Volume I:

Preface, Section 1, and Section 2

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El Paso Final Environmental Impact Statement

Volume I

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Preface

This document contains the Final Environmental Impact Statement (Final EIS or FEIS) for the El Paso–Las Cruces Regional Sustainable Water Project.

This Final EIS is an abbreviated final EIS. An abbreviated final EIS is one where the DEIS is not reprinted in its entirety. This Final EIS is in two volumes, and contains only the following sections:

1. Revisions and Clarifications
2. Appendices
3. Public Comments and Responses

Volume I includes the *Revisions and Clarifications* section, and the *Appendices*. The *Revisions and Clarifications* section contains revisions to DEIS text that were specifically prepared in response to public comments, for necessary clarifications, or to correct errors brought to our attention during the DEIS public review period.

This document also contains five appendices, which are included in this Final EIS in response to comments received for the DEIS. Appendix F is a copy of *the Sale of Water for Miscellaneous Purposes Act* of 1920. Appendix G contains a petition to the Natural Resources Conservation Service (NRCS) regarding prime farmlands in Texas, and a copy of the NRCS response to the petition. Appendix H is the U.S. Fish and Wildlife Service (FWS) *Draft Fish and Wildlife Coordination Act Report*. Appendix I is the agency response to the FWS recommendations from the *Draft Fish and Wildlife Coordination Act Report*. Appendix J contains legal agreements involving the Ysleta Del Sur Pueblo.

Volume II of this Final EIS contains the *Public Comments and Responses* section, which includes all of the letters and email received regarding the DEIS, along with responses to each comment. The letters and email received were divided among 10 categories, as follows:

A Elected Officials
B Federal Agencies
C State Agencies
D Local Agencies
E Tribes
F Non-Government Agencies
G Private Institutions
H Interested Individuals
I Public Meeting Comments
J International Coordination

The *Public Comments and Responses* are contained in a separate volume to make cross-referencing with the *Revisions and Clarifications* and *Appendices* easier for the reader.

This Final EIS must be read in conjunction with the DEIS for the El Paso–Las Cruces Regional Sustainable Water Project. The DEIS is available from an earlier distribution in book and electronic format. To obtain a copy, please contact either Mr. Douglas Echlin (his address follows) or your city, county, or state government officials; or visit your local library. Except as modified by the *Revisions and Clarifications* section, all of the material contained and printed in the DEIS is correct and remains in effect.

Copies of the Final EIS are available in book and electronic format. The Final EIS, Draft EIS, and Technical Reports are also available online at the U.S. Section, International Boundary and Water Commission (USIBWC) website: www.ibwc.state.gov/index.htm. Requests for a copy of the Final EIS should be made to:

Mr. Douglas Echlin
Environmental Protection Specialist
Environmental Management Division
USIBWC
4171 N. Mesa Street, C-310
El Paso, TX 79902

Section 1

Revisions and Clarifications

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Comment B3-9

ES.2.3.5 Water Acquisition, Page ES-5

Comment B2-9

Transferring water from agricultural to municipal use, through conversion of Rio Grande Project water uses, is an integral part of successfully implementing the El Paso–Las Cruces Regional Sustainable Water Project. Conversion of some water use is allowed under the project as long as the converter (water utility or similar entity) has the agreement of the landowner and either the Elephant Butte Irrigation District (EBID) in New Mexico or the El Paso County Water Improvement District No. 1 (EPCWID No. 1) in Texas, as well as the approval of the USBR, who is responsible for the administration of Rio Grande Project water. The Act of February 25, 1920 (Sale of Water for Miscellaneous Purposes) authorizes the Secretary of the Interior to enter into contracts for the conversion of some project water to uses other than irrigation, so long as the applicable water user organization approves the contract; no other practicable source of water is available; and the terms of the contract are not detrimental to water service for irrigation. Table 2.2-5 in Chapter 2 summarizes potential water right~~’s~~s’ conversions under the Preferred Alternative.

ES.2.3.8 Rio Grande Flows, Page ES-6

Comment B2-10

Project feature development with the Preferred Alternative would affect the amount and timing of flows, and potentially the riverine ecosystem in reaches of the Rio

Grande from Elephant Butte Reservoir downstream to Fort Quitman. Project area functions that would affect the flow regime include the following:

- Project operation in compliance with the terms of the Rio Grande Compact
- Water delivery requirements and projected demands during the irrigation and non-irrigation seasons
- Seasonal fluctuation in return-flow volumes
- International treaty requirements for river water delivery to Mexico
- River diversions necessary to meet present and future municipal and industrial water demands in the El Paso–Las Cruces region
- Naturally occurring annual variation in the flow regime depending on wet-, average-, or dry-year hydrologic conditions

ES.2.3.9 USBR Water Contract Administration, Page ES-7

Comment B2-11

- Agreement on water supply for land beyond the 2,000 acres of EPWU/PSB-owned land covered in the 1941 and 1962 contracts (see page 2-89 for more details)
- Agreement on the amount of water comprising an equitable allocation for the City of El Paso (3.5 vs. 4.0 acre-feet per acre [ac-ft/ac]) (see page 2-89 for more details)

ES.3.3.5 Wildlife Resources

There would be permanent and temporary adverse impacts on wildlife resources, including birds, mammals, and herptiles (amphibians and reptiles), as well as project benefits from the Preferred Alternative and the other action alternatives. ~~However, only one~~ Several of these impacts would have significant adverse effects, and theyit would ~~only~~ occur under three~~the River with Year-Round Lower Plants~~ a~~A~~lternatives. Increased river flows during the secondary irrigation season ~~under this alternative~~ would result in the loss (inundation) of more than 500 acres of exposed river bottom, such as sandbars, shoreline, and islands, as well as~~and~~ shallow feeding habitat from November through February with the River with Year-Round Lower Plants Alternative, and during January with the two Aqueduct Alternatives. These losses would have significant adverse impacts on aquatic herptile communities in the Rio Grande that use exposed surfaces for basking and hibernation, and on wintering shorebirds and some waterfowl because of reduced feeding and roosting habitat. No mitigation is proposed for these ~~is~~ significant impacts because ~~since~~ there would be concurrent minor benefits to some other waterfowl and fish because of increased flows and water depths during the secondary irrigation season. Inundation of exposed bottom areas and shallow feeding habitat in the Rio Grande would be less extensive under the other action alternatives, and would not result in significant adverse impacts on wildlife resources. ~~Exposed bottom areas and shallow feeding areas would actually increase under the Preferred Alternative and benefit aquatic harptiles, wintering shorebirds, and some waterfowl.~~

ES.3.4 Comparison of Alternatives

Table ES.3.4-1 compares potential impacts among the Preferred Alternative and the four other action alternatives for each resource area. Potential impacts are noted in the table as being significant, notable but not significant, or not significant or notable. In many instances, there are either no or only minimal differences among the alternatives; and for most resources, impacts would not be expected to reach a level of significance. There would, however, be significant adverse impacts from each of the action alternatives on the following resources:

- Water resources (TDS exceedances) (see Section ES.3.3.1)
- Land use (conversion of Farmland of Statewide Importance in Doña Ana County) (see Section ES.3.3.2)
- Environmental justice (loss of farmworker jobs held by minority or low-income populations) (see Section ES.3.3.11)
- Socioeconomics (reduced agricultural production, revenue, and employment) (see Section ES.3.3.12)

The magnitude and extent of these impacts would be slightly greater under the River with Year-Round Lower Plants Alternative, primarily because of the direct and indirect effects of potentially retiring more irrigated farmland under this than the other alternatives. River flows under this particular alternative would be slightly more beneficial to aquatic resources than the other alternatives because of greater flow increases extending farther downstream during the non-irrigation season, and because of greater flow reductions during the typically high-flow irrigation season. However, this minor benefit to fish would potentially be offset by adverse effects on herptiles, some shorebirds, and waterfowl from inundating a significant portion of exposed river bottom and shallow feeding areas for four months during winter. For this reason, the River with Year-Round Lower Plants Alternative also would have a significant adverse impact on wildlife resources.

TABLE ES.3.4-1
Environmental Impact Summary for the Preferred Alternative and Other Action Alternatives

	Preferred Alternative–River with Local Plants	River with Year-Round Lower Plants Alternative	River with Combined Plant Alternative	Aqueduct with Local Plants Alternative	Aqueduct with Combined Plant Alternative
Water Resources	S	S	S	S	S
Land Use	S	S	S	S	S
Aquatic Resources	N	N	N	N	N

TABLE ES.3.4-1
Environmental Impact Summary for the Preferred Alternative and Other Action Alternatives

	Preferred Alternative–River with Local Plants	River with Year-Round Lower Plants Alternative	River with Combined Plant Alternative	Aqueduct with Local Plants Alternative	Aqueduct with Combined Plant Alternative
Vegetation Resources	N	N	N	N	N
Wildlife Resources	N	S	N	~~N~~S	~~N~~S
Threatened and Endangered Species	NS	NS	NS	NS	NS
Recreation Resources	NS	NS	NS	NS	NS
Cultural Resources	NS	NS	NS	NS	NS
Transportation and Circulation	N	N	N	N	N
Mineral and Energy Resources	NS	N	NS	N	N
Environmental Justice	S	S	S	S	S
Socioeconomics	S	S	S	S	S
Air Quality	NS	NS	NS	NS	NS
Noise	N	N	N	N	N
Health and Safety	NS	NS	NS	NS	NS
Indian Trust Assets	NS	NS	NS	NS	NS

S=Significant Impacts
N=Notable but Not Significant Impacts
NS=No Significant or Notable Impacts

1.2.2 Need and Background

Comment D3-13

The seven-member Commission was created in 1991 as a part of the Settlement Agreement from a lawsuit in which El Paso sought permits to pump New Mexico ground water for use in Texas. The Commission was created in an attempt to address some of the challenges described above, and in response to concerns regarding water supply in the rapidly growing El Paso–Las Cruces region. Previous attempts by others to resolve the increasingly acute water supply shortage, water quality, and river habitat issues had been unsuccessful. With representatives from local water districts, municipalities, government agencies, and universities, the Commission provides a forum to plan for the future development and use of water resources in the El Paso–Las Cruces region. The Commission consists of four New Mexico representatives and ~~three~~ two Texas representatives, as follows:

- New Mexico
  - City of Las Cruces
  - Doña Ana County
  - Elephant Butte Irrigation District
  - New Mexico State University
- Texas
  - ~~El Paso County Water Improvement District No. 1 (EPCWID No. 1)~~
  - EPWU/PSB
  - University of Texas at El Paso

1.4 Authorizing Actions, Permits, and Licenses, Table 1.4-1, Pages 1-7 through 1-12

Comment C3-1

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
Federal Agencies		
U.S. Section, International Boundary and Water Commission, United States and Mexico (USIBWC)	National Environmental Policy Act (NEPA) compliance	USIBWC is the lead agency and is jointly responsible for ensuring compliance with NEPA and other environmental statutes, overall coordination of the environmental review, approving the alternative selected for construction, and signing the Record of Decision (ROD).
	Upholding provisions of the 1906 Convention and 1907 Treaty between the United States and Mexico	USIBWC is the designated federal agency responsible for meeting the United States' obligation under the convention to annually deliver 60,000 acre-feet of water to Mexico. USIBWC must ensure that those deliveries would continue, unaffected by the project.
	Licenses for Rio Grande crossings and other USIBWC-related issues	USIBWC reviews applications and issues licenses for pipeline crossings of the river, alteration of the river channel, changes in water delivery to Mexico, and changes to USIBWC facilities resulting from the construction, operation, and maintenance of project features.
	Archaeological Resources Protection Act (ARPA) Permit	USIBWC issues an ARPA Permit for ground disturbances on Federal land it administers.

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
U.S. Fish and Wildlife Service (FWS)	Endangered Species Act (ESA) (Section 7 consultation)	Consultation under Section 7 of ESA is required to determine if the project will affect threatened or endangered species. FWS will prepare a Biological Opinion based on the lead and joint agencies' Biological Assessment.
	Fish and Wildlife Coordination Act (FWCA) Report	FWS must prepare a FWCA Report that determines impacts on fish and wildlife and recommends ways to avoid or mitigate those impacts.
U.S. Army Corps of Engineers (COE)	Permit pursuant to Section 404 of the Clean Water Act (CWA)	COE will potentially issue a CWA 404 Permit, which will be required for excavation or discharge of fill material into waters of the U.S., including wetlands.
	Section 401 Water Quality Certificate of the CWA	COE coordinates the water quality certification process with the states of New Mexico and Texas for applicable project features.
	Nationwide Permits for Utility Line Crossing (COE Permit 12)	COE will potentially issue a permit, which will be required for arroyos crossed by project utility lines.
	Wetland mitigation plan, if needed, for impacts on nonagricultural lands	COE must approve the delineation, impact analysis, and preparation of wetland mitigation plan for jurisdictional wetlands impacted by the project on nonagricultural lands for the CWA 404 permit.
Natural Resources Conservation Service (NRCS)	Wetlands delineation on agricultural lands	NRCS will delineate wetlands on agricultural lands, if needed, under the Food Security Act (FSA).
U.S. Environmental Protection Agency (EPA)	Oversight authority for Section 404 Permits	EPA will review 404 permit applications and recommend approval or denial of permits. EPA has authority to veto COE permit approvals.
	Section 402 National Pollutant Discharge Elimination System (NPDES) Permit	EPA jointly issues or coordinates with the States of New Mexico and Texas in issuing NPDES Permits, as required, for applicable project features in New Mexico and Texas.

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
U.S. Bureau of Reclamation (USBR)	Approve water use conversion and enter into and administer third-party water contracts	USBR must approve project-related changes in operating procedures for the delivery of water and the conversion of water from agricultural use to municipal and industrial (M&I) use. USBR will enter into contracts with Elephant Butte Irrigation District (EBID) and/or El Paso County Water Improvement District No. 1 (EPCWID No. 1) and the project sponsor for the proposed projects. They also will enter into contracts with El Paso Water Utilities/Public Service Board (EPWU/PSB) and EPCWID No. 1 for other specific, related facilities or actions involving water supply, savings, exchange, and use.
U.S. Bureau of Land Management (BLM)	Right-of-ways (ROWs) for use of lands and an Archaeological Resources Protection Act (ARPA) Permit for disturbing grounds administered by BLM	BLM will potentially issue a ROW and ARPA Permit for the Anthony Gap waterline crossing through the Organ Mountains' Area of Critical Environmental Concern (ACEC).
U.S. Department of the Army	Consultation with Fort Bliss regarding archeological resources and threatened and endangered species	Construction on lands administered by Fort Bliss and Biggs Army Airfield will require compliance with the National Historic Preservation Act of 1966, as amended, and the Endangered Species Act of 1973, as amended.
State Agencies		
New Mexico Department of Game and Fish (NMDGF) and Texas Parks and Wildlife Department (TPWD)	Managing and consulting on fish and wildlife in New Mexico and Texas with concurrent responsibility for the FWS FWCA Report.	The Departments will comment on the FWCA Report. If they can not concur with FWS, they may prepare their own FWCA Report(s).
New Mexico Historic Preservation Division, State Historic Preservation Officer (SHPO) and Texas Historical Commission, SHPO	New Mexico and Texas Antiquities Permits Signatories to a Programmatic Agreement, if needed, with project sponsors and the Advisory Council on Historic Preservation (ACHP) to guide future studies and mitigation.	Approval of survey and recovery of cultural resources in New Mexico and Texas prior to project construction. The SHPOs and ACHP will determine if the proposed project will have an impact on culturally or historically sensitive sites listed in New Mexico and Texas, or if sites are eligible for listing on the National Register of Historic Places.

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
New Mexico Environment Department (NMED) for project features in New Mexico and Texas Natural Resource Conservation Commission (TNRCC) for project features in Texas	Section 401 Water Quality Certificate (CWA)	These agencies, working with the COE, issue Water Quality Certificates for applicable project features in New Mexico and Texas.
	Section 402 National Pollutant Discharge Elimination System (NPDES) Permit	These agencies issue or coordinate with EPA in issuing NPDES Permits, as required, for applicable project features in New Mexico and Texas.
	Section 404 Dredge and Fill Permit (CWA)	These agencies coordinate with the COE, the federal agency responsible for issuing Section 404 Permits.
	Stream Alternation Permit	These agencies issue permits for project features affecting the river bed in New Mexico and Texas.
	WTP License	These agencies issue licenses for the construction and operation of WTPs.
	Texas Air Quality Permit	TNRCC issues an Air Quality Permit for emissions associated with water pumping as part of the aquifer storage and recovery (ASR) program.
New Mexico Department of Transportation (NMDOT) and Texas Department of Transportation (TDOT)	Encroachment Permits	NMDOT and TDOT must issue permits to construct or modify project features in state highway ROWs in New Mexico and Texas.

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
Other Agencies and Organizations		
El Paso Water Utilities/Public Service Board (EPWU/PSB)	Joint lead agency Makes decision to construct and requests funds for project and construction and acquisition of project lands and water, as required, for its facilities in Texas on behalf of the City of El Paso. Enters into agreements to construct and operate project features in Texas.	EPWU/PSB is the joint lead agency responsible with USIBWC for ensuring compliance with NEPA and other environmental statutes, overall coordination of the environmental review, approving the alternative selected for construction, and signing the Record of Decision (ROD). EPWU/PSB will enter into the necessary agreements and contracts associated with project construction, operation, and maintenance. EPWU/PSB must enter into agreements with various entities, such as water management agencies and communities, where project features would be constructed that describe the terms of operation and maintenance for those features.
	Well Drilling Permit	EPWU/PSB reviews applications and issues permits for drilling wells (for example, the ASR program) in the Utility's service area in the City.
Governments of Las Cruces, Hatch, and Doña Ana County (or Anthony Water and Sanitation District)	Make decision to construct and request funds for project construction and acquisition of project lands and water, as required, for their facilities in New Mexico on behalf of their respective communities. Enter into agreements with various entities to construct and operate project features in New Mexico.	These entities will enter into the necessary agreements and contracts associated with project construction, operation, and maintenance. These entities must enter into agreements with various other entities, such as water management agencies, where project features would be constructed that describe the terms of operation and maintenance for those features.
Elephant Butte Irrigation District (EBID), New Mexico	Rio Grande Project, New Mexico portion	EBID operates and maintains the New Mexico portion of the project's irrigation division through contract with the USBR. As such, it would be responsible for selling the water to the Governments of Las Cruces, Hatch, and Doña Ana County (or Anthony Water and Sewer District).
	Rights-of-Use Licenses and Permits	EBID reviews applications and issues leases, permits, licenses, and agreements for the occupation, use, or traversing of lands under

TABLE 1.4-1
Authorizing Actions, Permits, and Licenses

Agency or Organization	Actions, Permits, and Licenses Required	Description
		the ownership, administration, or management of EBID. Examples are dewatering and utility crossing permits.
El Paso County Water Improvement District No. 1 (EPCWID No. 1), Texas	Rio Grande Project, Texas portion	EPCWID No. 1 operates and maintains the Texas portion of the project's irrigation division through contract with the USBR. As such, it would be responsible for selling the water to EPWU/PSB.
	Right-to-Use Licenses	EPCWID No. 1 reviews applications and issues licenses for the purchase, exchange, easement, lease, or other right-to-use EPCWID No. 1 real property. Examples are dewatering and utility crossing permits.
Doña Ana County Government, New Mexico and El Paso County Government, Texas	ROW and Miscellaneous Permits	Doña Ana and El Paso Counties will need to issue permits for project features in New Mexico and Texas and, as needed, including permits to construct in County road ROWs.
Rio Grande Compact Commission	This agency is responsible for the administration of the Rio Grande Compact.	The Commission oversees the Compact, which controls allocation of Rio Grande Project Waters among the states of Colorado, New Mexico, and Texas.
Governments of Las Cruces, Hatch, Salem, Garfield, Rincón, Doña Ana, Radium Springs, San Miguel, Mesquite, Anthony, Vado, Berino, Chamberino, La Mesa, and La Union, New Mexico and Government of El Paso, Texas	Miscellaneous permits and approvals	Communities may require permits or approvals for activities affecting local roads, drainage structures, and utilities.

1.5.2 Future Interrelated Projects, Table 1.5-1, Pages 1-15 and 1-16

Comment C6-3

TABLE 1.5-1
Projects Considered for Cumulative Impact Analysis

Project Name	Description	Included in Cumulative Impact Analysis?	Reason Excluded
Far West Texas Regional Water Plan	50-year water resource plan required by Senate Bill 1	No	Not a project; just a plan.
Riverside Canal Lining	EPCWID No. 1 ongoing program to conserve water	Yes	
Riverside Diversion Dam	Potential removal of this facility	No	Not sufficiently defined.
Jonathan Rogers WTP Expansion (from 40 to 60 mgd)	Current increase in plant capacity	No	Will be completed well before the project. It will be assumed to be in the existing water management system.
Rio Grande Project (Operating Plan)	Legal action related to an operating plan for the Rio Grande Project	No	Not sufficiently defined.
Juárez, Mexico Sustainability Project	Water master plan for Cd. Juárez	Yes	
Santa Teresa Anapra Economic Development Plan	Development associated with Santa Teresa Port of Entry	No	Not sufficiently defined.
USIBWC Canalization and Rectification Projects	Updating management plans and NEPA compliance for USIBWC's Canalization and Rectification Projects	Yes	
Canutillo Flood Control	COE arroyo flood routing study	No	Not sufficiently defined.
Annexation of East and West El Paso	Potential annexation of new lands into El Paso	No	Not sufficiently defined and not of a magnitude to result in substantive cumulative impact.
NAFTA Restrictions Terminated	NAFTA tariffs phase out	No	Not relevant to the project.
White Sands	Various developments at White Sands Missile Range	No	Not the same area of influence.

TABLE 1.5-1
Projects Considered for Cumulative Impact Analysis

Project Name	Description	Included in Cumulative Impact Analysis?	Reason Excluded
Southwest Regional Spaceport	Potential development of a commercial spaceport ~~at~~ near White Sands Missile Range using the Hatch WTP and/or Rincón groundwater system as water sources	Yes	
Upper Valley Wastewater Treatment Plant	Development of a 10-mgd wastewater treatment plant by EPWU	Yes	
Desalination Plants	Potential desalination plants to treat saline waters pumped from the Hueco Bolson	Yes	
Intermodal Transportation Project in El Paso	A plan to develop a transportation hub in NE El Paso including air, trucks, and rail modes	No	Not relevant to the Sustainable Project.
Rail Switchyard Relocation	Potential move of the Union Pacific rail yards to SW El Paso	No	Not relevant to the Sustainable Project.
Silvery Minnow Critical Habitat Designation	Proposal to designate sections of the middle Rio Grande as critical habitat, thus changing the flow regimes	No	Not relevant to the Sustainable Project.
Albuquerque Water Resource Program (SJ-C)	A program to switch Albuquerque use of ground water to surface water, including their San Juan–Chama rights	No	Not within the Sustainable Project area of influence.
USIBWC Boulder Clusters	A program by USIBWC to mitigate for dredging of the Rio Grande where arroyos deposit material from floods	No	Not of sufficient magnitude to result in a substantive cumulative impact.
Bustamante Expansion	An expansion of EPWU's Bustamante Wastewater Treatment Plant	No	Will be completed well before the Sustainable Project. It will be assumed to be in the existing water management system.
Canutillo Well Field Master Plan	A plan for the future development of the Canutillo Well Field	No	Not of sufficient magnitude to result in a substantive cumulative impact.

2.1.1.1 Water Treatment Plants and Associated Facilities, Page 2-1

Comments B2-29, B3-11, D3-7, F6-6, and F13-3

Treatment of raw surface water at new, expanded, and existing water treatment plants would provide an additional supply of drinking water to meet current municipal needs in the El Paso–Las Cruces region. Water treatment plants (WTPs) would help prevent critical drinking water shortages in the future, as well as permanent impacts on aquifers caused by excessive pumping of ground water.

2.1.1.1.1 Drain-Blending Strategy

To minimize changes in water quality (Total Dissolved Solids [TDS]) at American Dam, a drain-blending strategy will be implemented at the Upper Valley Water Treatment Plant (WTP). This strategy consists of a pump station and pipeline/siphon that will collect drain water from the East Drain and deliver it to the Upper Valley WTP. The drain water will be blended with Rio Grande supply water for treatment at the Upper Valley WTP.

2.2.2.1.4.1 Description of Facilities, Page 2-39

Comments B2-29, B3-11, D3-7, F6-6, and F13-3

Table 2.1-5 lists the primary design and operational characteristics of the proposed Upper Valley WTP and associated facilities. They would be located on a 233-acre site bordered by Vinton Road on the west, the Rio Grande levee on the east, and private property on the north and south (Figure 2.2-12). The site consists of two separately-owned parcels of land. EPWU owns “Parcel IV” (161 acres) and is negotiating for the purchase of the “New Land” parcel (72 acres).

With the Preferred Alternative, the Upper Valley WTP would have a treatment capacity of 80 mgd during Phases 1, 2, and 3 (years 2005 through 2030). No additional capacity would be added in Phases 2 or 3 beyond the 80 mgd initially developed in Phase 1. Raw water to be treated would be diverted from the west side of the Rio Grande at the proposed Upper Valley Diversion structure. This diversion would be immediately east of the WTP site. Its design is discussed in Section 2.2.2.2. Diverted water would be conveyed by a series of 42-inch-diameter pipelines about 500 feet west to the WTP raw water pump station.

One of the elements of the Preferred Alternative involves constructing the Upper Valley WTP with a capacity of 80 mgd near Anthony, Texas. The Preferred Alternative proposes that the Upper Valley WTP be supplied with raw water deliveries from a Rio Grande diversion adjacent to the plant site. According to the Boyle Engineering Stream Simulation Model (BESTSM) prepared for the project, this diversion will result in a lower water quality at the American Dam downstream of the Upper Valley WTP diversion. In order to mitigate this water quality change, drain flows in the vicinity of the Upper Valley WTP will be substituted for a portion of the river diversion to the Upper Valley WTP.

Water from the East Drain near the Upper Valley WTP site will be blended with the Rio Grande deliveries to the extent that the water produced by the Upper Valley WTP can meet the required parameters of 910 mg/L of TDS.

The East Drain flows are discharged to the Rio Grande just downstream of the proposed Upper Valley WTP site. This feature requires that a pump station be constructed at the point where the East Drain discharges to the Rio Grande as shown in Figure 2.2-A. This pump station would discharge to a pipeline/siphon that would cross the river and deliver the required drain flows to the Upper Valley WTP to be blended with the river deliveries to the plant. It is anticipated that the blending ratio of East Drain flow to Rio Grande flow would be adjusted on a daily basis to maintain a blended TDS of 910 mg/L.

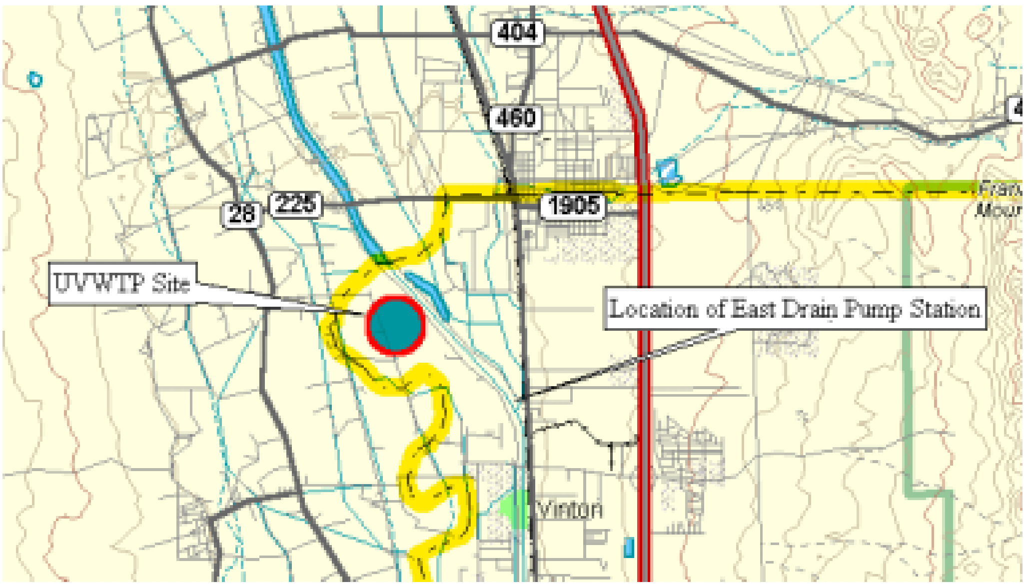

Figure 2.2-A

To determine the effect of the drain-blending strategy, water quality and flow data were obtained from the BESTSM data for both the primary and secondary irrigation seasons in the No Action Alternative and the Preferred Alternative. Simple mass balance calculations were performed to determine what salt load could be removed from the river by diverting some drain flows to the UVWTP. The salt removed from the river was then subtracted from the salt load at the American Dam to determine the effect upon that quality.

Table 2.2-A presents the results of this analysis by comparing the water quality in BESTSM segment Mesilla 4 in the No Action Alternative; the Preferred Alternative without the drain-blending strategy; and the Preferred Alternative with the blending of the East Drain and the Rio Grande.

The TDS effects at American Dam, as shown in Table 2.2-A, are summarized as follows:

Alternative	Primary Season	Secondary Season
No Action Alternative	752	1218
Preferred Alternative without drain-blending strategy	786	1187
Preferred Alternative without drain-blending strategy	765	1171

As shown, the drain-blending concept will lower the TDS increase from 34 mg/L to 13 mg/L during the primary irrigation season. Drain blending would not be necessary during the secondary irrigation season because the Preferred Alternative is better than the No Action Alternative.

TABLE 2.2-A
Effect of Blending East Drain Flows with Rio Grande to Supply the Upper Valley WTP

	Primary Season	Secondary Season	Reference Table (*)
No Action			
East Drain Water Quality, TDS mg/L	1,580	1,450	3.10
East Drain Flow, cfs	41	14	3.9
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Quality, TDS mg/L	605	1,003	4.4
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Flow, cfs	693	140	4.3
Mesilla 4, Montoya Drain to American Diversion Dam Quality, TDS mg/L	752	1,218	4.4
Mesilla 4, Montoya Drain to American Diversion Dam Flow, cfs	779	230	4.6
Preferred Alternative (without drain-blending strategy)			
East Drain Water Quality, TDS mg/l	1,580	1,450	3.10
East Drain Flow, cfs	41	14	3.9
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Quality, TDS mg/L	603	821	4.4
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Flow, cfs	690	173	4.3
Mesilla 4, Montoya Drain to American Diversion Dam Quality, TDS mg/L	786	1,187	4.4
Mesilla 4, Montoya Drain to American Diversion Dam Flow, cfs	715	193	4.6

TABLE 2.2-A
Effect of Blending East Drain Flows with Rio Grande to Supply the Upper Valley WTP

	Primary Season	Secondary Season	Reference Table (*)
Preferred Alternative (with drain-blending strategy)			
East Drain Water Quality, TDS mg/L	1,580	1,450	3.10
East Drain Flow, cfs	41	14	3.9
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Quality, TDS mg/L	603	821	4.4
Mesilla 2, Anthony WTP Site to Upper Valley WTP Site Flow, cfs	690	173	4.3
Mesilla 4, Montoya Drain to American Diversion Dam Quality, TDS mg/L	765	1,171	See Table 2.2-B
Mesilla 4, Montoya Drain to American Diversion Dam Flow, cfs	715	193	4.6

*Table numbers are from CH2M HILL's *Water Resources Technical Report, March 2000,* for the El Paso-Las Cruces Regional Sustainable Water Project.

TABLE 2.2-B
Preferred Alternative with Drain-Blending Strategy

	Primary Season	Secondary Season
Data from Water Resources Technical Report		
East Drain Quality, TDS mg/L	1,580	1,450
East Drain Flow, cfs	41	14
East Drain, lbs/day TDS	835,790	261,910
Mesilla 2 Reach, Quality TDS mg/L	603	821
Mesilla 2 Reach, Flow cfs	690	173
Mesilla 4, lbs/day TDS	5,368,127	1,832,507
Without Drain Blending		
Maximum Upper Valley WTP Quality, TDS mg/L	603	821
Upper Valley WTP Quality, Flow MGD	80	80
Upper Valley WTP, lbs/day TDS	402,322	547,771
With Drain Blending		
Maximum Upper Valley WTP Quality, TDS mg/L	900	900
Upper Valley WTP Flow, MGD	80	80
Blend to Upper Valley WTP		
Flow from East Drain to Upper Valley WTP, MGD	24.3	9.0
Flow from Mesilla 2 Reach to Upper Valley WTP, MGD	5.7	70.0

TABLE 2.2-B
Preferred Alternative with Drain-Blending Strategy

	Primary Season	Secondary Season
Total Flow to Upper Valley WTP, MGD	80.0	79.0
Blend to Upper Valley WTP Quality, TDS mg/L	900	893
Flow from East Drain to Upper Valley WTP, cfs	37.6	14.0
Flow from Mesilla 2 Reach to Upper Valley WTP, cfs	86.1	108.2
Total Salt Flow to Upper Valley WTP, lbs/day TDS	600,480	588,412
East Drain percent	30 percent	11 percent
Mesilla 2 Reach, percent	70 percent	89 percent
Effect of Drain Blending on Mesilla 4 Reach		
Mesilla 4 Reach, Flow cfs	715	193
Salt Removed by drain blending at Upper Valley WTP, lbs/day TDS	198,158	40,641
Salt Removed by drain blending at Upper Valley WTP, mg/L TDS	21.5	16.3
No Action, Mesilla 4 Reach, Quality TDS mg/L	752	1,218
Preferred Action, Mesilla 4 Reach, Quality TDS mg/L	786	1,187
Preferred Action with drain-blending strategy, Mesilla 4 Reach, Quality TDS mg/L	765	1,171

Raw water would be treated at the WTP using either a membrane filtration process or a conventional filtration process. A decision regarding which process to use would be made during the preliminary design phase based on site-specific characteristics, quality of untreated surface water conveyed to the WTP, drinking water quality standards, and cost. Each treatment process is described in the text that follows.

2.2.2.5 Water Acquisition, Page 2-65

Comment B2-16

Transferring water from agricultural to municipal use, through conversion of Rio Grande Project water rights, is an integral part of successfully implementing the El Paso–Las Cruces Regional Sustainable Water Project. This transition of water use is allowed under the project as long as the converter, such as a water utility, has the agreement of the landowner and agricultural water district, and the approval of the USBR, who is responsible for administration of Rio Grande Project water. The Act of February 25, 1920 (Sale of Water for Miscellaneous Purposes) authorizes the Secretary of the Interior to enter into contracts for the conversion of some project water to uses other than irrigation, so long as the applicable water user organization approves the contract; no other practicable source of water is available; and the terms of the contract are not detrimental to water service for irrigation. Transitioning water from agricultural to municipal use will occur in four distinct ways.

2.2.2.5 Water Acquisition, Page 2-66

Comment B2-17

Because all ~~of the~~ land eligible for irrigation water within the ~~irrigation area of the~~ Rio Grande Project has an associated water right to beneficially use water, each ~~water right~~ conversion of use of that water, whether by purchase or partial or complete forbearance, will affect different portions of agricultural land. Within the spectrum of these water rights lands are a distinct set of uses. These uses can be separated into four basic categories, as follows:

2.2.2.6.1.3 Rio Bosque Wetlands Park, Page 2-76

2.2.2.6.1.3.1 Assure Year-Round Water Supply, Page 2-76

Comment D1-1

The most critical need for the Rio Bosque Wetlands Park is for year-round water supply to maintain the vegetation at the site. Currently, the park receives only winter discharges from the Bustam~~o~~ante Wastewater Treatment Plant. Any wetland benefits are lost during the dry summer months. A potential environmental enhancement project would be to provide year-round delivery of water to the park in sufficient quantities to adequately support the planned wetlands and associated riparian habitat. ~~Water could be discharged to the existing ditch system and recaptured at the end of the system by pumping for reuse within the park. This would require a pump station and a pipe distribution system through the park. It is anticipated that occasional flushing flows would be needed to remove salts that would build up in the soils.~~ Possible approaches for achieving this enhancement include installing a pump station for delivering water that has passed through the park into Riverside Canal for irrigation use; integrating the park's wetlands into the wastewater-treatment process at the Bustamante Plant; or recirculating water within the park using a pump and a pipe distribution system.

2.2.2.6.2 Mitigation, Page 2-79

Based on the above assumptions, two specific mitigation measures would be implemented with the Preferred Alternative. They consist of the following:

1. **Monitor agricultural drains.** Field studies would be conducted to confirm the hydrologic model projection that drains would not dry up. If drains dry up because of project-related actions and result in impacts on fish and wildlife, additional mitigation would probably be necessary.

2. **Transplant sensitive plants.** Approximately 60 clumps of sand prickly pear (a federal species of concern) would be transplanted from the El Paso Aqueduct ROW to a nearby location to avoid impacts from pipeline construction. Biologists would determine the actual numbers of sand prickly pear that would be affected after the pipeline centerline has been flagged. A biologist would then develop a transplant plan and would be present

to ensure the plan is being followed or, if necessary, modified based on biological principles. A biologist would monitor the transplant site weekly during the first month following the transplant, quarterly during the remainder of the first year, and twice during the second year.

Mitigation measures proposed by the FWS in its *Fish and Wildlife Coordination Act Report* are found in Appendix G, *Fish and Wildlife Coordination Act Recommendations*.

2.2.2.9 USBR Water Contract Administration, Page 2-89

Comment B2-18

- Agreement on water supply for land beyond the 2,000 acres of EPWU/PSB-owned land covered in the 1941 and 1962 contracts (see Section 2.2.2.9.2. for more details)
- Agreement on the amount of water comprising an equitable allocation for the City of El Paso (3.5 vs. 4.0 acre-feet per acre [ac-ft/ac]) (see Section 2.2.9.1 for more details)

3.3.2.1 General Description, Page 3-7

Comment B2-20

~~In accordance with the 1924 Warren Act, all Rio Grande Project waste and drainage return water that reaches the lower end of the Rio Grande Project may be diverted by the Hudspeth County Conservation and Reclamation District No. 1 (HCCRD No. 1).~~

The Act of February 21, 1911, (known as the Warren Act) authorizes the Secretary of the Interior to enter into contracts for sale or rental of excess/surplus water from the USBR projects. In 1924, the USBR entered into a Warren Act contract with the Hudspeth County Conservation and Reclamation District (HCCRD), and the contract was amended in 1951 **(please see the attachment to Letter B2 in the *Public Comments and Responses* section of this Final EIS)**. Under the terms of this contract, HCCRD may divert and use any waste and drainage water remaining in the system at the terminus of the Rio Grande Project. However, HCCRD has no guaranteed supply nor any right or claim to the use of Rio Grande Project water, but may use it only if and when it is available. The USBR charges HCCRD ~~No. 1~~ for any water diverted between March 1 and September 30. This water irrigates approximately 18,000 acres through a series of small reservoirs and canals that extend south through the Rio Grande Valley for a distance of 40 miles south of the southernmost boundary of the Rio Grande Project.

3.3.3.3 Sources of Water for Conversion, Page 3-12

Comment B2-21

4. Complete or partial forbearance, where contracts would be developed with individual farmers to lease some or all of their right to use water for a period of time, and this water would be converted to M&I use. Farmers entering this type of contract would either continue farming by changing to lower water use crops, not irrigating some portion of their lands, or not farming at all for a period of time.

3.3.3.3 Sources of Water for Conversion, Table 3.3-1, Pages 3-13 and 3-14

Comments D3-22 and D3-23

TABLE 3.3-1
Water Rights Conversions for the Preferred Alternative, River with Combined Plant Alternative, Aqueduct with Local Plants Alternative, and Aqueduct with Combined Plant Alternative

	TX	**NM**	**TX**	**NM**	**TX**	**NM**	**TX**	**NM**
Water Rights' Conversions	**Phase 1**	**Phase 1**	**Phase 2**	**Phase 2**	**Phase 3**	**Phase 3**	**Total**	**Total**
Year	2010	2010	2020	2020	2030	2030	30 Year	30 Year
WTP Design	100 mgd	27.5 mgd	20 mgd	12 mgd		15 mgd	120 mgd	54.5 mgd
WTP Production[a]	92 mgd	25.3 mgd	18.4 mgd	11 mgd		13.8 mgd	110.4 mgd	50.14 mgd
Supply Required	103,053 ac-ft	28,340 ac-ft	20,611 ac-ft	12,366 ac-ft		15,458 ac-ft	123,664 ac-ft	56,165 ac-ft
Supply Conservation Gain[b]	24,000 ac-ft						24,000 ac-ft	
Partial Forbearance	54,653 ac-ft						54,653 ac-ft	
Partial Forbearance[c]	36,435 ac						36,435 ac	
Complete Forbearance	12,000 ac-ft		10,611 ac-ft				22,611 ac-ft	
Complete Forbearance	3,000 ac		4,244 ac[d]				7,244 ac	
Purchase Land	12,400 ac-ft	28,340 ac-ft	10,000 ac-ft	12,366 ac-ft		15,458 ac-ft	22,400 ac-ft	56,164 ac-ft

TABLE 3.3-1
Water Rights Conversions for the Preferred Alternative, River with Combined Plant Alternative, Aqueduct with Local Plants Alternative, and Aqueduct with Combined Plant Alternative

	TX	NM	TX	NM	TX	NM	TX	NM
Water Rights' Conversions	**Phase 1**	**Phase 1**	**Phase 2**	**Phase 2**	**Phase 3**	**Phase 3**	**Total**	**Total**
Purchase Land Acreage[e]	3,100 ac		4,000 ac[d]				7,100 ac	
Total Land Converted[f] ~~[e]~~	6,100 ac	9,447 ac	8,244 ac[d]	4,122 ac		5,153 ac	14,344 ac	18,722 ac

Assumptions for Table 1:

The total available irrigated land in ~~Texas~~ EPCWID No. 1 is 49,664 ac. For purposes of conversion most of the 8,565 ac of pecan orchards are not included in the calculation. Data is based on the 1998 Irrigated Lands Report–EPCWID No. 1 to USBR.

[a]Production rate of the plant is established as 92 percent of stated capacity. This accounts for needed maintenance and the like.

[b]The Phase 1 Jonathan Rogers WTP expansion will receive all additional waters needed from this source.

[c]Acreage effected is based on acquiring 1.5 ac-ft of water/ ac from land receiving 4 ac-ft/ac allotments.

[d]Purchase and complete forbearance on partially forbeared land at 2.5 ac-ft/ac.

[e]~~Includes lands of more than 2,000 ac already purchased by EPWU/PSB for water rights' acquisition.~~

[f] ~~[e]~~ This is the total acreage that will be converted out of farm production through purchase of farmland and complete forbearance (Texas only) of water rights at 4 ac-ft/ac in ~~Texas~~ EPCWID No. 1 and 3 ac-ft/ac in ~~New Mexico~~EBID.

TABLE 3.3-2
Water Rights Conversions for the River with Year-Round Lower Plants Alternative

	TX	NM	TX	NM	TX	NM	TX	NM
Water Rights' Conversions	**Phase 1**	**Phase 1**	**Phase 2**	**Phase 2**	**Phase 3**	**Phase 3**	**Total**	**Total**
Year	2010	2010	2020	2020	2030	2030	30 Year	30 Year
WTP Design	100 mgd	27.5 mgd	20 mgd	12 mgd		15 mgd	120 mgd	54.5 mgd
WTP Production[a]	92 mgd	25.3 mgd	18.4 mgd	11.04 mgd		13.8 mgd	110.4 mgd	50.14 mgd
Additional Carriage Water[b]	20,000 ac-ft		20,000 ac-ft				40,000 ac-ft	
Supply Required	123,053 ac-ft	28,340 ac-ft	20,611 ac-ft	12,366 ac-ft		15,458 ac-ft	163,664 ac-ft	56,164 ac-ft
Supply Conservation Gain[c]	24,000 ac-ft						24,000 ac-ft	
Partial Forbearance	54,653 ac-ft						54,653 ac-ft	
Partial Forbearance Acreage[d]	36,435 ac						36,435 ac	
Complete Forbearance	12,000 ac-ft		20,611 ac-ft				32,611 ac-ft	
Complete Forbearance acreage	3,000 ac		8,244 ac[e]				11,244 ac	
Purchase Land	22,400 ac-ft	38,340 ac-ft	10,000 ac-ft	22,366 ac-ft		15,458 ac-ft	32,400 ac-ft	76,164[b]

TABLE 3.3-2
Water Rights Conversions for the River with Year-Round Lower Plants Alternative

	TX	NM	TX	NM	TX	NM	TX	NM
Water Rights' Conversions	**Phase 1**	**Phase 1**	**Phase 2**	**Phase 2**	**Phase 3**	**Phase 3**	**Total**	**Total**
Purchase Land Acreage[f]	5,600 ac	12,780 ac	2,500 ac	7,455 ac		5,153 ac	8,100 ac	25,388 ac
Total Land Converted[g]	8,600 ac	12,780 ac	10,744 ac	7,455 ac		5,153 ac	19,344 ac	25,388 ac

Assumptions for Table 2:

The total available irrigated land in ~~Texas~~ EPCWID No. 1 is 49,664 ac. For purposes of conversion, all lands in the EPCWID No. 1 district are included in the calculation. Data is based on the 1998 Irrigated Lands Report–EPCWID No. 1 to USBR.

[a]Production rate of the plant is established as 92 percent of stated capacity. This accounts for needed maintenance and the like.

[b]Instream/quality improvement flows to be used in Texas. Conversion impact to be divided between Texas and New Mexico. This results in a conversion of 143,664 ac-ft in Texas and 76,164 ac-ft in New Mexico, while supply needed is 163,664 ac-ft in Texas and 56,165 ac-ft in New Mexico.

[c]The Phase 1 Jonathan Rogers WTP expansion will receive all additional waters needed from this source.

[d]Acreage effected is based on acquiring 1.5 ac-ft of water/ac from land receiving 4 ac-ft/ac allotments.

[e]Purchase and complete forbearance on partially forbeared land at 2.5 ac-ft/ac.

[f]Includes lands of more than 2,000 ac already purchased by EPWU/PSB for water rights' acquisition.

[g]This is the total acreage that will be converted out of farm production through purchase of farmland and complete forbearance (Texas only) of water rights at 4 ac-ft/ac in ~~Texas~~ EPCWID No. 1 and 3 ac-ft/ac in ~~New Mexico~~EBID.

3.3.5.1.2 River Corridor, Page 3-25

Comment B3-13

The Rio Grande between Elephant Butte and Caballo Reservoirs and below Caballo Reservoir to Percha Diversion Dam has been modified by the construction and operation of Elephant Butte and Caballo Dams. The reach between Elephant Butte Dam and Caballo Reservoir was channelized in the late 1950s and channel maintenance (removal of islands, bars, arroyo plugs, and shags) and bank protection by USBR still occurs annually (USBR 1975). The Rio Grande below Percha Diversion Dam has been heavily modified by a Canalization Project sponsored by the USIBWC. The Canalization Project construction started in 1938 and finished in 1943. The Canalization Project included acquisition of rights-of-way (ROWs) along the river, straightening the river channel, and construction of levees along each side of the river for flood control (USIBWC 1981). The channel and floodway have a capacity ranging from 22,000 cfs in the upper reaches to ~~17,000~~ 12,000 cfs in the lower reaches. The USIBWC operates and maintains the channel, ~~and~~ floodway, and flood protection levees. Maintenance includes dredging sand out of the channel and mowing the floodway to limit the growth of vegetation.

3.3.5.1.7 Wastewater Return Flows, Page 3-35

Comment B2-22

There is one WWTP in Hatch, one in Las Cruces, and four in El Paso (Northwest, Haskell Street, Southeast/Bustamante, and Fred Hervey). The Hatch, Las Cruces, and Northwest WWTPs discharge flow to the Rio Grande or tributaries to the Rio Grande. The Haskell Street and Southeast/Bustamante WWTPs discharge to the canal system to co-mingle with irrigation waters. The Fred Hervey plant is a wastewater reclamation plant that discharges its treated effluent to the El Paso Electric Company's Newman Generating Plant for cooling water, to the Painted Dunes Municipal Golf Course for irrigation, and to the Hueco Bolson for recharging that aquifer. In addition, there are small WWTPs in Anthony, New Mexico, Anthony, Texas, and Sunland Park, Texas.

3.3.5.3.3 Rights to Water, Page 3-51

Comment B2-26

A contract negotiated with the USBR in 1941 allowed the EPWU/PSB to purchase up to 2,000 acres of land for the purpose of diverting rights to user water up to a maximum of 3.5 ac-ft/ac. (Camp, Dresser and McKee, Inc. 1977). This 2,000 acre limit ~~has been eliminated~~ was initiated by later agreement (Fahy 1999).

3.3.6.4.1.1.4 Water Quality in River Reaches, Page 3-63

Comment B2-28

Table 3.3-19 shows projected changes in the average number of TDS and sulfate violations at the WTPs during Phase 1. There are no substantial changes in water quality violations at the Hatch WTP between the No Action Alternative and the Preferred Alternative. At the Las Cruces, Anthony, and Upper Valley WTPs, there are substantial decreases in the number of days that TDS and sulfate water quality criteria would be violated under the Preferred Alternative. At the Canal and Jonathan Rogers WTPs, there is a 7 percent increase in the average number of days that TDS criteria would be violated on an annual basis; sulfate criteria violations would increase by 12 percent under the Preferred Alternative. During the primary irrigation season, exceedances at the Canal and Jonathon Rogers WTPs would increase by 38 percent for TDS and 33 percent for sulfate.

3.3.6.4.1.3.4 Water Quality in River Reaches, Pages 3-108 and 3-109

TABLE 3.3-26
Comparison of Average and Dry Year Average TDS Concentration by River Reach for the Preferred Alternative, Phase 3

	No Action			Alternative			Change[a]		
Reach	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)
Upper 1—Above Elephant Butte Reservoir									
Average	444	410	433	444	410	433	0	0	0
Dry	567	458	531	567	458	531	0	0	0
Upper 3—Elephant Butte Dam to Caballo Reservoir									
Average	420	423	421	424	428	425	4	5	4
Dry	499	469	489	506	482	498	7	13	9
Rincón 1—Caballo Dam to Percha Diversion Dam									
Average	462	496	473	467	495	476	5	-1	3
Dry	567	555	563	581	572	578	14	17	15
Rincón 2—Percha Diversion Dam to Selden Canyon									
Average	495	632	540	498	570	522	3	-62	-19
Dry	599	669	622	612	659	628	13	-10	6
Selden—Through Selden Canyon to Leasburg Diversion Dam									
Average	528	784	613	530	644	568	2	-139	-45
Dry	643	782	690	656	746	686	13	-36	-3
Las Cruces 1—Leasburg Diversion Dam to Las Cruces I-10 WTP Site									
Average	529	782	614	530	654	572	1	-128	-42
Dry	646	719	670	658	757	691	13	38	21

TABLE 3.3-26
Comparison of Average and Dry Year Average TDS Concentration by River Reach for the Preferred Alternative, Phase 3

Reach	No Action			Alternative			Change[a]		
	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)
Las Cruces 2—Las Cruces I-10 WTP Site to Mesilla Diversion Dam									
Average	538	803	626	540	692	591	2	-111	-36
Dry	655	747	686	671	789	710	16	42	25
Mesilla 1—Mesilla Diversion Dam to Anthony WTP Site									
Average	545	809	633	549	720	606	4	-89	-27
Dry	662	838	720	682	811	725	20	-26	5
Mesilla 2—Anthony WTP Site to Upper Valley WTP Site									
Average	~~0~~607	~~0~~990	~~0~~735	~~607~~617	~~990~~845	~~735~~693	~~607~~10	~~990~~ -145	~~735~~ -42
Dry	~~10~~734	~~-146~~1046	~~-42~~823	~~734~~807	~~1,046~~953	~~838~~855	~~724~~73	~~1,192~~ –93	~~880~~ 17
Mesilla 3—Upper Valley WTP Site to Montoya Drain									
Average	6810	~~0~~1,162	~~0~~841	~~681~~718	~~1,162~~1,180	~~841~~872	~~681~~37	~~1,162~~18	~~841~~ 31
Dry	~~37~~887	~~18~~1,273	~~31~~1,015	~~887~~1,096	~~1,273~~1,299	~~1,015~~1,164	~~850~~209	~~1,255~~26	~~985~~ 149
Mesilla 4—Montoya Drain to American Diversion Dam									
Average	~~0~~755	~~0~~1,206	~~0~~905	~~755~~809	~~1,206~~1,172	~~905~~930	~~755~~54	~~1,206~~ –34	~~905~~ 25
Dry	~~54~~1,006	~~-34~~1,289	~~25~~1,100	~~1,006~~1,094	~~1,289~~1,213	~~1,100~~1,133	~~952~~88	~~1,322~~ –76	~~1,076~~ 33
LowerV1—American Diversion Dam to International Diversion Dam									
Average	~~0~~769	~~0~~1,164	~~0~~901	~~769~~832	~~1,164~~1,132	~~901~~932	~~769~~63	~~1,164~~ –32	~~901~~ 31
Dry	~~62~~1,005	~~-32~~1,225	~~31~~1,078	~~1,005~~1,067	~~1,225~~1,167	~~1,078~~1,100	~~943~~62	~~1,258~~ –58	~~1,048~~ 22
LowerV2—International Diversion Dam to Riverside Diversion Dam									
Average	~~0~~774	~~0~~1,164	~~0~~904	~~774~~836	~~1,164~~1,132	~~904~~935	~~774~~62	~~1,164~~ –32	~~904~~ 31
Dry	~~62~~995	~~-32~~1,225	~~31~~1,072	~~995~~1,067	~~1,225~~1,167	~~1,072~~1,100	~~933~~73	~~1,258~~ –58	~~1,041~~ 28

TABLE 3.3-26
Comparison of Average and Dry Year Average TDS Concentration by River Reach for the Preferred Alternative, Phase 3

	No Action			Alternative			Change[a]		
Reach	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)	Primary[b] Average (mg/L)	Secondary[b] Average (mg/L)	Annual Average (mg/L)
LowerV3—Riverside Diversion Dam to Fort Quitman									
Average	~~0~~674	~~0~~1,163	~~0~~837	~~674~~801	~~1,163~~1,132	~~837~~912	~~674~~127	~~1,163~~ –31	~~837~~ 75
Dry	~~128~~1,114	~~-32~~1,225	~~75~~1,188	~~1,114~~1,080	~~1,225~~1,167	~~1,188~~1,109	~~986~~ –34	~~1,256~~ –58	~~1,113~~ -79

[a]Change may occasionally be off by 1 because original numbers for computation are rounded.

[b]Primary irrigation season is from March through October. Secondary irrigation season is from November through February.

3.3.6.4.5 Mitigation, Page 3-75

Comment B4-27

Appendix A, *SOPs*, and Appendix B, *BMPs*, as well as monitoring of agricultural drains, are mitigation measures planned to avoid impacts to water resources.

3.3.7.1.2.4 Water Quality in River Reaches, Page 3-193

TABLE 3.3-56
Comparison of Average Water Quality Violations at WTPs for the No Action Alternative and the Aqueduct with Local or Combined Plant Alternatives, Phase 2

	No Action			Alternative		
Water Treatment Plant	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]
	TDS	**TDS**	**TDS**	**TDS**	**TDS**	**TDS**
Hatch	~~0~~2	0	~~0~~2	2	0	2
Las Cruces	~~0~~1	~~0~~24	~~0~~24	1	0	2
Anthony	~~0~~2	~~0~~73	~~0~~75	0	0	0
Upper Valley	~~0~~2	~~0~~105	~~0~~108	0	0	0
Canal and Jonathan Rogers	~~0~~21	~~0~~112	~~0~~133	28	114	142
	Sulfate	**Sulfate**	**Sulfate**	**Sulfate**	**Sulfate**	**Sulfate**
Hatch	~~0~~3	~~0~~1	~~0~~4	2	0	2
Las Cruces	~~0~~4	~~0~~53	~~0~~57	3	0	3
Anthony	~~0~~5	~~0~~111	~~0~~116	3	1	4

TABLE 3.3-56
Comparison of Average Water Quality Violations at WTPs for the No Action Alternative and the Aqueduct with Local or Combined Plant Alternatives, Phase 2

	No Action			Alternative		
Water Treatment Plant	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]
Upper Valley	~~0~~6	~~0~~112	~~0~~118	3	1	4
Canal and Jonathan Rogers	~~0~~60	~~0~~113	~~0~~173	85	115	200

[a]Primary irrigation season is from March through October. Secondary irrigation season is from November through February.
[b]Annual average is not necessarily the sum of primary and secondary irrigation season violations because numbers are rounded.

3.3.7.1.3.4 Water Quality in River Reaches, Page 3-203

TABLE 3.3-59
Comparison of Average Water Quality Violations at WTPs for the No Action Alternative and the Aqueduct with Local or Combined Plant, Phase 3

	No Action			Alternative		
Water Treatment Plant	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]
	TDS	**TDS**	**TDS**	**TDS**	**TDS**	**TDS**
Hatch	~~0~~2	0	~~0~~2	2	0	2
Las Cruces	~~0~~1	~~0~~24	~~0~~24	1	0	1
Anthony	~~0~~2	~~0~~73	~~0~~75	0	0	0
Upper Valley	~~0~~2	~~0~~105	~~0~~108	0	0	0
Canal and Jonathan Rogers	~~0~~21	~~0~~112	~~0~~133	34	114	148
	Sulfate	**Sulfate**	**Sulfate**	**Sulfate**	**Sulfate**	**Sulfate**
Hatch	~~0~~3	~~0~~1	~~0~~4	2	0	2
Las Cruces	~~0~~4	~~0~~53	~~0~~57	2	0	2
Anthony	~~0~~5	~~0~~111	~~0~~116	2	1	3

TABLE 3.3-59
Comparison of Average Water Quality Violations at WTPs for the No Action Alternative and the Aqueduct with Local or Combined Plant, Phase 3

	No Action			Alternative		
Water Treatment Plant	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]	Primary Irrigation Season[a]	Secondary Irrigation Season[a]	Annual Average[b]
Upper Valley	~~0~~6	~~0~~112	~~0~~118	2	1	3
Canal and Jonathan Rogers	~~0~~60	~~0~~113	~~0~~173	96	114	210

[a]Primary irrigation season is from March through October. Secondary irrigation season is from November through February.

[b]Annual average is not necessarily the sum of primary and secondary irrigation season violations because numbers are rounded.

3.4.1 Introduction, Page 3-205

Comment B4-3

This section describes the project region's existing land uses; existing land uses at each of the proposed WTP sites, the ASR site, and along the proposed aqueducts; and potential project effects on these land uses (see Map 1.3-1). The regulatory agencies having jurisdiction within the project region also are identified, and the applicable goals, objectives, and policies of the agencies that guide future land uses and development trends are summarized.

3.4.3.2 Land Ownership, Page 3-206

Comment D3-27

The majority of land adjacent to the Rio Grande within the project region in New Mexico is privately owned. In addition, land managed by the BLM, USBR, USIBWC, ~~EBID,~~ and the State of New Mexico is found along the river corridor, around Elephant Butte, Caballo, Percha Dam, and Leasburg State Parks, and in other areas more distant from the river corridor.

Most of the land outside of the City of El Paso is in private ownership. Agencies owning land outside the City include the U.S. Army, U.S. Department of the Interior (USDI), and the TPWD.

The Rio Grande is considered a navigable waterway of the United States, and as such, is subject to more stringent regulatory controls with regard to activities in the river channel.

3.4.3.4 Local Agency Planning, Page 3-208

Comment D3-29

Future land use and development is typically guided through plans developed by local agencies, such as counties and cities. In New Mexico, the City of Las Cruces and Doña Ana County have jurisdiction over planning and development in the project region, and those agencies have prepared planning documents that specify goals, objectives, and policies for development. In Texas, the City of El Paso and the City of Socorro have ~~jurisdiction over planning and development in the project region, and they also have~~ prepared planning documents that guide future development. El Paso County does not currently have a planning document, but is expecting to complete a General Plan in mid-2000 (Perez 2000).

3.4.3.4.4 City of Socorro, Page 3-211

Comment B4-14

> The City of Socorro encompasses 11,795 acres (about 18 square miles) of land south of the City of El Paso (Molzen-Corbin & Associates 1988). The City of Socorro is located in Socorro County. The majority of land use in Socorro is agricultural, comprising approximately 60 percent of the land. Table 3.4-4 contains Socorro's 1998 Comprehensive Planning Study goals and objectives applicable to the proposed project.

3.7.4.4.3 Impacts of the No Action Alternative, Page 3-319

Short-term (construction) impacts on vegetation communities that support wildlife would not occur, because no construction activities associated with the project would occur with implementation of the No Action Alternative (see Table 3.6-5). Long-term (operational) impacts could occur with implementation of this alternative.

Monthly water surface elevations in Elephant Butte Reservoir are discussed for vegetation and would generally be similar during all three phases, varying 1 to 2 feet less during Phase 1 than Phase 2, and either the same or 1 foot less during Phase 2 and Phase 3 (see Section 3.6.4.4.3 and Tables 3.6-6, 3.6-8, and 3.6-10). For a detailed discussion of reservoir operational changes see Section 3.6, *Vegetation Resources*. Wildlife use of Elephant Butte Reservoir would not be impacted.

The No Action Alternative would promote non-significant water level variations at Caballo Reservoir during Phases 1, 2, and 3 (see Tables 3.6-7, 3.6-9, and 3.6-11). For a detailed discussion of reservoir operational changes see Section 3.6, *Vegetation Resources*. Impacts on wildlife and their habitat at Caballo Reservoir are expected to be non-significant.

Table 3.7-5a shows estimated acres of exposed bottom area by month and river reach under the No Action Alternative during Phase 1. This habitat is important to herptiles, shorebirds, and some waterfowl. Changes in the amount of this habitat because of flow regime changes are discussed for the Preferred Alternative and other action alternatives.

TABLE 3.7-5A
Monthly Bottom Area Exposed (Acres) for Median Operational Flows* for the No Action Alternative, Phase 1

	Reach											
	R1	**R2**	**SEL**	**LC1**	**M1**	**M2**	**M3**	**M4**	**LV1**	**LV2**	**LV3**	**Total**
Month	**Acres**											
October	2	32	5	16	31	3	6	0	47	329	899	1370
November	43	400	70	144	103	58	75	5	4	26	72	1000
December	43	424	84	178	158	72	91	8	5	36	99	1198
January	40	416	90	182	161	84	120	10	7	49	126	1285
February	4	96	24	66	161	94	130	11	8	56	135	785
March	0	0	0	0	10	0	0	0	41	329	899	1279

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999; CH2M HILL 2000b.

3.7.4.5.1.2 River Corridor, Page 3-320

The Preferred Alternative calls for two river corridor construction activities: 1) the creation of water diversion structures and, 2) associated conveyance pipelines to the WTP features. The diversion and conveyance systems are discussed in Section 3.7.4.5.1.3. Wildlife impacts would not occur.

Operational impacts such as surface water elevation changes would take place within the corridor. The Preferred Alternative could affect floodplain wetland, floodplain scrub grass lands, and riparian scrubland habitat types. A large portion of these habitat types are disturbed by channelization of the Rio Grande and by mowing and recreational use of the Rio Grande floodplain. Rio Grande flows would increase November through February above the Upper Valley WTP and would decrease below (Boyle Engineering 1999a). Sandbars, shorelines, and some islands would be lost seasonally with Phase 1 increased flow levels in the upper reaches~~.~~, as shown ~~subsequently~~ in Table 3.8-15. However, none of the reductions in habitat would have significant adverse effects on herptiles, shorebirds, and waterfowl that use exposed bottom areas and shallow riverine habitat. ~~Because of the season and small amount of flow increase, Phase 1 operations would have beneficial, although very minor, long-term impacts on wildlife in the river corridor.~~ The extended hydroperiod of existing river and wetland habitats would increase forage resources. As a result, marginal wetlands dominated by saltgrass may experience very minor increased species diversity, with the addition of sedges, rushes, barnyard grasses, willows, and cottonwoods. Flow changes would be so small that any changes in wetland communities would be minimal. This vegetation transition could enhance wildlife habitat by offering greater habitat diversity, seasonal increase in water availability to riparian habitats, and increased forage resources.

3.7.4.5.4 Total Wildlife Resources Impacts, Page 3-331

Most of the permanently disturbed terrestrial habitat is agricultural or Chihuahuan Desert scrub (see Table 3.6-5). The remaining habitat is *Distichlis/Cynodon* grassland, disturbed scrubland, or residential/industrial land. As discussed previously, herptile abundance in the project area and in these types of vegetation communities is low. Based on the significance criteria established, non-significant impacts on terrestrial herptile communities would occur in the project area.

~~Beneficial~~ Non-significant impacts on shorebirds and some waterfowl would occur because of the ~~increase~~ decrease in exposed river bottom area. Of the 382 acres of permanent agricultural land impacted, only 108 acres are of good or average quality (less than 1 percent of total in project area). Bird use is very low in the *Distichlis/Cynodon* grassland that would be lost with this alternative. The largest impact on birds would occur with the permanent loss of 747.6 acres of Chihuahuan Desert scrub. Although large, the discontinuous nature of this loss, and eventual replacement over time as the habitat matures, would result in non-significant impacts. There would be no significant impacts on birds with implementation of the Preferred Alternative.

3.7.4.6 River with Year-Round Lower Plants Alternative, Page 3-331

This alternative is similar to the Preferred Alternative except that additional flow would be released at Caballo Dam and less flow would be diverted to the Upper Valley WTP, in order to provide additional flow below American Dam. As a result, the large increase in flow would decrease shallow water habitats of less than 6 inches of water in the river by a maximum of 306 acres (see Table 3.7-10), and would decrease the area of bottom exposed by a maximum of 1,204~~215~~ acres (see Table 3.7-11). ~~When impacts are assessed singly, non-s~~Significant impacts would occur on wildlife communities. ~~However, a~~Aquatic herptiles (primarily turtles) and wintering waterfowl and birds would be significantly impacted from November through February by the combined loss of 500-plus acres of shallow riverine habitat and sandbars.

3.7.4.6 River with Year-Round Lower Plants Alternative, Page 3-332

TABLE 3.7-11
Changes in Monthly Bottom Area Exposed (Acres) for Median Operational Flows* for the River with Year-Round Lower Plants Alternative, Phase 1

	Reach											
	R1	**R2**	**SEL**	**LC1**	**M1**	**M2**	**M3**	**M4**	**LV1**	**LV2**	**LV3**	**Total**
Month	**Acres**											
October	1	8	0	7	20	7	29	2	0	0	0	+74
November	-38	-360	-61	-125	-86	-53	-65	-5	-4	-23	-72	-892
December	-38	-384	-75	-159	-141	-2	-101	-8	-5	-37	-99	-1,049
January	-26	-384	-83	-166	-144	-93	-118	-11	-7	-46	-126	-1,204
February	-3	-80	-20	-54	-147	-91	-131	-11	-7	-50	-135	-729
March	0	0	0	0	14	0	7	0	-24	0	0	-3

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

3.7.4.7 River with Combined Plant Alternative, Page 3-333

This alternative is the same as the Preferred Alternative except the Anthony Area WTP would not be constructed.

Minor changes in river flow would occur with the implementation of this alternative. Effects of f~~F~~low changes during Phase 1, as expressed in water less than 6 inches deep and monthly bottom area exposed (see Tables 3.7-12 and 3.7-13), would be ~~most~~ generally similar to the ~~River with Year-Round Lower Plants~~Preferred Alternative. ~~The only exception is that roosting habitat would increase under this alternative.~~ Minor, insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999a). During Phase 2 and Phase 3, exposed bottom area would be similar to Phase 1. Non-significant impacts would occur on wildlife species because the combined habitat loss would not reach significant adverse levels.

3.7.4.7 River with Combined Plant Alternative, Page 3-334

TABLE 3.7-13
Monthly Changes in Bottom Area Exposed (Acres) for Median Operational Flows* for the River with Combined Plant Alternative, Phase 1

	Reach											
	R1	R2	SEL	LC1	M1	M2	M3	M4	LV1	LV2	LV3	Total
Month	Acres											
October	0	-9	0	-4	-8	-2	7	0	0	0	0	-16
November	-19	-105	-18	-47	-26	-12	124	4	2	20	45	-32
December	-27	-225	-36	-92	-58	-10	167	3	2	13	36	-227
January	-17	-249	-44	-108	-89	-86	105	0	1	7	18	-462
February	-1	-25	-18	-16	-96	-84	92	0	0	0	0	-148
March	0	0	0	0	0	0	0	0	0	0	0	0

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

3.7.4.8.3 Total Impacts, Page 3-337

Total project impacts from this alternative would be similar to those predicted for the Preferred Alternative, except for the following features. A total of 22 acres of disturbed scrub (15 acres) and Chihuahuan Desert scrub (7 acres) would be permanently impacted during construction of the Westside Regulating Reservoir. Construction of the Leasburg WTP would permanently impact 71 acres of Chihuahuan Desert scrub habitat. Construction associated with the Texas-New Mexico Aqueduct would result in a combined 165 acres of permanent (82.5 acres) and temporary (82.5 acres) impacts on agricultural habitat. Because the Chihuahuan Desert scrub impacts are separated (and would eventually regenerate), the loss of more than 500 acres is not considered significant.

Minor changes in river flow would occur with the implementation of this alternative. Effects of ~~F~~flow changes for Phase 1, expressed in water less than 6 inches deep and monthly bottom area exposed, are presented in Tables 3.7-14 and 3.7-15. Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999a). ~~Although the change would be slightly greater with this alternative, n~~Non-significant impacts on wildlife species would occur because the habitat loss would not reach significant negative levels, except in January, when the combined loss of shallow riverine habitat and sandbars would exceed 500 acres.

3.7.4.8.4 Mitigation, Page 3-337

~~No significant negative impacts on wildlife were identified during the impact analysis; therefore, n~~No mitigation measures are proposed for the significant negative impacts on wildlife in January, for the same reasons as described in Section 3.7.4.6.2 for the River with Year-Round Lower Plants Alternative. –.

3.7.4.8.5 Unavoidable Adverse Impacts, Page 3-337

~~No unavoidable adverse impacts were identified during the impact analysis, although minor displacements and habitat loss would occur at the locations of several project features.~~A combined loss of 500-plus acres of shallow water and exposed river bottom habitat would be an unavoidable adverse loss to shorebirds, some waterfowl, and herptiles.

TABLE 3.7-15
Changes in Monthly Bottom Area Exposed (Acres) for Median Operational Flows* for the Aqueduct with Local Plants or Combined Plant Alternatives, Phase 1

	Reach											
	R1	R2	SEL	LC1	M1	M2	M3	M4	LV1	LV2	LV3	Total
Month	Acres											
October	0	-7	0	-4	17	5	3	0	0	0	0	+14
November	-29	-125	-30	-71	58	15	10	-1	-1	-3	-18	-195
December	-32	-303	-46	-112	34	79	0	-3	-2	-10	-27	-422
January	-20	-293	-51	-122	11	-10	-13	-8	-2	-17	-45	-570
February	-1	-40	-32	-23	3	-7	-26	-7	-3	-20	-54	-210
March	0	0	0	0	0	0	0	0	0	0	0	0

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

3.7.4.9.1 Total Impacts, Page 3-338

Impacts associated with this alternative would be identical to those listed for the Aqueduct with Local Plants Alternative, except the Anthony Area WTP would not be constructed. Therefore, total project impacts would not include 40 acres of permanent impacts and 5 acres of temporary impacts on agricultural land. This alternative would also result in fewer transmission line impacts on agricultural land (65 acres), Chihuahuan Desert scrub (10 acres), and previously cleared land (11 acres).~~ Finally, t~~This alternative would not require the construction of the Anthony WTP diversion/conveyance features and would therefore not include the associated 3 acres of permanent and 3 acres of temporary impacts on *Distichlis/ Cynodon* grassland. There would be a combined loss of 500-plus acres of shallow riverine and sandbar habitat in January.

3.7.4.9.2 Mitigation, Page 3-338

~~No significant negative impacts on wildlife were identified during the impact analysis; therefore, n~~No mitigation measures are proposed for the same reasons as described for the Aqueduct with Local Plants Alternative.

3.7.4.9.3 Unavoidable Adverse Impacts, Page 3-339

~~No~~ Except for the loss in January of 500-plus acres of habitat used by herptiles, shorebirds, and wintering waterfowl, no unavoidable adverse impacts were identified during the impact analysis~~,~~. ~~although m~~Minor displacements and habitat loss would occur at the locations of several project features.

3.8.4.5.1.2.1 Birds, Page 3-378

Habitat for neotropical cormorant and wintering bald eagles would change because of the increase in water levels. Two habitat parameters were selected to determine habitat losses and gains associated with the Preferred Alternative. The first is water less than 6 inches deep and the second is exposed bottom area. Water less than 6 inches deep was selected as a habitat parameter because a reduction in this habitat could result in a decrease of prey availability (loss of fish nursery habitat) for wintering bald eagles. The second is exposed bottom area or the total area not covered by water from bank to bank. Sandbars are an example of exposed bottom area. These Rio Grande habitats are used by neotropical cormorants and wintering bald eagles for roosting.

Feeding, loafing, and roosting habitat would potentially decrease in the winter months with the increase in flow and water level. A maximum of 53 acres of shallow water (less than 6 inches deep) would be lost in the river corridor with implementation of the Preferred Alternative (see Table 3.8-14). This loss is small and would not impact foraging or fish populations in the river corridor. Any effects on neotropical cormorant and bald eagle feeding habitat would be non-significant because of the small loss of potential feeding habitat in the project area: 7.2 percent or 53 acres lost of 732 acres available. Insignificant losses (less than 500 acres) in exposed sandbar and shoreline habitat would occur in the upper (Rincón 1 through Mesilla 2) reaches and for all river reaches combined (see Table 3.8-15). ~~In fact, exposed sandbar and shoreline habitat would increase by a maximum of 240 acres in the river corridor under the Preferred Alternative (see Table 3.8-15).~~ Roosting sites would increase below the Upper Valley WTP and in the lower valley. Changes in roosting habitat in the river corridor, including the increase in habitat downstream of the Upper Valley WTP, may affect, but not likely adversely affect, bald eagles.

3.8.4.5.1.2.1 Birds, Page 3-379

TABLE 3.8-15
Monthly Changes in Bottom Area Exposed (Acres) for Median Operational Flows[1] for the Preferred Alternative, Phase 1

	Reach											
	R1	**R2**	**SEL**	**LC1**	**M1**	**M2**	**M3**	**M4**	**LV1**	**LV2**	**LV3**	**Total**
Month	acres											
October	0	-9	0	-4	-8	0	0	0	0	0	0	-21
November	-19	-105	-18	-47	-26	-9	124	4	2	20	45	-29
December	-27	-225	-36	-92	-58	-46	167	3	2	13	36	-263
January	-17	-249	-44	-108	-89	-50	105	0	1	7	18	-426
February	-1	-25	-18	-16	-96	-50	92	0	0	0	0	-114
March	0	0	0	0	0	0	0	0	0	0	0	0

~~Source: Boyle Engineering Corporation 1999; CH2M HILL 1999~~
[1]50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999; CH2M HILL 1999

3.8.4.6 River with Year-Round Lower Plants Alternative, Page 3-388

This alternative is identical to the Preferred Alternative except that additional flow would be released at Caballo Dam and less flow would be diverted to the Upper Valley WTP in order to provide additional flow below American Dam. Also, during Phases 1, 2, and 3 a total of approximately 45,000 acres of agricultural land would be converted out of farm production under the proposed water acquisition/land retirement project component as compared to about 33,000 acres under the Preferred Alternative.

Under this alternative, significant increases in flow would occur from November to February. For example, in the Rincón 1 reach the No Action Alternative river flow for 50 percent exceedance flows (median condition) would range from 21 cfs in December to 186 cfs in February. The River with Year-Round Lower Plants flows would range from 333 to 506 cfs (Boyle Engineering Corporation 1999). Water would not be diverted until it reaches the lower WTPs along the river.

The large increase in flow would decrease shallow water habitats (less than 6 inches of water) in the river by a maximum of 306 acres (see Table 3.7-~~-~~10 in Section 3.7, *Wildlife Resources*), and would significantly decrease the area of bottom exposed by a maximum of ~~215~~1,204 acres (see Table 3.7-11 in Section 3.7, *Wildlife Resources*).

3.8.4.7 River with Combined Plant Alternative, Page 3-389

This alternative is identical to the Preferred Alternative except that the Anthony Area WTP would not be constructed.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes during Phase 1, as expressed in water less than 6 inches deep and monthly bottom area exposed, would be most similar to the River with ~~Year-Round Lower Plants~~Preferred Alternative (see Tables 3.7-12 and 3.7-13 in Section 3.7, *Wildlife Resources*). ~~The only exception is that roosting habitat would increase under this alternative.~~ Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999). During Phase 2 and Phase 3, exposed bottom area would be similar to Phase 1. Non-significant effects would occur on listed species because the habitat loss would not reach significant negative levels.

3.8.4.8 Aqueduct with Local Plants Alternative, Page 3-389

This alternative is similar to the Preferred Alternative except that a regulating reservoir and aqueduct would be built to convey water to the Anthony and Upper Valley WTPs rather than diverting water from the river at the WTP sites. In addition, the Las Cruces Area WTP would be constructed at the Leasburg site rather than the I-10 site.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes for Phase 1, expressed in water less than 6 inches deep and monthly bottom area exposed, are presented in Tables 3.7-14 and 3.7-15 in Section 3.7, *Wildlife Resources*. Habitat reductions for shallow and exposed areas would exceed 500 acres in January. Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999). ~~Although the change would be slightly greater with this alternative, n~~Non-significant effects would occur on listed species because the habitat loss would not reach significant negative levels.

3.9.3.1 Existing and Proposed Recreation Resources, Page 3-392

Comment B2-41

> Improved recreation areas along the Rio Grande in the project region include Elephant Butte Reservoir, Caballo Reservoir, Percha Dam State Park, and Leasburg Dam State Park. ~~These areas are USBR Rio Grande Project facilities that are operated by the New Mexico State Park and Recreation Division.~~ These are lands and facilities of the United States under USBR jurisdiction for the Rio Grande Project. They are managed and operated by the New Mexico State Park and Recreation Division under the terms of a long-term contract with the USBR. Limited opportunities for recreation are available along the river because access is not provided to the public in many areas. In addition, the existing La Llorona Park in the City of Las Cruces and the proposed Rio Grande RiverPark in the City of El Paso have been identified as areas of concern. These facilities are of concern because of the project's potential to affect recreation opportunities along the Rio Grande and at the reservoirs by providing surface water for municipal and industrial purposes.

3.9.3.1.3 Caballo Reservoir, Page 3-393

Comment B2-42

Caballo Reservoir is approximately 25 miles downstream from Elephant Butte Dam in New Mexico. In 1996, USBR prepared a Resource Management Plan that established guidelines for the conservation, protection, development, use, enhancement, and management of lands and resources associated with Caballo Reservoir in order to maximize overall public and resource benefits. Until 1997, the reservoir was drawn down throughout the summer to accommodate irrigation demands downstream of Caballo Dam. ~~Since 1997, and pursuant to a court order, the reservoir has been operated so that the maximum water surface fluctuation is 6.7 feet from February to September (USBR 1999).~~ Since 1997, and pursuant to a settlement agreement approved by the court, the reservoir has been operated so that the maximum fluctuation in water surface elevation is 6.7 feet from February to September (USBR 1999).

3.9.4.7.2 Operation Impacts and Mitigation, Pages 3-398 and 3-399

Comment B4-28

The average-year water surface elevation of Caballo Reservoir associated with this alternative would fluctuate up to 2 feet in Phase 1 during the recreation season when compared to the No Action Alternative. In Phase 2, the average-year water surface elevation would fluctuate 1 to 2 feet, and in Phase 3, the average-year water surface elevation would fluctuate 1 foot. These fluctuations are within the operating parameters that now exist for that reservoir. No impact on recreation opportunities or facilities at this reservoir is expected with this alternative, so no mitigation would be required.

Decreases in Rio Grande flows could compromise the safety of recreationists if low flows create unsafe shallow conditions for swimmers or boaters. Water that is too shallow can also affect the ability of boats to launch safely. Moreover, hunting and fishing activities may be adversely affected if river habitat is adversely affected by flows.

Average-year river flows between Elephant Butte Reservoir and International Diversion Dam expected as a result of this alternative were evaluated for the recreation season from March to October 1. Depending on the month and the river reach, flows would range from 41 percent less than to 20 percent more than the No Action Alternative for Phase 1. In Phase 2, flows would range from 7 percent less than the No Action Alternative to 48 percent more than the No Action Alternative. In Phase 3, flows would range from 8 percent less than the No Action Alternative to 46 percent more than the No Action Alternative. These changes would not significantly affect fishing opportunities nor would they significantly affect dispersed recreation activities that may occur along the river, whether water dependent or water enhanced; therefore, no mitigation would be required.

3.11.4.6.1 Construction Impacts and Mitigation, Pages 3-418 and 3-419

Comment B4-13

TABLE 3.11-2
Construction Duration and Estimated ~~Daily~~ Vehicle Trips for Each Proposed Facility During Phase 1

Facility	Affected Roadways	Construction Period (months)	Estimated Maximum Construction Worker Vehicle Trips During Construction (one-way)	Estimated Average Truck Trips During Construction (one-way)
Hatch WTP	I-25 SH-26 Hall Street SH-154 SH-185	14	118	1,000
Las Cruces WTP	I-10 I-25	24	238	5,300
Anthony WTP (Preferred Alternative, River with Year-Round Lower Plants Alternative, and Aqueduct with Local Plants Alternative)	I-10 Vinton Road SH-20 SH-478 SH-226	16	126	1,100
Anthony WTP (River with Combined Plant Alternative and Aqueduct with Combined Plant Alternative)	I-10 Vinton Road SH-20 SH-478 SH-226	5	12	1,100
Upper Valley WTP	I-10 Vinton Road Levee Road	37	600	21,000
El Paso Aqueduct	I-10 SH-404 SH-213 Martin Luther King Jr. Blvd. SH-54 Sean Haggerty Drive Dyer Street Railroad Drive	25	428	12,000

TABLE 3.11-2
Construction Duration and Estimated ~~Daily~~ Vehicle Trips for Each Proposed Facility During Phase 1

Facility	Affected Roadways	Construction Period (months)	Estimated Maximum Construction Worker Vehicle Trips During Construction (one-way)	Estimated Average Truck Trips During Construction (one-way)
New Mexico–Texas Aqueduct	I-10 Vinton Road Levee Road SH-225 SH-226 SH-227 SH-192 SH-478 SH-228 SH-28	37	60	18,000
ASR Field	SH-375 SH-62/180 SH-54 BR 54	48	128	10,000

SH = State Highway
BR = Business Route

3.14.4.6.1.7.6 Natural Gas, Page 3-449

Comment B4-17

The proposed WTPs may require some natural gas to run backup generators during project construction (Needham 1999). No significant impact on the natural gas systems in El Paso County and Doña Ana County is expected.

The Anthony WTP site has several high-pressure natural gas lines located on and near the site. El Paso Natural Gas Company has four pipelines, three of which span the river (one 12 inch, one 26 inch, and one 30 inch), and one 30-inch line buried under the river. In addition, All American has a crude oil pipeline buried under the river, and Kinder Morgan has a liquid petroleum pipeline that spans the river. Both of these lines are a short distance north of the natural gas pipelines. Construction of the proposed WTP at this site could adversely affect the existing pipelines if they are encountered during project construction activities, such as earthmoving. If the pipelines are damaged during project construction, it would be considered a significant impact because damaging an existing natural gas pipeline could result in a service disruption to customers. The contractor would coordinate with all potentially affected utility companies to avoid damaging the utility lines during project construction.

A Contingency Plan would be developed and implemented prior to the start of construction to mitigate for the significant impact that would occur if a natural gas pipeline is damaged during project construction. The Contingency Plan would address, at a minimum, the following:

1) Notification procedures to be undertaken (the public, the natural gas provider, and emergency response personnel)

2) The procedures to be followed for turning off gas service to the affected pipeline

3) Provisions for providing alternative natural gas service to the affected area to minimize the inconvenience to customers

4) Evacuation procedures to be taken, if necessary

3.15.3 Affected Environment, Page 3-461

Comments B4-19, B4-20, B4-21a, and B4-21b

Except for El Paso's metropolitan area, air quality within the project area is generally good. El Paso, however, consistently exceeds National Ambient Air Quality Standards (NAAQS) that have been designated by the EPA under the Clean Air Act ~~(Parkhill, Smith & Cooper, Inc. and CH2M HILL 1997)~~(EPA 1998; EPA 2000). El Paso is one of only three metropolitan areas in Texas to be designated by the Texas Natural Resource Conservation Commission (TNRCC) as a "non-attainment" area, which fails to meet or attain the NAAQS. Poor air quality in the El Paso area has been associated with industrial practices and with transportation and vehicular effects originating in the larger El Paso/Cd. Juárez region. Categories of non-attainment for El Paso have included respirable particulate matter and PM_{10}~~10~~, defined as particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers. Other categories of non-attainment are ozone, with a federal non-attainment ~~violation~~ classification of serious, and, in a portion of El Paso County, carbon monoxide, with a federal ~~violation~~ non-attainment classification of moderate. Carbon monoxide and particulate levels are typically very high in the lower Rio Grande Valley. High particulate levels have been attributed to the many unpaved streets and roads in the lower valley (Parkhill, Smith & Cooper, Inc. and CH2M HILL 1997). Doña Ana County, New Mexico, includes two non-attainment areas: one is classified as marginal non-attainment for O_3; the other as moderate non-attainment for PM_{10}~~.~~

Categories of air quality attainment for El Paso include sulfur dioxide, nitrogen dioxide, and, since 1986, lead. Also, data indicate that carbon monoxide pollution is improving, and that El Paso may soon be categorized as an attainment area for this pollutant. A number of programs have been implemented by El Paso to control the amounts of carbon monoxide, ozone, and particulate matter in the air and, therefore, to mitigate the effects of the growing population. These programs include the oxygenation of automobile fuel during winter, a vapor recovery system at gas stations, the use of pressure control devices on gasoline pumps during summer, wood burning restrictions when particulate levels are high, paving alleys and streets, and yearly vehicle inspections and testing for carbon monoxide and ozone (Parkhill, Smith & Cooper, Inc. and CH2M HILL 1997).

4.3.5 Wildlife Resources, Page 4-6

There would be permanent and temporary adverse impacts on wildlife resources, including birds, mammals, and herptiles (amphibians and reptiles), as well as project benefits from the Preferred Alternative and the other action alternatives. ~~However, only one~~ Several of these impacts would have significant adverse effects, and they~~it~~ would ~~only~~ occur under three ~~River with Year-Round Lower Plants~~ a~~A~~lternatives. Increased river flows during the secondary irrigation season ~~under this alternative~~ would result in the loss (inundation) of more than 500 acres of exposed river bottom, such as sandbars, shoreline, and islands, as well as~~and~~ shallow feeding habitat from November through February with the River with Year-Round Lower Plants Alternative, and during January with the two Aqueduct Alternatives. These losses would have significant adverse impacts on aquatic herptile communities in the Rio Grande that use exposed surfaces for basking and hibernation, and on wintering shorebirds and some waterfowl because of reduced feeding and roosting habitat. No mitigation is proposed for these~~this~~ significant impacts because~~since~~ there would be concurrent minor benefits to some other waterfowl and fish because of increased flows and water depths during the secondary irrigation season. Inundation of exposed bottom areas and shallow feeding habitat in the Rio Grande would be less extensive under the other action alternatives, and would not result in significant adverse impacts on wildlife resources. ~~Exposed bottom areas and shallow feeding areas would actually increase under the Preferred Alternative and benefit aquatic herptiles, wintering shorebirds, and some waterfowl.~~

4.4 Comparison of Alternatives, Page 4-11

TABLE 4.4-1
Environmental Impact Summary for the Preferred Alternative and Other Action Alternatives

	Preferred Alternative– River with Local Plants	River with Year-Round Lower Plants Alternative	River with Combined Plant Alternative	Aqueduct with Local Plants Alternative	Aqueduct with Combined Plant Alternative
Water Resources	S	S	S	S	S
Land Use	S	S	S	S	S
Aquatic Resources	N	N	N	N	N
Vegetation Resources	N	N	N	N	N
Wildlife Resources	N	S	N	~~N~~S	~~N~~S
Threatened and Endangered Species	NS	NS	NS	NS	NS
Recreation Resources	NS	NS	NS	NS	NS
Cultural Resources	NS	NS	NS	NS	NS
Transportation and Circulation	N	N	N	N	N
Mineral and Energy Resources	NS	N	NS	N	N
Environmental Justice	S	S	S	S	S

TABLE 4.4-1
Environmental Impact Summary for the Preferred Alternative and Other Action Alternatives

	Preferred Alternative–River with Local Plants	River with Year-Round Lower Plants Alternative	River with Combined Plant Alternative	Aqueduct with Local Plants Alternative	Aqueduct with Combined Plant Alternative
Socioeconomics	S	S	S	S	S
Air Quality	NS	NS	NS	NS	NS
Noise	N	N	N	N	N
Health and Safety	NS	NS	NS	NS	NS
Indian Trust Assets	NS	NS	NS	NS	NS

S=Significant Impacts
N=Notable but Not Significant Impacts
NS=No Significant or Notable Impacts

The magnitude and extent of these impacts would be slightly greater under the River with Year-Round Lower Plants Alternative, primarily because of the direct and indirect effects of potentially retiring more irrigated farmland under this than the other alternatives. River flows under this particular alternative would be slightly more beneficial to aquatic resources than the other alternatives because of greater flow increases extending farther downstream during the non-irrigation season, and because of greater flow reductions during the typically high-flow irrigation season. However, this minor benefit to fish would potentially be offset by adverse effects on herptiles, some shorebirds, and waterfowl from inundating a significant portion of exposed river bottom and shallow feeding areas for four months during winter. For this reason, the River with Year-Round Lower Plants Alternative would also have a significant adverse impact on wildlife resources.

5.5.3 Consultation with the Ysleta Del Sur Pueblo

Comment E1-1

As a result of lawsuits filed by the Ysleta Del Sur Pueblo, agreements were reached to extend the consultation period with them. Those agreements are contained in Appendix J, *Legal Agreements Involving the Ysleta Del Sur Pueblo*. Meetings were held among the Ysleta Del Sur Pueblo, the USIBWC, and EPWU/PSB on August 31, 2000; September 22, 2000; and October 10, 2000. In addition, a site visit took place on November 13, 2000.

The extension of the consultation period also resulted in a delay in the release of the Final EIS from the originally scheduled date of August 25, 2000, to no sooner than November 27, 2000.

Chapter 6, Literature Cited, Page 6-13

Comment B4-19

U.S. Environmental Protection Agency. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

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Chapter 8, Acronyms and Abbreviations, Pages 8-1 through 8-7

Comment B3-15

Acronym	*Definition*
B	
BACT	Best Available Control Technology
BEA	Bureau of Economic Analysis
BESTSM	Boyle Engineering Stream Simulation Model
Bhp	brake horsepower
bhp-hr	brake horsepower-hour
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
S	
SAR	sodium absorption ratio
SCS	Soil Conservation Service (U.S.)
Service	U.S. Fish and Wildlife Service
SH	State Highway
SHPO	State Historic Preservation Officer
SMSA	Standard Metropolitan Statistical Area
SO_2	sulfur dioxide

Acronym	Definition
SO_4	sulfates
SPO	Standard Operating Procedure
sp.	species (used when species is unknown or unspecified)
spp.	plural of sp. (multiple unknown species)
sq cm	square centimeter
sq ft	square foot (feet)
sq in	square inch
sq m	square meter
SWPPP	Stormwater Pollution Prevention Plan

Appendix A, Item 6, Erosion and Sediment Control, Page A-2

Comment C4-5

6. Soil or rock stockpiles, excavated materials, or excess soil materials will not be placed near sensitive habitats, including natural water channels, wetlands, and riparian areas, where they may erode into these habitats or be washed away by high water or storm runoff. Waste piles will be revegetated using suitable native species after they are shaped to provide a natural appearance.