available under this section may be used for the construction of the System until—

(A) a plan is developed under subsection (c)(2); and

(B) the Secretary and the Authority have complied with any requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) applicable to the System.

(4) TITLE TO PROJECT WORKS.—Title to the infrastructure of the System shall be held by the Authority or as may otherwise be specified under State law.

(c) OPERATION, MAINTENANCE, AND REPLACEMENT COSTS.—

(1) IN GENERAL.—The Authority shall be responsible for the annual operation, maintenance, and replacement costs associated with the System.

(2) OPERATION, MAINTENANCE, AND REPLACEMENT PLAN.—The Authority, in consultation with the Secretary, shall develop an operation, maintenance, and replacement plan that establishes the rates and fees for beneficiaries of the System in the amount necessary to ensure that the System is properly maintained and capable of delivering approximately 16,500 acre-feet of water per year.

(d) ADMINISTRATIVE PROVISIONS.—

(1) COOPERATIVE AGREEMENTS.—

(A) IN GENERAL.—The Secretary may enter into any contract, grant, cooperative agreement, or other agreement that is necessary to carry out this section.

(B) COOPERATIVE AGREEMENT FOR PROVISION OF FINANCIAL ASSISTANCE.—

(i) IN GENERAL.—The Secretary shall enter into a cooperative agreement with the Authority to provide financial assistance and any other assistance requested by the Authority for planning, design, related preconstruction activities, and construction of the System.

(ii) REQUIREMENTS.—The cooperative agreement entered into under clause (i) shall, at a minimum, specify the responsibilities of the Secretary and the Authority with respect to—

(I) ensuring that the cost-share requirements established by subsection (b)(2) are met;

(II) completing the planning and final design of the System;

(III) any environmental and cultural resource compliance activities required for the System; and

(IV) the construction of the System.

(2) TECHNICAL ASSISTANCE.—At the request of the Authority, the Secretary may provide to the Authority any technical assistance that is necessary to assist the Authority in planning, designing, constructing, and operating the System.

Consultation.

(3) BIOLOGICAL ASSESSMENT.—The Secretary shall consult with the New Mexico Interstate Stream Commission and the Authority in preparing any biological assessment under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) that may be required for planning and constructing the System.

(4) EFFECT.—Nothing in this section—

(A) affects or preempts—

(i) State water law; or

(ii) an interstate compact relating to the allocation of water; or

(B) confers on any non-Federal entity the ability to exercise any Federal rights to—

(i) the water of a stream; or

(ii) any groundwater resource.

(e) AUTHORIZATION OF APPROPRIATIONS.—

(1) IN GENERAL.—In accordance with the adjustment carried out under paragraph (2), there is authorized to be appropriated to the Secretary to carry out this section an amount not greater than $327,000,000.

(2) ADJUSTMENT.—The amount made available under paragraph (1) shall be adjusted to reflect changes in construction costs occurring after January 1, 2007, as indicated by engineering cost indices applicable to the types of construction necessary to carry out this section.

(3) NONREIMBURSABLE AMOUNTS.—Amounts made available to the Authority in accordance with the cost-sharing requirement under subsection (b)(2) shall be nonreimbursable and nonreturnable to the United States.

(4) AVAILABILITY OF FUNDS.—At the end of each fiscal year, any unexpended funds appropriated pursuant to this section shall be retained for use in future fiscal years consistent with this section.

SEC. 9104. RANCHO CALIFORNIA WATER DISTRICT PROJECT, CALIFORNIA.

(a) IN GENERAL.—The Reclamation Wastewater and Groundwater Study and Facilities Act (Public Law 102–575, title XVI; 43 U.S.C. 390h et seq.) is amended by adding at the end the following:

"SEC. 1649. RANCHO CALIFORNIA WATER DISTRICT PROJECT, CALIFORNIA. 43 USC 390h–32.

"(a) AUTHORIZATION.—The Secretary, in cooperation with the Rancho California Water District, California, may participate in the design, planning, and construction of permanent facilities for water recycling, demineralization, and desalination, and distribution of non-potable water supplies in Southern Riverside County, California.

"(b) COST SHARING.—The Federal share of the cost of the project described in subsection (a) shall not exceed 25 percent of the total cost of the project or $20,000,000, whichever is less.

"(c) LIMITATION.—Funds provided by the Secretary under this section shall not be used for operation or maintenance of the project described in subsection (a).".

(b) CLERICAL AMENDMENT.—The table of items in section 2 of Public Law 102–575 is amended by inserting after the last item the following:

"Sec. 1649. Rancho California Water District Project, California.".

SEC. 9105. JACKSON GULCH REHABILITATION PROJECT, COLORADO.

(a) DEFINITIONS.—In this section:

(1) ASSESSMENT.—The term "assessment" means the engineering document that is—

(A) entitled "Jackson Gulch Inlet Canal Project, Jackson Gulch Outlet Canal Project, Jackson Gulch Operations Facilities Project: Condition Assessment and Recommendations for Rehabilitation";

(B) dated February 2004; and

(C) on file with the Bureau of Reclamation.

(2) DISTRICT.—The term "District" means the Mancos Water Conservancy District established under the Water Conservancy Act (Colo. Rev. Stat. 37–45–101 et seq.).

(3) PROJECT.—The term "Project" means the Jackson Gulch rehabilitation project, a program for the rehabilitation of the Jackson Gulch Canal system and other infrastructure in the State, as described in the assessment.

(4) SECRETARY.—The term "Secretary" means the Secretary of the Interior, acting through the Commissioner of Reclamation.

(5) STATE.—The term "State" means the State of Colorado.

(b) AUTHORIZATION OF JACKSON GULCH REHABILITATION PROJECT.—

(1) IN GENERAL.—Subject to the reimbursement requirement described in paragraph (3), the Secretary shall pay the Federal share of the total cost of carrying out the Project. Payments.