

RECLAMATION

Managing Water in the West

Final Environmental Assessment Project No. 2015-017

Amendments to Purgatoire River Water Conservancy District Repayment Contract, Trinidad Dam and Reservoir Operating Principles, and Operating Criteria

United States Department of the Interior
Bureau of Reclamation, Great Plains Region
Eastern Colorado Area Office



Photo Courtesy of United States Army Corps of Engineers

June 2018

MISSION STATEMENTS

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Table of Contents

ACRONYMS	v
INTRODUCTION	1
PURPOSE AND NEED	1
BACKGROUND	3
Trinidad Project	3
Purgatoire River Water Conservancy District	3
Trinidad Dam and Reservoir Project Operating Principles	4
Purgatoire River Water Conservancy District Operating Criteria	5
John Flood and Model Ditches	5
NO ACTION ALTERNATIVE	5
PROPOSED ACTION	5
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	8
Water Resources	8
Prime and Unique Farmlands	11
Land Use and Socioeconomics	11
Threatened and Endangered Species	14
Other Resources	16
Cumulative Impacts	16
SUMMARY	17
CONSULTATION AND COORDINATION	17
General	17
Comments Received on Draft EA	18
Agency Coordination	18
REFERENCES	19

List of Tables

Table 1-Proposed Volumetric Limits and Acres for the Proposed 2018 Operating Principles Amendments.	7
Table 2-Proposed Changes in Monthly Maximum M&I Water Deliveries from Trinidad Reservoir.	9
Table 3-John Flood Ditch Prime Farmlands Affected.....	12
Table 4-Land Use/Ownership with the Purgatoire River Watershed	13
Table 5-2016 Las Animas County Demographic Data.....	14

Table 6-Threatened & Endangered Species with Potential to Occur within the Project Area..... 15

List of Figures

Figure 1-Purgatory River Water Conservancy District Boundary..... 2
 Figure 2-John Flood Ditch Dry-Up Acreage 10

Appendices

APPENDIX A—PROPOSED CONTRACT AMENDMENT NO. 2 BETWEEN THE UNITED STATES OF AMERICA AND THE PURGATOIRE RIVER WATER CONSERVANCY DISTRICT

APPENDIX B—PROPOSED AMENDMENTS TO THE OPERATING PRINCIPLES FOR THE TRINIDAD DAM AND RESERVOIR PROJECT

APPENDIX C—PROPOSED AMENDMENTS TO THE PURGATOIRE RIVER WATER CONSERVANCY DISTRICT OPERATING CRITERIA

APPENDIX D— ARKANSAS RIVER COMPACT ADMINISTRATION RESOLUTIONS

APPENDIX E—2017 CDWR APPROVAL OF PRWCD’S IRRIGATION IMPROVEMENT RULES COMPLIANCE PLAN

APPENDIX F—PRIME SOILS WITHIN THE PRWCD BOUNDARIES

APPENDIX G—2004 ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

APPENDIX H—SUMMARY OF COMMENTS ON DRAFT EA

ACRONYMS

ARCA	Arkansas River Compact Administration
Compact	Arkansas River Compact
Contract	Repayment Contract No. 7-07-70-W0095 (Contract between Reclamation and the Purgatoire River Water Conservancy District)
cfs	cubic feet per second
CDWR	Colorado Division of Water Resources
CPW	Colorado Division of Parks and Wildlife
EA	Environmental Assessment
EQIP	Environmental Quality Improvement Program
FONSI	Finding of No Significant Impact
M&I	Municipal and Industrial
Model	Model Ditch and Land Company
N/A	not applicable
NEPA	National Environmental Policy Act
NRCS	Natural Resource Conservation Service
Operating Criteria	Purgatoire River Water Conservancy District Operating Criteria
Operating Principles	Operating Principles, Trinidad Dam and Reservoir Project
Project	Trinidad Dam and Reservoir Project
PWP	Purgatoire Watershed Partnership
PRWCD	Purgatoire River Water Conservancy District
Reclamation	Bureau of Reclamation
Trinidad	City of Trinidad
USACE	United States Army Corps of Engineers
U.S.	United States
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

INTRODUCTION

This environmental assessment (EA) has been prepared to evaluate environmental impacts associated with the Bureau of Reclamation's (Reclamation) approval of proposed amendments to Repayment Contract No. 7-07-70-W0095 (Repayment Contract between Reclamation and the Purgatoire River Water Conservancy District (PRWCD) (Appendix A), referred to as PRWCD's repayment contract (contract). PRWCD's repayment contract's two exhibits, the Operating Principles, Trinidad Dam and Reservoir Project (Operating Principles) and the PRWCD Operating Criteria (Operating Criteria) are also being amended and are included as Appendix B and C.

Reclamation's approval of these proposed amendments are all federal actions subject to provision of the National Environmental Policy Act (NEPA) of 1969. The amendments would:

- 1) Extend the contract repayment period;
- 2) Amend the method of calculating PRWCD's repayment contract amount;
- 3) Update standard contract articles pursuant to Reclamation policy;
- 4) Approve amendments to both the Operating Principles and Operating Criteria, which are also included as exhibits attached to PRWCD repayment contract.

This EA is prepared in compliance with the NEPA (Public Law 91-190) and under current guidelines established by the Council on Environmental Quality, the U.S. Department of the Interior, and Reclamation. If the environmental effects of the Proposed Action as disclosed in the EA are determined to be insignificant, Reclamation can issue a Finding of No Significant Impacts (FONSI) and an environmental impact statement will not be required.

PURPOSE AND NEED

The purpose of Proposed Action is to:

- 1) Amend PRWCD's repayment contract to reflect the repayment obligations based on the City of Trinidad (Trinidad) and Colorado Division of Parks and Wildlife (CPW) water use that does not go through headgates, meet current policy requirements, and update standard federal contract articles;
- 2) Amend PRWCD's repayment contract to assist PRWCD in meeting its financial obligations;
- 3) Update the Operating Principles approving Trinidad's request to utilize additional water rights from the dry-up of an additional 328.4 acres previously serviced by the John Flood Ditch and acquired to meet Trinidad's current and future municipal delivery needs from Trinidad Reservoir; and
- 4) Update the Operating Principles and the Operating Criteria to reflect the current and future PRWCD operations and to meet PRWCD's goals and obligations.

Trinidad currently uses some of its changed water rights for augmentation of water supplies and has determined that additional acquired water rights and storage in Trinidad Reservoir may be necessary to meet Trinidad's future municipal and industrial (M&I) needs.

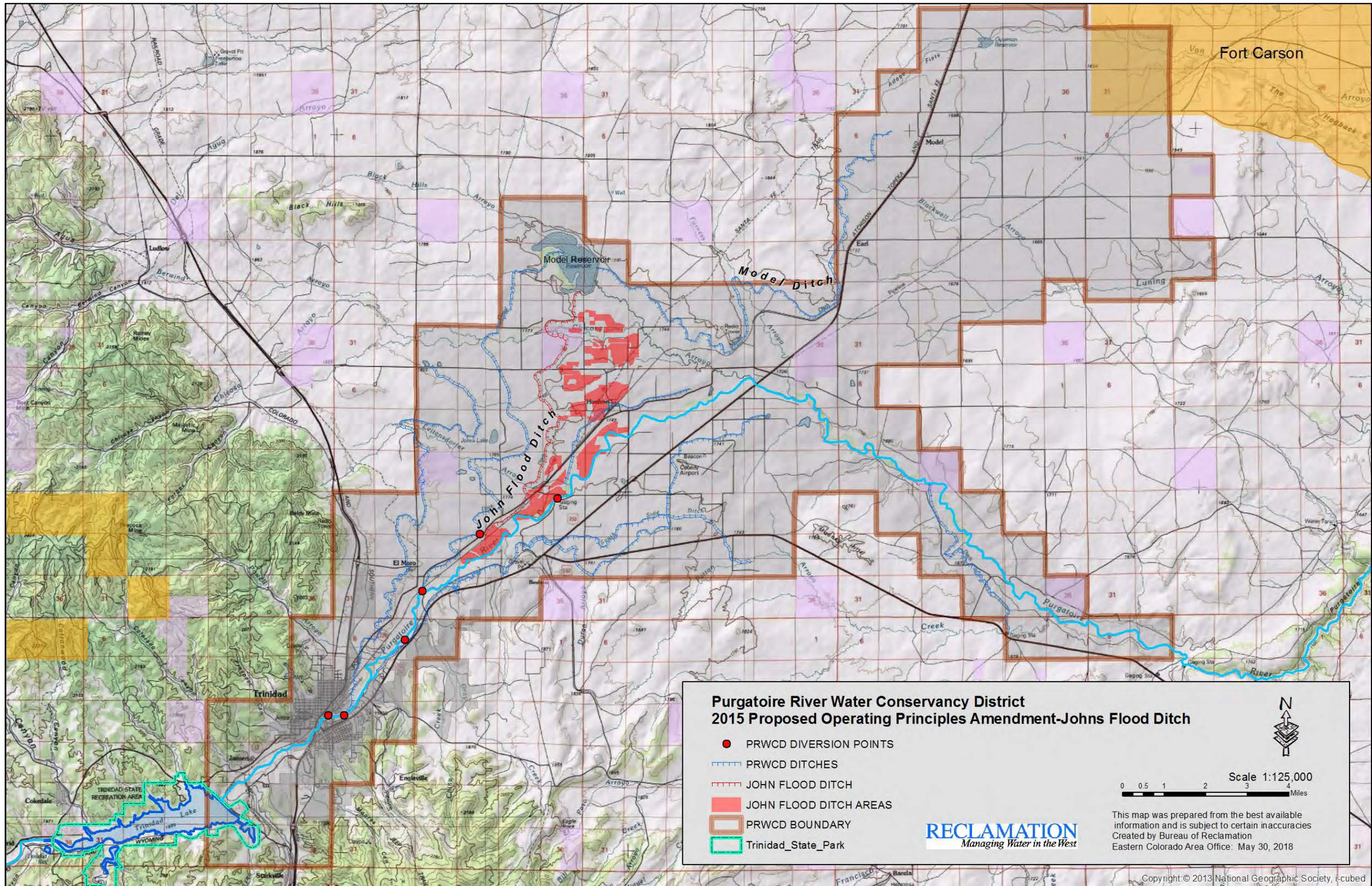


Figure 1-Purgatoire River Water Conservancy District Boundary

Two on-farm irrigation system efficiency improvement projects within the PRWCD boundaries are currently underway that will convert flood irrigation to sprinkler. It is anticipated that additional landowners within PRWCD will also seek efficiency improvement projects to enhance on-farm production and operations, conserve water, and for other environmental benefits. These types of irrigation efficiency projects have necessitated changes in both the Operating Principles and Operating Criteria to address replication of historic return flows, address water storage accounting in Trinidad Reservoir, and comply with State of Colorado laws and regulations and the Arkansas River Compact.

BACKGROUND

Trinidad Project

The Trinidad Dam and Reservoir Project (Project) is located on the upper Purgatoire River, a tributary to the Arkansas River near Trinidad, Colorado (Figure 1). The Project was authorized under the 1958 act, Public Law 85-500, for flood control, sediment control and irrigation. Recreation authorization was included in the 1944 act, Public Law 78-534. The U.S. Army Corps of Engineers (USACE) owns and operates the reservoir with responsibility for flood control and recreation, and CPW manages the area as Trinidad Lake State Park. Reclamation is responsible for administering PRWCD’s repayment contract. PRWCD manages the irrigation portion of the Project and distributes water to the Project participants for irrigation, M&I purposes, and to replace evaporation and seepage from the permanent fishery pool. Under the current Operating Principles, PRWCD distributes water based on “irrigable area” composed as nearly as practical of the acreages identified in PRWCD’s repayment contract. Project ditches and associated irrigated acres include:

Ditch	Irrigated Acres
Picketwire	2,414.7
Baca	319.6
Chilili	300.0
El Moro	176.9
John Flood	2,170.7
Model	7,028.8
Enlarge South Side	6,299.6
Hoehne	1,200.0
Burns and Duncan	229.7
Lewelling & McCormick	467.9

Purgatoire River Water Conservancy District

PRWCD was organized under Colorado State Statutes on December 2, 1960, to provide a legal entity capable of contracting with the United States for repayment of the irrigation and M&I component assigned to the Project and to provide a management entity to oversee the Project. Reclamation and PRWCD executed the PRWCD’s repayment contract on February 10, 1967. The PRWCD’s repayment contract was amended once in 1986.

The Operating Principles defines District Irrigable Area as 19,499 acres of the contracted lands within PRWCD boundaries. The District Irrigable Area is composed as nearly practicable of the acreage identified in contracts with PRWCD. The acreage irrigated by the District Water Supply is limited to the

total of 19,499 acres, less those lands removed from irrigation. The District Water Supply is the water supply of the Purgatoire River subject to PRWCD administration for irrigation and M&I uses within PRWCD's boundaries, which may be used to replace evaporative and seepage from the Permanent Fishery Pool if rights to water stored in the irrigation capacity are acquired by CPW for such purpose.

Other PRWCD responsibilities include: surveying existing water resources and basin rivers, taking actions necessary to "secure ensure an adequate supply of water – present and future," constructing water reservoirs, entering into contracts with other water agencies, organizing special assessment districts, providing for instream flows for fisheries and other legal responsibilities needed by the District to fulfill its purposes (PRWCD 2018).

Trinidad Dam and Reservoir Project Operating Principles

Amendments to the Operating Principles require approval from Reclamation, USACE, PRWCD, Arkansas River Compact Administration (ARCA), and the State of Kansas. The Operating Principles were amended in 1998 and 2004 to provide for M&I uses by Trinidad. Reclamation previously completed NEPA compliance in 2004, which compared 2004 Operating Principles with pre-1998 conditions and amendments to the Operating Criteria (Reclamation 2004). Trinidad's water rights associated with Colorado Water Court Division 2 Case No. 88CW61 and the dry-up of 948 acres were previously analyzed and included in the 2004 Operating Principles amendments. Environmental analysis in this EA focuses on those resources that may be affected by the 2018 amendments and incorporates data and results previously included in the 2004 EA.

A full description of the changes made with the 2004 amended Operating Principles was provided in the Final 1994-2004 Review of Operating Principles and Project Operations, Trinidad Lake Project (Reclamation 2010). Since December 10, 2004, two more amendments were proposed during the current review cycle (2005-2014). In 2012, the District, on behalf of the City of Trinidad, proposed two changes to the Operating Principles. The first change, if approved, would allow the City of Trinidad's Project water stored in the Trinidad Reservoir to be used outside of the District's boundaries, but within the Purgatoire River Basin. The second change, if approved, would increase the acreage limit that could be removed from irrigation within the John Flood Ditch system and would similarly increase the maximum monthly and total annual deliveries of Project water available to the City of Trinidad.

Proposed changes to the Operating Principles are included as Appendix B. ARCA passed Resolution 2012-01 (see Appendix D) authorizing its signing once the other four parties (PRWCD, State of Kansas, USACE, and Reclamation), have approved. Subsequently, ARCA passed Resolution 2014-3 (see Appendix G) separating the two amendments facilitating incremental passage after the City of Trinidad has indicated that the first amendment was a low priority.

Additional information on the Operating Principles is included in the Draft 2005-2014 Review of Operating Principles and Project Operations, Trinidad Lake Project (Reclamation 2018). The report is available online at: https://www.usbr.gov/gp/eca/trinidad/draft_review_trinidad.pdf. An overview of ARCA and administration of the compact between the states of Colorado and Kansas can be found at: <http://www.co-ks-arkansasrivercompactadmin.org/home.html>.

Purgatoire River Water Conservancy District Operating Criteria

The PRWCD Operating Criteria set forth in detail criteria governing PRWCD's administration of water supply in conformity with the general principles and provisions contained in the Operating Principles. The Operating Criteria is separate from the Operating Principles and also is subject to at least one review by PRWCD and Reclamation every ten years. The Operating Criteria was last amended and restated in February 2008. Proposed changes to the Operating Criteria are included as Appendix C.

John Flood and Model Ditches

The John Flood and Model ditches both receive PRWCD water deliveries from Trinidad Reservoir. The 2004 EA evaluated dry-up of some lands serviced by both ditch systems for the water rights owned by Trinidad. The 2004 Operating Principles Amendment authorized dry-up of 948 acres of irrigated lands serviced by the John Flood Ditch and 373.7 acres serviced by Model Ditch. The John Flood Ditch is owned and operated by the New John Flood Ditch Company. The Model Ditch is owned and operated by the Model Land and Irrigation Company (Model).

NO ACTION ALTERNATIVE

For the No Action Alternative, PRWCD's repayment contract would not be amended. The contract repayment period, other contract conditions, Operating Principles and Operating Criteria would be unchanged. Additional John Flood Ditch water rights purchased by Trinidad could not be stored in Trinidad Reservoir to meet Trinidad's M&I uses.

PROPOSED ACTION

Under the Proposed Action, Reclamation would amend PRWCD's repayment contract, Operating Principles, and Operating Criteria amendments. The Proposed Action includes:

- 1) Amending PRWCD repayments contract's "headgate diversion" definition to include water delivered to Trinidad and CPW;
- 2) Updating PRWCD repayment contract's "effective water supply" definition, and correcting a typographical error in the water supply index table;
- 3) Extending the PRWCD repayments contract's repayment period from 70 to 75 years (2059);
- 4) Updating PRWCD's repayment contract's standard articles pursuant to Reclamation policy;
- 5) Approving amendments to and replacing the 2004 Operating Principles as included in PRWCD's repayment contract as "Contract Exhibit A"; and
- 6) Approving amendments to and replacing the 2008 PRWCD Operating Criteria as included in PRWCD's repayment contracts as "Contract Exhibit B."

PROPOSED AMENDMENTS TO PRWCD REPAYMENT CONTRACT

All amendment to PRWCD's repayment contract (Exhibit A) summarized above as Items 1-4, are considered administrative in nature and primarily deal with finances and water accounting.

PROPOSED AMENDMENTS TO THE OPERATING PRINCIPLES

The 2004 amendments to the Operating Principles previously incorporated Trinidad's ownership of 43% of the John Flood Ditch water rights and accommodated Trinidad's dry-up of an additional 948 acres for conversion from irrigation to M& I uses.

The proposed Operating Principles amendments address conversion of Project water from irrigation uses to Trinidad's M&I uses, dry-up of an additional 328.4 acres serviced by the John Flood Ditch, and diversion and storage of this water in Trinidad Reservoir for M&I uses (Exhibit B). Table 1 shows proposed volumetric limits on Trinidad's deliveries of this additional water to M & I storage or permanent fishery pool storage not including delaying return flows and acreage taken out of irrigation and dry-up for the amended Operating Principles. The actual acreage to be dried up under 88CW61 was 843.3 acres, as shown in Table 1 footnotes. Volumetric limits are based on 2.12 acre-feet of historic consumptive use per acre. Water rights associated with the Pioneer Property are included in the additional acreages to be dried-up, but are subject to a pending case in Colorado Water Court (Case No. 17CW3073). The maximum annual volume for the proposed amendments is limited to 3,276 acre-feet per year. Maximum monthly volumetric limits also apply, as shown in Table 1.

PROPOSED AMENDMENTS TO THE OPERATING CRITERIA

The 2018 Operating Criteria amendments would modify use of Model Land and Irrigation Company's storage space reservation in Trinidad Reservoir to include storage of water for use by other PRWCD irrigable areas with the consent of the Model Land and Irrigation Company (Appendix C). Operating Criteria amendments would correct an error in the permanent fishery pool capacity or State Parks Account by 1%, which would be transferred to a subaccount of the State Parks to replace evaporation storage and transit losses associated with the delivery of delayed return flows. Any water transferred to the State Parks subaccount that is not needed may subsequently be transferred to the Permanent Fishery Pool.

Table 1-Proposed Volumetric Limits and Acres for the Proposed 2018 Operating Principles Amendments.

	Decreed Volumetric Limits					Calculated Volumetric Limit	Proposed Volumetric Limits for Amended Operating Principles
	Case No. 88CW61	Case No. 06CW78	Case No. 08CW101	Pioneer Property Case No. 17CW3073	Totals		
April	220	15	21	TBD	256	257.2	257
May	345	23	34		402	403.4	403
June	565	38	55		658	660.6	661
July	685	46	67		798	800.9	801
August	620	41	60		721	724.9	725
September	345	23	34		402	403.4	403
October	160	11	16		187	187.1	187
Decreed Annual Totals	2802	187	272		3261	3276.2	3276
Associated acreage that has been or will be taken out of irrigation, dried up, and revegetated.							
Under John Flood Ditch	843.3	88.0	128.4	112.0	1,171.7		1171.7
Under Model System	373.7	0	0	0	373.7		373.7
Total Acres Dried Up	1217.0	88.0	128.4	112.0	1,545.4		
Notes:							
¹ The volumetric limits in Case No. 88CW61 and in the 2004 Operating Principles were based on dry-up of no more than 948 acres in the John Flood Ditch plus 373.7 acres in the Model system, for a total of 1,321.7 acres. Para 15 of decree in 88CW0601 and Para B.4(a)(1) of the 2004 Operating Principles.							
² The actual area to be dried up under 88CW61 was 843.3 acres under the John Flood Ditch plus 373.7 acres under the Model system, for a total of 1,217.0 ac. Para 6 of Trinidad and New Johns Flood Ditch Company Stipulation for 843.3 acres.							
³ Annual volumetric limit in decree for 88CW061 of 2,802 acre-feet was based on 2.12 acre-feet of historical consumptive use per acre and 1,321.7 acres. (2004 Operating Principles.							
⁴ Trinidad acquired the water rights associated with the Pioneer Property, which includes 112 acres of irrigated area under the John Flood Ditch. These water rights are subject to the pending Water Court application in Case No. 17CW3073.							
⁵ Total irrigated area to be dried up in 88CW61, 06CS78 and 08CW101, and Pioneer property is 1,545.4 acres as shown above.							
⁶ By proportions for the 1,545.4 acres in Trinidad’s cases, the total volumetric limits in the Operating Principles should be increased by 1.16925 (ratio 1,545 ac to 1,321.7 acres.							
⁷ Annual volumetric limits for amended Operating Principles should be 3,276 acre-feet (2,802 x 1.16924). Monthly volumetric limits are calculated similarly in 88CW61.							
⁸ Proposed volumetric limit of 3,276 acre-feet can be calculated as 2.12 acre-feet per ac, multiplied by 1,545.4 acres = 3,276 acres.							
Source: Wheeler and Assoc. 2018.							

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This environmental analysis relies on information and analysis previously included in Reclamation's 2004 EA. Reclamation is following 43 CFR Part 46, Section 46.135-Incorporation of referenced documents for this NEPA analysis. This section establishes procedures for incorporating referenced documents as provided by Council on Environmental Quality regulations at 40 CFR 1502.21.

The affected environment and environmental consequences, related to implementing the Proposed Action, are described for the following resources.

Water Resources

The Purgatoire River runs through three counties in Colorado before its confluence with the Arkansas River. It originates in the Sangre De Cristo Mountain Range of the Rocky Mountains in Las Animas County. The Purgatoire River continues to flow northeasterly through the southeastern portion of Otero County and then continues through west-central Bent County before joining the Arkansas River just above John Martin Reservoir.

The 2004 EA described Trinidad's water uses as augmentation for non-potable uses such as watering school and park lawns, municipal and private golf courses, wells and other municipal uses within PRWCD's boundaries. In some instances, Trinidad leases water back to farmers for irrigation. Trinidad also uses its waters to maintain the original 4,500 acre-feet permanent pool space and leases this same water to CPW to help maintain the additional permanent fishery pool space. PRWCD's boundaries were previously shown in Figure 1.

Trinidad's water supply consists of direct stream flow diversions from the North Fork of the Purgatoire River and a number of creeks of the Purgatoire River Basin stored in North Lake and Monument Lake Reservoirs. Water is delivered via an underground pipeline to the Trinidad Filtration Plant located a few miles downstream of North Lake. The raw water is of high quality and requires only minimal treatment to make it potable. Treated water is then transported through Trinidad's Mountain Water System. This system includes a 36-mile pipeline with a hydraulic capacity of 9 million gallons per day and storage tanks with a capacity of 9.46 million gallons. Under the current system, Trinidad is vulnerable to a major disruption in the treated water supply if the pipeline is damaged (Trinidad 2012). Trinidad also does not have the necessary facilities to convey water from Trinidad Reservoir to their existing upstream filtration plant. An additional water treatment facility within the vicinity of Trinidad Reservoir would provide system redundancy and may be needed in the future to provide system redundancy to meet current and future demands (Trinidad 2012). Additional M&I storage for Trinidad in Trinidad Reservoir plays a major role in meeting current and future needs given Trinidad's remote and aging storage and delivery system.

Under the Proposed Action, of an additional 328.4 acres serviced by the John Flood Ditch could be dried up to increase the maximum monthly deliveries of water for Trinidad's M&I uses. When combining these acres with the 2004 amendments, the Operating Principles would allow the dry-up of no more than 1,171.7 acres serviced by the John Flood Ditch and 373.7 acres serviced by the Model Ditch, or a total of 1,545.4 acres. The 2004 EA analyzed the dry-up of 948 acres of land serviced by John Flood Ditch but the actual acres dried up under Case No. 88CW61 was only 843.3 acres as noted in Table 1.

Trinidad acquired the water rights associated with 112.0 acres of the Pioneer Property as shown in orange in Figure 2. The volumetric decrees associated with this property will be determined in a pending Colorado Water Court application in Case No. 17CW3073. The annual volumetric limits for the proposed Operating Principles amendments are based on 1,545.4 acres x 2.12 acre-feet. of historical consumption for a total of 3,276 acre-feet per year (see Table 1’s footnotes) (Thompson 2015). Proposed changes to Article IV—Irrigation, M&I 4 (a) (1) of the Operating Principles results in the following increases in maximum monthly and annual M&I water deliveries as shown below in Table 2. The sum of monthly maximum M&I deliveries totals 3,437 acre-feet. but the annual maximum volume is restricted to 3,276 acre-feet. To comply with all volume restrictions, not all maximum monthly M&I water deliveries can be met. In any given year, the combined monthly M&I water deliveries need to be reduced by 161 acre-feet. to not exceed the annual maximum volume.

The annual pattern of water demand typically changes when use changes from irrigation to M&I. When water attributable to the historic consumptive use on acreage is removed from irrigation as requested by Trinidad, that water is generally transferred to the Joint Use Pool and is released when Trinidad needs it. The accrued water is typically released year-round and results in more water volume in the reservoir during late-summer, fall and winter months as compared to if it remained for irrigation purposes. Trinidad’s use of the additional storage in Trinidad Reservoir will result in increased reservoir water volumes during late-summer, fall and winter. Under the Proposed Action, Trinidad Reservoir elevations are generally expected to increase and remain higher during the irrigation season as previously described in the 2004 EA.

Maximum monthly M&I water storage volumes will be increased by about 17%. Fluctuations in the pool volume would most likely be limited to a few hundred acre-feet annually. For the No Action Alternative, Trinidad would be limited to the maximum M&I water deliveries included in the 2004 Operating Principles as shown in Table 2.

Table 2-Proposed Changes in Monthly Maximum M&I Water Deliveries from Trinidad Reservoir.

Month	Maximum Monthly M&I Water Deliveries (acre-feet.)		% change
	2004 Operating Principles	Proposed 2015 Amendment	
Apr	220	257	+16.8%
May	345	403	+16.8%
Jun	565	661	+12.0%
Jul	685	801	+16.9%
Aug	620	725	+16.9%
Sep	345	403	+16.8%
Oct	160	187	+16.9%
Nov-Mar	0	0	No Change
Annual Total	2,802	3,276	16.9%

Under the Proposed Action, approval of the proposed Operating Criteria amendments modify use of Model storage space reservation in Trinidad Reservoir to allow storage of water used by other PRWCD irrigable acres with the consent of Model. The Operating Criteria amendments would authorize Model water to be stored in the Joint Use Pool space for release after the irrigation season to replace the loss of return flows associated with the conversion of lands from flood irrigation to sprinkler.

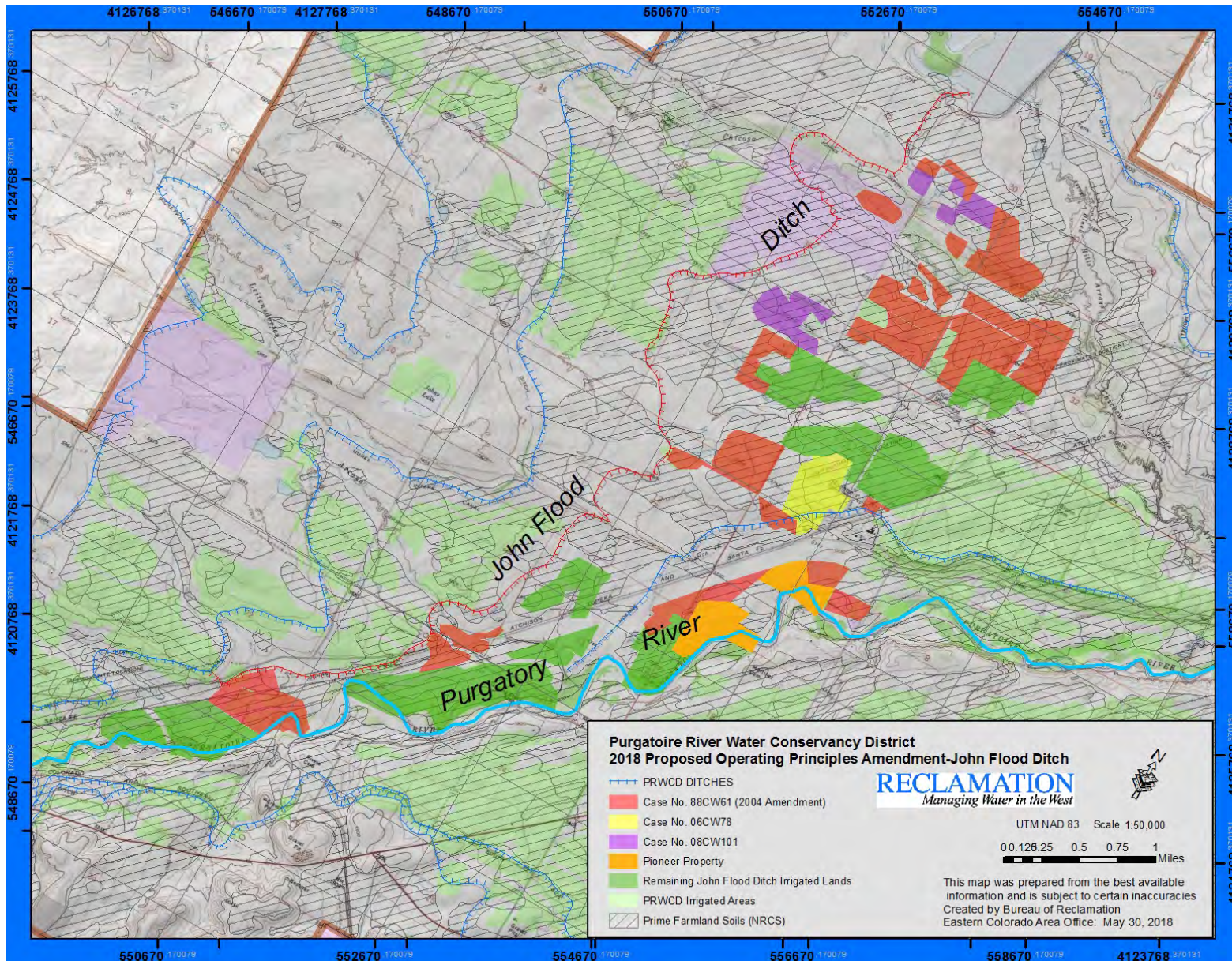


Figure 2-John Flood Ditch Dry-Up Acreage

Replacement water plans are required for all irrigation practices that are recognized by the Colorado Division of Water Resources (CDWR) to increase consumptive use or alter historic return flows patterns. However, Rule 10 of the *Compact Rules Governing the Improvement to Surface Water Irrigation Systems in the Arkansas River Basin in Colorado* provides an opportunity for growers to apply for surface water system improvements as a collaborative group and replace reduced irrigation return flows. The rules went into effect in 2011 and PRWCD received CDWR approval of its 2017-2018 Irrigation Improvement Rules Compact Compliance Plan Application (see Appendix E). The compliance plan is for PRWCD member's improvement to irrigation systems on two farms. Leased water stored from the Model represents a portion of the Model Ditches water rights under the PRWCD's Project water supply. A second source of water is derived from the Enlarged Southside Ditch Project supply for maintenance of return flows for the improvement covered in the compliance plan and will be released from Trinidad Reservoir as needed to maintain monthly return flows.

The proposed amendments to the Operating Criteria support return flow requirements, as described above and already approved and implemented by the State of Colorado. The changes do not result in additional water stored in Trinidad Reservoir. Rather, the saved water resulting from the improvements is released later in the year to provide augmentation flows outside the irrigation season. The saved water storage needs to be stored in the joint use pool for release outside the irrigation season and necessitates the proposed changes to the Operating Criteria. As the number of irrigation improvements within PRWCD boundaries increases, additional Rule 10 requirements could be accommodated with CDWR approval of amendments to the compliance plan. The Operating Criteria amendments would also correct an error in the permanent fishery pool capacity in the CPW subaccount by changing 0.65 acre-feet to 0.64 acre-feet/ per acre-foot or about 1%). This 1% is being transferred to a new CPW subaccount to replace evaporation during storage and transit losses associated with delivery of the CPW subaccount's delayed return flows. Any water transferred to the CPW subaccount not needed to replace such evaporation and transit losses may subsequently be transferred to the Permanent Fishery Pool.

Under the No Action Alternative, maximum M&I water deliveries to Trinidad included in the 2004 Operating Principles, as shown in Table 2, would remain unchanged.

Prime and Unique Farmlands

Prime and unique farmland, as defined by the U.S. Department of Agriculture, is land with the best combination of physical and chemical characteristics for producing food, feed and forage, fiber, and oilseed crops and is available for those uses, based on soils. Prime and unique farmlands can be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas.

Within Las Animas County, approximately 46,000 acres are used for crops or permanent pasture and about 36,000 acres are irrigated. Alfalfa hay is the primary crop with lesser amounts of grass hay, corn, oats, and barley (NRCS 2009 and 2015). Within the PRWCD boundaries, up to 19,499 acres received water for from the Trinidad Project. A total of 2,170.7 "irrigable acres" are associated with the John Flood Ditch. The additional 324.8 acres serviced by the John Flood Ditch that could be dried up under the Proposed Action have been historically used for alfalfa and grass hay production (Colorado 2015).

Reclamation conducted an analysis using geographic information systems using Natural Resource Conservation Service (NRCS) data (NRCS 2009) accessed via NRCS's Websoil Survey. The

analysis identified approximately 43,300 acres within PRWCD boundaries with soils classified as “Prime Farmland, If Irrigated;” however, the Operating Principles Article IV, B(1) limits the District Irrigable Area to 19,499 acres of contracted lands composed as nearly as practicable of the acreage identified in contracts, which total 20,607.9. Soil types meeting this definition are in Appendix E.

Of the acres of irrigated lands included within the PRWCD boundary and serviced by the PRWCD ditches, 14,042 acres are listed as prime farmland, if irrigated. The 2004 Operating Principles Amendments included 733 acres of prime farmland, if irrigated. One hundred percent of the 88 acres associated with Case No. 06CW78, 80% of the 128 acres associated with Case No. 08CW101, and 48% of the 112.0 associated with the Pioneer Property have soils listed as prime farmland, if irrigated, as shown in Table 3 and Figure 2.

Table 3-John Flood Ditch Prime Farmlands Affected

Areas	2004 Amendment	Proposed Amendment			Acres Total for Proposed Amendment	Acres Total
	Acres Case No. 88CW61 (2004 Amendment)	Acres Case No. 06CW78	Acres Case No. 08CW101	Acres Pioneer Property		
Dry-up Acres John Flood Ditch	843.3*	88	128.4	112	328.4	1,171.7
Prime, if irrigated Acres John Flood Ditch	733	88	103	54	245	978
Percent of Total	87%	100%	80%	48%	33%	84%

*Adjusted from 948 acres analyzed in the Reclamation’s 2004 EA.

The proposed amendment to the Operating Principles would allow for additional M&I deliveries to Trinidad associated with dry-up of an additional 328.4 acres with 245 of these acres being classified as prime farmland. This would result in an increased dry-up of about 33% of lands serviced by the John Flood Ditch when compared to the 2004 amendment as shown in Table 3 and Figure 2.

Figure 2 also displays lands serviced by the John Flood Ditch that will continue to receive irrigation as well as John Flood Ditch lands to be removed from irrigation by each water rights change case. Acreages of prime farmland are also shown. As an average of the total irrigated acres within the PRWCD boundary listed as “prime, if irrigated” (14,042 acres), the Proposed Action would increase deliveries to M&I uses associated with a cumulative reduction of approximately 6.96% of currently irrigated prime farmland under the John Flood Ditch.

As previously described in the 2004 EA, Trinidad’s use of M&I water from Trinidad Reservoir is expected to be limited for the reasonable future. Portions of Trinidad’s M&I water supply not currently needed for M&I purposes may be leased back to irrigators for agricultural uses, until needed. The number of acres to be dried-up is proportional to number of acre-feet used for M&I water deliveries.

The primary significance of increased M&I deliveries associated with removing irrigation from prime farmlands is the economic impact on individual farmers by reducing productivity. Nationally, the loss of the most economically productive farmlands through urban development is of concern. The proposed amendment would accommodate the transfer of water from storage for irrigation to storage for M&I uses. Reduction of available irrigation water is not expected to result in significant direct losses of prime farmlands or preclude continued farming of these lands. These lands would likely remain in agriculture and produce dryland crops and/or serve as pasture. General land uses and socioeconomic impacts are discussed in the next section.

Land Use and Socioeconomics

Land use and landownership discussions are generalized for the Purgatoire River Watershed and the socioeconomic scope of this environmental analysis is primarily limited to Las Animas County. The Proposed Action's only potential to directly affect lands and economics are within PRWCD boundaries and Trinidad State Park, all of which are in Las Animas County.

Most of the Purgatoire River watershed is privately owned (61.3%) with large private landowners owning most of the forests in the upper watershed. In the early years of statehood, coal companies purchased lands west of Interstate 25 and agriculture dominates land to the east, consisting primarily of cattle ranches and grass feed production. Table 4 breaks down land use/ownership (PWP 2014).

Table 4-Land Use/Ownership with the Purgatoire River Watershed

Land Use/Ownership*	Acres	% of Watershed
Private Property	1,353,931.5	61.3
Piñon Canyon Maneuvering Site	259,978.3	11.8
State Lands	224,845.2	10.2
Comanche National Grasslands	205,644.8	9.3
State Wildlife Areas (CPW)	75,733.9	3.4
San Isabel National Forest	69,962.8	3.2
Trinidad Lake	9,617.3	0.4
Bureau of Land Management	7,737.2	0.4
Total Area	2,207,451	100

Source: PWP 2014.

The U.S. Army manages 259,978 acres of federal land as the Piñon Canyon Maneuver Site as part of Fort Carson just downstream of the Trinidad Project. It includes lands along Purgatoire River in Purgatory Canyon.

Las Animas County has a rich mining history and recently experienced a resurgence in coalbed methane and coal mining and exploration. Like many in southeastern Colorado, Trinidad is a boom and bust community (PWP 2014). It is the county seat and Las Animas County's largest municipality. Southeastern Otero and central Bent Counties, two downstream Purgatoire River counties, have also experienced similar fates; however, agriculture (farming and ranching) is an important economic element in the Tri-County area.

In 2004, approximately 10,300 people lived in Trinidad. Black & Veatch (2001) projected Trinidad's demand for water would most likely continue to grow based upon population growth from about 2% to 3.5% by 2020. But instead of increasing as projected, Trinidad's population in 2013 shrunk by about 22% to an estimated 8,465 people. Las Animas County also shows a declining population trend from 17,385 county residents in 2004 to 14,238 in 2017 (US Census 2018). Based on current population trends, Trinidad's municipal water demand is not anticipated to increase much in the near future. However, as previously discussed, Trinidad's aging water supply system is vulnerable to system outages and additional storage in Trinidad reservoir is needed to provide system redundancy and to meet the current municipal needs in the future.

The 2017 Las Animas County population was estimated at 14,238 (U.S. Census 2018). The U.S. Census estimated an 8.2% population decline between 2010 and 2017. Demographic 2016 data for Las Animas County are listed in Table 5.

Table 5-2016 Las Animas County Demographic Data

Race	
White	90.8%
Black or African American	1.9%
American Indian and Alaskan Native	3.6%
Native Hawaiian and Other Pacific Islander	0.1%
Two or More Races	2.4%
Hispanic Origin	
Hispanic or Latino	42.2%
White alone, not Hispanic or Latino	52.7%

Source: US Census 2018.

In 2016, the median household income in Las Animas County in 2016 was \$42,808. Per capita income was reported as \$23,857 with 21.6% of the population at or below the poverty rate (U.S. Census 2018).

The 2012 Census of Agriculture collected by the US Department of Agriculture indicate that 602 farms in Las Animas County with crops sale market value of \$3,170,000 or 11% of the total market value of products sold. Livestock sales represented 89% of the market value totaling \$28,431,000, and the average farm income was \$47,227 (USDA 2012). Because the lands removed from irrigation are anticipated to remain in agriculture, no significant impacts to the regional agricultural economy is predicted. Portions of Trinidad’s M&I water supply not currently needed for M&I purposes may be leased back to irrigators for agricultural uses until need.

Under the Proposed Action, Reclamation would extend the PRWCD’s Project repayment period from 70 to 75 years, the maximum allowable under Reclamation’s regulations. PRWCD’s repayment contract is a variable rate contract, based on water supply and agricultural parity prices. Minimum payment amount is \$20,000 per year, and maximum is \$140,000. Annual repayments originally needed to average \$91,937 per year to repay \$6,435,590 construction costs over 70 years. However, due to drought and low agricultural prices, PRWCD has only averaged \$60,237 per year. In order to repay the Contract in the current 70-year period, the PRWCD needs to average \$121,310 for the remaining 37 years. If PRWCD’s repayment contract is extended to 75 years, the average annual repayment amount needed to repay would be reduced by \$14,311 annually to \$105,900 per year for 42 years. PRWCD is currently contemplating seeking congressional authorization to extend the repayment period to an even longer period to reduce annual payments further.

Threatened and Endangered Species

Three species listed as threatened or endangered under the Endangered Species Act and one proposed listing species were identified by the U.S. Fish and Wildlife Service (USFWS) as potentially within the general Project Area in 2018 (USFWS 2018a). No critical habitat has been designated or proposed within the Project Area. Descriptions of each species are summarized below and in Table 6 using information from the USFWS’s Environmental Conservation Online System (USFWS 2018b).

Canada Lynx-Canada lynx are medium-sized cats with large feet adapted to walking on snow, long legs, tufts on the ears, and black tipped tails. Federally listed as a threatened species,

Table 6-Threatened & Endangered Species with Potential to Occur within the Project Area.

Common Name	Scientific Name	Federal Species Status	Designated Critical Habitat within Project Area	General Habitat Description
Canada Lynx	<i>Lynx canadensis</i>	Threatened	No	Coniferous and mixed forests with thick undergrowth, deep snow, and high density snowshoe hare prey base.
New Mexico Meadow Jumping Mouse	<i>Zapus hudsonius luteus</i>	Endangered	No	Persistent emergent herbaceous and scrub-shrub wetlands up to 8,000 feet in elevation.
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	No	Mature or old-growth forests or rocky canyon habitats.
North American Wolverine	<i>Gulo luscus</i>	Proposed Threatened	Not applicable	Alpine, boreal, and arctic habitats including boreal forests, tundra, and western mountains.

Canada lynx are most closely associated with dense snowshoe hare populations in coniferous and mixed forests with thick undergrowth. No critical habitat is designated in Colorado and the Project Area lacks suitable habitat to support Canada lynx.

Critical habitat was designated by the U.S. Fish and Wildlife Service in New Mexico, Colorado and Arizona in 2016. The designation includes an isolated population in southern portion Las Animas County, Colorado and Colfax County New Mexico along Chicorica Creek watershed and Lake Maloya upstream of New Mexico’s Sugarite Canyon State Park near Raton, New Mexico. Chicorica Creek is a tributary to Canadian River and the New Mexico Meadow Jumping Mouse is not known to occur in the upper Arkansas River watershed.

Mexican Spotted Owl-The Mexican spotted owl is a dark eyed mottled, irregularly white spotted, medium-sized owl without ear tufts. One of three subspecies of spotted owls that occur in North America, it was listed by the USFWS as threatened in 1993.

Nesting and roosting habitats are primarily limited to forested and rocky-canyon habitats and most commonly associated with mature or old-growth stands with complex structure. Critical habitat was designated in 1994 and most recently revised in 2004. Critical habitat is in Arizona, New Mexico, Utah and Colorado. The Project Area lacks suitable habitat to support Mexican spotted owl.

North American Wolverine-North American wolverine is a federal candidate species proposed to be listed as threatened. It is a large terrestrial member of the weasel family resembling a small bear with a bushy tail. The historic range of the wolverine includes high elevation areas in Colorado, Idaho, Minnesota, Montana, Nevada, North Dakota, Utah, and Wyoming. Wolverines live in a wide variety of alpine, boreal, and arctic habitats including boreal forests, tundra, and the western mountains. No wolverine habitat is in the Project area.

Based on the species and habitat descriptions above, Reclamation has determined that both the No Action and Proposed Action will have “no effect” to federally listed and proposed species.

Summary-The Project Area lacks suitable habitat and/or is outside the historic range of Canada lynx, New Mexico meadow jumping mouse, Mexican spotted owl, and North American wolverine, therefore, additional consultation with the USFWS is not required under Section 7 of the Endangered Species Act.

Other Resources

Other resources evaluated included the Arkansas River Compact, recreation, floodplain, wetlands, migratory birds, environmental justice, Indian trust assets, Indian sacred sites and cultural resources. These resources were discussed in Reclamation’s 2004 EA and are incorporated by reference. There are no construction activities associated with the Proposed Action and the environmental effects of the Proposed Action remain consistent with the findings in Reclamation’s FONSI dated November 12, 2004 (See Appendix F).

The Arkansas River Compact Administration adopted Resolution No. 2014-3 (Appendix D), the proposed Operating Principle amendments included in the Proposed Action at the 2014 Annual Meeting on December 17, 2014, in Lamar, CO.

Cumulative Impacts

Cumulative impacts are impacts on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

There are no new construction activities associated with the Proposed Action. However, it is reasonably foreseeable that additional PRWCD landowners will improve irrigation efficiency by converting from flood irrigation to sprinkler systems. Federal and state agencies offer incentives for these conversions providing environmental and economic benefits. Within the Arkansas River Basin, Colorado has adopted Rule 10 as previously discussed, and there are reportedly pending NRCS applications for future conversion projects. NRCS completes NEPA compliance under their Environmental Quality Incentive Program (EQIP) and other programs to reduce erosion, deep percolation, sediment, selenium, salts and nitrate loadings into the Arkansas River (NRCS 2018).

Reclamation’s cumulative analysis includes the area from Trinidad Reservoir downstream to the confluence of the Purgatoire and Arkansas Rivers. Any land use changes in this area are subject to local land use decisions by Las Animas, Otero and Bent counties and Trinidad. Any cumulative impacts associated with continued operations of the Project are included in this analysis and have been previously addressed in the 2004 EA. The proposed amend amendments to the Operating Principles would increase the lands removed from irrigation by Trinidad for M&I uses from 1,17.0 to 1,545.4 acres as previously shown in Table 1. The Proposed Action would result in the dry-up of 245 acres of additional Prime, if irrigated lands as previously shown in Table 3. The cumulative effects of reducing available irrigated water is not expected to result in significant direct losses of prime farmlands or preclude farming of these lands. These lands would likely remain in agriculture and produce dryland crops and/or serve as pasture. No significant cumulative impacts are predicted.

Delivery of Project water outside the PRWCD's boundaries could result in additional environmental effects not included as cumulative impacts. However, boundary changes have not been proposed and Reclamation approvals of PRWCD land inclusions are outside the scope of the Proposed Action. The Secretary of the Interior's assent to any land inclusion associated with the Project may require additional NEPA analysis and compliance documentation.

SUMMARY

Proposed amendments to PRWCD's repayment contract are administrative in nature and the scope is generally limited to PRWCD's finances and accounting. Under the Proposed Action, PRWCD's repayment contract would be extended to 75 years and the average annual repayment amount needed to repay the United States would be reduced by \$14,311 annually for the 42 years.

Proposed amendments to the Operating Principles would allow the dry-up of an additional 328.4 acres of previously irrigated land purchased by the City of Trinidad. The amendment will allow Trinidad to use additional storage in Trinidad Reservoir for M&I use and is likely to result in increased reservoir water volumes during late-summer, fall and winter. The 328.4 acres removed from irrigation is likely to remain in agriculture and produce dryland crops and/or serve as pasture.

Trinidad Reservoir elevations are generally expected to increase and be higher during the irrigation season as previously described in the 2004 EA. Maximum monthly M&I water delivery volumes would increase by about 17%. Fluctuations in the pool volume would most likely be limited to a few hundred acre-feet. annually. Reservoir recreation and fisheries resources would also benefit with the additional water storage.

Proposed amendments to the Operating Criteria allow for accounting saved water as a result of irrigation efficiency improvement to be stored in the Model account as M&I water for augmentation releases later in the season. The proposed amendments also correct an error in the permanent fishery pool capacity or CPW account by 1%.

There would be no impact to the Purgatoire River below the Hoehne headgate (13 miles below Trinidad Reservoir) collectively for all the proposed amendments. Minor increases in average flow are expected during the non-irrigation season.

The Arkansas River will not be affected, and the Proposed Action will not result in a material depletion at the Kansas State Line. Consequently, it will not impact the Arkansas River Compact as previously described in the 2004 EA.

The Proposed Action will have no effect on threatened or endangered species, historic properties, land use, environmental justice, Indian trust assets or Indian sacred sites.

CONSULTATION AND COORDINATION

General

Reclamation conducted informal discussions with federal, state, and local agencies to identify issues and concerns associated with the Proposed Action (See Agency Coordination). In addition, Reclamation relied on issues identified previously during planning and NEPA

compliance completed for the 2008 amendments to the Operating Criteria and the 2004 amendments to the Operating Principles.

Comments Received on Draft EA

On April 19-21, 2018, Reclamation ran paid public notices in the three local newspapers in Southeastern Colorado and one newspaper in Garden City, Kansas. The public notice announced the Draft Repayment Contract and Draft EA as being available for public review and comment. Comments on the Draft EA were requested within 30 days with comments on the draft due within 60 days of the public notice. Copies of all written comments are included in the project files and available by request. A summary of the comments received and Reclamation's responses are included as Appendix H. Where appropriate, changes were incorporated into the Final EA.

Comments on the draft EA were received by the following:

Purgatoire River Water Conservancy District
City of Trinidad
U.S. Army Corps of Engineers
Colorado Department of Natural Resources
Kansas Department of Water Resources

Agency Coordination

Reclamation contacted and coordinated with the following local, state and federal agencies during development of the proposed amendments and environmental assessment.

Federal Agencies

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Arkansas River Compact Administration

State Agencies

Colorado Division of Water Resources
Colorado Water Conservation Board
Kansas Division of Water Resources

Local Agencies and Organizations

City of Trinidad
Purgatoire River Water Conservancy District

REFERENCES

Black & Veatch 2001. Preliminary Treated Water System Report. Study prepared for the City of Trinidad, Colorado.

Colorado 2015. Colorado's Decision Support Systems Division 2 (Arkansas Basin) GIS data set. Division 2 Irrigated Lands 2015. Colorado Department of Natural Resources website: <http://cdss.state.co.us/GIS/Pages/Division2Arkansas.aspx>. Accessed June 25, 2018.

NRCS 2015. Web Soil Survey. US Department of Agriculture, Natural Resource Conservation Service Website: <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed between February 2 to March 2, 2015.

NRCS 2009. Soil Survey of Las Animas County Area, Colorado, parts of Huerfano and Las Animas Counties. US Department of Agriculture, Natural Resource Conservation Service. 2009.

Reclamation 2018. Draft 2005-2014 Review of Operating Principles and Project Operations, Trinidad Lake Project, Colorado. Bureau of Reclamation, Eastern Colorado Area Office. Loveland, CO. April 2018.

Reclamation 2010. Final 1995-2004 Review of Operating Principles and Project Operations, Trinidad Lake Project, Colorado. Bureau of Reclamation, Eastern Colorado Area Office. Loveland, CO. September 2010.

Reclamation 2004. Trinidad Dam and Reservoir Project Operating Principles and Operating Criteria Amendment, Final Environmental Assessment. Bureau of Reclamation, Eastern Colorado Area Office. Loveland, CO. November 2004.

NRCS 2018. 2018 Arkansas River Selenium EQIP Sign-up. Natural Resource Conservation Service Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/newsroom/releases/?cid=NRCSEPRD1386011>, accessed on April 6, 2018.

PRWCD 2018. Purgatoire River Water Conservancy District. Website: <http://prwcd.org> Assessed on April 3, 2018.

PWP 2014. Purgatoire River Watershed Plan 2014, Trinidad, Colorado. Purgatoire Watershed Partnership.

Reclamation 1951. Trinidad Project, Agricultural Economy. U.S. Bureau of Reclamation.

Trinidad 2012. Water Conservation Plan, City of Trinidad, Colorado. Prepared by RJH Consultants, Inc., June 2012.

US Census 2018. Current Estimates Data and QuickFacts, Las Animas County, Colorado. United States Census Website: <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>, and <https://www.census.gov/quickfacts/fact/table/lasanimascountycolorado/PST045216> accessed April 2 and 5, 2018.

USDA 2012. 2012 Census of Colorado, County Profile, Las Animas County, Colorado. U.S. Department of Agriculture Website: https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Colorado/cp08071.pdf, accessed on April 5, 2018.

USFS 2018. Chronological History of National Grasslands, U.S. Forest Service Website: https://www.fs.usda.gov/detail/psicc/about-forest/districts/?cid=fsm9_032702, accessed on April 4, 2018.

USFWS 2018. Letter from U.S. Fish and Wildlife Service, Colorado Ecological Services Field Office for List of threatened and endangered species. Consultation Code: 06E24000-2018-SLI-0839. April 5, 2018.

Wheeler and Assoc. 2018. Calculation of Proposed Volumetric Limits for City of Trinidad's Proposed Amendment to the Operating Principles. Prepared by Gary Thompson, W.W. Wheeler and Associates, Inc., April 10, 2018.

APPENDIX A

PROPOSED CONTRACT AMENDMENT NO. 2 BETWEEN THE UNITED STATES OF AMERICA AND THE PURGATOIRE RIVER WATER CONSERVANCY DISTRICT

**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Trinidad Project, Colorado**

**CONTRACT AMENDMENT NO. 2
BETWEEN
THE UNITED STATES OF AMERICA
AND
THE PURGATOIRE RIVER WATER CONSERVANCY DISTRICT**

THIS CONTRACT AMENDMENT, made this ____ day of _____, _____, pursuant to the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof and supplementary thereto, particularly, but not limited to, Section 9(d) of the Act of August 4, 1939 (53 Stat. 1187), as amended and supplemented, and the Act of July 3, 1958 (72 Stat. 297), as amended by the Act of October 27, 1965, P.L. 89-298 (79 Stat. 1073-1096), all collectively referred to as the Federal Reclamation Laws, is between the UNITED STATES OF AMERICA, hereinafter referred to as the “United States,” represented by the Contracting Officer executing this Amendment, and the PURGATOIRE RIVER WATER CONSERVANCY DISTRICT, hereinafter referred to as the “District” or “Contractor,” and collectively referred to as “the Parties.”

WITNESSETH:

EXPLANATORY RECITALS

The following statements are made in explanation:

- a. WHEREAS, the United States and the District executed Contract No. 7-07-70-W0095 (formerly Contract No. 14-06-700-6279) on February 10, 1967, which was subsequently amended by Amendment No. 1 dated August 1, 1986, and which was further clarified by a Contract Administrative letter concurred to by the District and the City of Trinidad dated September 20, 2007, hereinafter called the Existing Contract; and
- b. WHEREAS, House Document 325, 84th Congress, 2nd Session (1956) authorized a maximum repayment period of 75 years and payment commenced in 1985; and
- c. WHEREAS, the Existing Contract has a repayment period of 70 years; and
- d. WHEREAS, the Existing Contract allows the City of Trinidad use of a portion of the water; and

e. WHEREAS, the Existing Contract requires the City of Trinidad to pay interest on the water used for municipal and industrial purposes but needs clarification regarding the definition of headgate diversions in Article 6 to ensure that both the irrigation and municipal and industrial water is included within the payment calculation; and

f. WHEREAS, operating principles are attached to the Existing Contract as an Exhibit and provide direction for the regulation and storage of the water of the Purgatoire River; and

g. WHEREAS, the District has requested the Existing Contract to be amended to extend the repayment period from 70 to 75 years, and to update the operating principles to allow additional use of water by the City of Trinidad; and

h. WHEREAS, on July 24, 2013, Reclamation Manual Policy PEC P05 established new definitions for irrigation and municipal and industrials uses; and

i. WHEREAS, Article 4.b. of the Existing Contract, provides the effective definition of irrigation in the contract, which is that the District's use of water is only for irrigation, stock-watering, and incidental domestic purposes which is in compliance with the new definitions; and

j. WHEREAS, Reclamation and the Contractor have both interpreted the Existing Contract to allow for use of irrigation water to include but not be limited to, replacement of historical return flow patterns from gravity irrigation to other, more efficient irrigation methods, and for incidental watering for the noncommercial cultivation of crops or pasturing of animals for personal purposes; and

k. WHEREAS, pursuant to Reclamation Manual Policy PEC P10, the standard water related contract articles need to be updated and/or inserted into the Existing Contract to promote efficiency and consistency in the contracting process and contract administration; and

l. WHEREAS, the definition of headgate diversions needs to be clarified to ensure that municipal and industrial water supply is included; and

m. WHEREAS, the Parties agree to amend the Existing Contract to extend the repayment period, update the operating principles, update/insert the standard contract article provisions, and clarify the definition of headgate diversions.

NOW THEREFORE, in consideration of the mutual covenants herein contained, the Parties hereto agree to amend the Existing Contract as follows:

1. Article 2.e. of Amendment No. 1 is hereby deleted in its entirety and replaced with the following:

e. “Lessoning of the repayment obligation shall not be open for negotiation.”

2. General Definitions, Article 1.e. “Operating Principles” is hereby deleted in its entirety and replaced with the following:

e. “Operating principles” shall mean the document entitled “Operating Principles, Trinidad Dam and Reservoir Project” attached hereto as Exhibit A, and hereby made a part of this contract by reference, and the terms defined therein, when used in this contract, shall have the meanings ascribed to them in Exhibit A and no other.”

3. Repayment Obligation, the first sentence of Article 5.b. is hereby deleted in its entirety and replaced with the following:

“The United States Bureau of Reclamation will seek to provide the District with an estimate of the annual construction repayment obligation as fixed in subparagraph a. of this Article by November 30 of each year. The United States Bureau of Reclamation will seek to provide the District with an invoice for the actual annual construction repayment obligation as fixed in subparagraph a. of this Article by December 31 of each year. The District shall pay to the United States Bureau of Reclamation by method of payment of the District’s choice pursuant to Article 29, its annual construction repayment obligation by January 31 of the succeeding year or within 30 days of issuance of invoice, whichever comes later.”

4. Variable Repayment Plan, Article 6.c. is hereby deleted in its entirety and replaced with the following:

“The water supply index factor for the current year shall be determined from the following table:

Effective water supply expressed as %	Water supply index factor
120	3.145
119	3.082
118	3.019
117	2.956
116	2.893
115	2.830
114	2.767
113	2.704
112	2.641
111	2.578
110	2.515

Effective water supply expressed as %	Water supply index factor
109	2.452
108	2.389
107	2.326
106	2.263
105	2.200
104	2.137
103	2.074
102	2.011
101	1.948
100	1.885
99	1.822
98	1.759
97	1.696
96	1.633
95	1.570
94	1.507
93	1.444
92	1.381
91	1.318
90	1.255
89	1.192
88	1.129
87	1.066
86	1.003
85	0.940
84	0.877
83	0.814
82	0.751
81	0.688
80	0.625
79	0.562
78	0.499
77	0.436
76	0.373
75	0.310
74	0.247
73	0.184
72	0.121
71	0.058

“The effective water supply shall be determined by multiplying by 100 the decimal fraction derived from dividing the sum of the headgate diversions by 61,422. The formula thus becomes:

$$\text{“Effective water supply} = \frac{\text{headgate diversions (acre-feet)}}{61,422 \text{ (acre-feet)}} \times 100$$

“(1) Headgate diversions - shall be the total amount of water diverted by all ditch companies including water delivered to the City of Trinidad and Colorado Division of Parks and Wildlife for municipal and industrial use or permanent fishery pool uses. Such headgate diversions shall be measured in acre-feet at the point of diversion from the Purgatoire River by the use of measuring devices which shall have been installed, operated and maintained in conformity with such specifications and standards as may from time-to-time be established by the Secretary and the Colorado State Engineer.”

“(2) 61,422 acre-feet is a negotiated average annual amount of headgate diversions required to provide a 100 % water supply to the District’s 19,499 acres of irrigable lands (3.15 ft. x 19,499 = 61,422 acre-feet).”

5. Variable Repayment Plan, Article 6.f. is hereby amended as follows: The phrase “70-year repayment term” is deleted and changed to “75-year repayment term.”

6. Agreed Charges a General Obligation of the District, Article 11, is hereby deleted in its entirety and replaced with the following:

“GENERAL OBLIGATION—BENEFITS CONDITIONED UPON PAYMENT

“11. a. The obligation of the Contractor to pay the United States as provided in this contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

b. The payment of charges becoming due pursuant to this contract is a condition precedent to receiving benefits under this contract. The United States shall not make water available to the Contractor through Project works during any period in which the Contractor is in arrears for more than 12 months in the payment of any construction charges due the United States. The Contractor shall not deliver water under the terms and conditions of this contract for lands or parties that are in arrears more than 12 months in the payment of construction charges as levied or established by the Contractor.

c. Nothing in this agreement restricts or alters the Contractor’s ability to refuse deliveries of water to Project participants on terms more restrictive than those included in this agreement, including without limitation the

ability to refuse delivery of water to Project participants that are in arrears less than 12 months.”

7. Penalty for Delinquent Payments, Article 13, is hereby deleted in its entirety and replaced with the following:

“CHARGES FOR DELINQUENT PAYMENTS

“13. a. The Contractor shall be subject to interest, administrative, and penalty charges on delinquent payments. If a payment is not received by the due date, the Contractor shall pay an interest charge on the delinquent payment for each day the payment is delinquent beyond the due date. If a payment becomes 60 days delinquent, the Contractor shall pay, in addition to the interest charge, an administrative charge to cover additional costs of billing and processing the delinquent payment. If a payment is delinquent 90 days or more, the Contractor shall pay, in addition to the interest and administrative charges, a penalty charge for each day the payment is delinquent beyond the due date, based on the remaining balance of the payment due at the rate of 6 % per year. The Contractor shall also pay any fees incurred for debt collection services associated with a delinquent payment.

b. The interest rate charged shall be the greater of either the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of 0.5 % per month. The interest rate charged will be determined as of the due date and remain fixed for the duration of the delinquent period.

c. When a partial payment on a delinquent account is received, the amount received shall be applied first to the penalty charges, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.”

8. Amendment or Repeal of Federal Reclamation Laws, Article 18, is hereby deleted in its entirety and replaced with the following:

“COMPLIANCE WITH FEDERAL RECLAMATION LAWS

“18. The parties agree that the delivery of irrigation water or use of Federal facilities pursuant to this contract is subject to Federal reclamation law, including but not limited to the Reclamation Reform Act of 1982 (43 U.S.C 390as, et seq.), as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal reclamation law.”

9. Changes in Organization of District, Article 20, is hereby deleted in its entirety and replaced with the following:

CHANGES IN CONTRACTOR'S ORGANIZATION

“20. While this contract is in effect, no change may be made in the Contractor’s organization, by inclusion or exclusion of lands or by any other changes which may affect the respective rights, obligations, privileges, and duties of either the United States or the Contractor under this contract including, but not limited to, dissolution, consolidation, or merger, except upon the Contracting Officer’s written consent.”

10. Assignment Limited – Successors and Assigns Obligated, Article 21, is hereby deleted in its entirety and replaced with the following:

ASSIGNMENT LIMITED—SUCCESSORS AND ASSIGNS OBLIGATED

“21. The provisions of this contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this contract or any right or interest therein by either party shall be valid until approved in writing by the other party.”

11. Notices, Article 22, is hereby deleted in its entirety and replaced with the following:

NOTICES

“22. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the:

Regional Director
Bureau of Reclamation
Great Plains Region
P.O. Box 36900
Billings, MT 59107-6900

and on behalf of the United States, when mailed, postage prepaid, or delivered to the Contractor:

Purgatoire River Water Conservancy District
3590 East Main Street
Trinidad, CO 81082

The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.”

12. Officials Not to Benefit, Article 28, is hereby deleted in its entirety and replaced with the following:

OFFICIALS NOT TO BENEFIT

“28. No Member of or Delegate to the Congress, Resident Commissioner, or official of the Contractor shall benefit from this contract other than as a water user or landowner in the same manner as other water users or landowners.”

13. Medium for Transmitting Payments, Article 29 is hereby added to the Existing Contract as follows:

MEDIUM FOR TRANSMITTING PAYMENTS

“29. a. All payments from the Contractor to the United States under this contract shall be by the medium requested by the United States on or before the date payment is due. The required method of payment may include checks, wire transfers, or other types of payment specified by the United States.

b. Upon execution of the contract, the Contractor shall furnish the Contracting Officer with the Contractor’s taxpayer’s identification number (TIN). The purpose for requiring the Contractor’s TIN is for collecting and reporting any delinquent amounts arising out of the Contractor’s relationship with the United States.”

14. Exhibit A, Operating Principles is hereby deleted in its entirety and replaced with the attached Amended Operating Principles.

15. Exhibit B, Operating Criteria is hereby deleted in its entirety and replaced with the attached Amended Operating Criteria.

EXISTING CONTRACT TO REMAIN IN EFFECT

16. Except as herein provided, the Existing Contract between the Parties hereto shall remain in full force and effect. This Amendment shall not affect any other Existing Contract terms and conditions in effect at this time.

IN WITNESS WHEREOF, the Parties hereto have signed their names the day and
year
first above written.

THE UNITED STATES OF AMERICA

Michael S. Black
Regional Director
Great Plains Region
Bureau of Reclamation

PURGATOIRE RIVER WATER CONSERVANCY DISTRICT
CONTRACTOR

By: _____

Title: _____

ATTEST:

Secretary (seal)

APPENDIX B

**PROPOSED AMENDMENTS TO THE OPERATING PRINCIPLES FOR THE
TRINIDAD DAM AND RESERVOIR PROJECT**

Summary of Proposed PRWCD Operating Criteria Amendments

- (1) Only water attributable to the historic consumptive use on acreage **removed from irrigation**, limited to ~~948~~ 1171.7 acres under the Johns Flood Ditch system and 373.7 acres under the Model Land and Irrigation Company system, may be made available for M&I storage or **permanent fishery pool** storage. Water deliveries shall be limited to the following volumes, which shall not include the volumes retained in storage for later release to maintain historic delayed return flow patterns to the Purgatoire River:

	Maximum Monthly Water Deliveries (acre-feet)
Apr	220 <u>257</u>
May	345 <u>403</u>
Jun	565 <u>661</u>
Jul	685 <u>801</u>
Aug	620 <u>725</u>
Sep	325 <u>403</u>
Oct	460 <u>187</u>
Nov - Mar	0
Annual Total	2,802 <u>3,276</u>

EXHIBIT A to ARCA
Resolution 2014 - 3

Redline-Strikeout of Amended Table on Page 8 of the Operating Criteria

OPERATING PRINCIPLES
TRINIDAD DAM AND RESERVOIR PROJECT

AMENDED 2018

Preamble

The Trinidad Dam and Reservoir Project as reported in House Document No. 325, 84th Congress, 2d Session, and as authorized by the Flood Control Act of 1958, will be operated in such a manner as to secure the greatest practicable benefits from the regulation and use of the flows of the Purgatoire River consistent with the laws and policies of the State of Colorado and of the United States including the Arkansas River Compact. The objectives and principles governing the operation of the Trinidad Dam and Reservoir Project to secure such benefits are contained within the following articles.

- Article I - OBJECTIVES
- Article II - DEFINITION OF TERMS
- Article III - FLOOD CONTROL
- Article IV - IRRIGATION, MUNICIPAL AND INDUSTRIAL
- Article V - FISHERY AND RECREATION
- Article VI - REVIEW AND AMENDMENT

Article I - OBJECTIVES

The operation of the Trinidad Dam and Reservoir involves the regulation of the flows of the Purgatoire River for flood control, irrigation use, municipal and industrial use and recreation, including a permanent fishery pool. The project plan provides for:

1. Control of floods originating above the reservoir for benefit of the City of Trinidad and downstream reaches.
2. Optimum beneficial use of the available water for irrigation and municipal and industrial uses (municipal and industrial hereinafter abbreviated M&I) within the project area consistent with the protection of downstream non-project rights as set forth in House Document No. 325, 84th Congress, 2d Session, which provides:
 - (a) Transfer of the storage decree of The Model Land & Irrigation Company for 20,000 acre-feet annually from the present site to the proposed Trinidad Reservoir.
 - (b) Storage in the Trinidad Reservoir of flood flows originating on the Purgatoire River above the dam, which would otherwise spill from John Martin Reservoir.

- (c) Storage in Trinidad Reservoir of the winter flows of the Purgatoire River historically diverted for winter irrigation of project lands.
- 3. The maintenance of a minimum pool for enhancement of recreation and fishery values.
- 4. The construction of the Trinidad Dam and Reservoir with the following allocated capacities:

Flood Control.....	51,000 acre-feet
Irrigation and M&I.....	20,000 acre-feet
Permanent fishery pool	15,967 acre-feet
Joint use *	<u>39,000</u> acre-feet
Total capacity.....	125,967 acre-feet

* For irrigation, M&I and sediment accumulation.

Article II – DEFINITION OF TERMS

Definition of terms as used herein:

- 1. **“Colorado State Engineer”** means the **Colorado State Engineer** or such other administrative agency having jurisdiction and control over the distribution of the waters of the State of Colorado.
- 2. **“District”** means the Purgatoire River Water Conservancy District, that entity created and existing under laws of the State of Colorado to contract for repayment to the United States of an appropriate share of the project costs allocated to the irrigation and M&I use. The **District** shall also be the agency responsible for the regulation of irrigation and M&I water supplies within the **District** boundaries in the manner set forth therein.
- 3. **“District Irrigable Area”** means only 19,499 acres of the contracted lands lying within the **District** Boundaries.
- 4. **“District Storage Right”** means those rights under which the **District** may store water in the **irrigation capacity** for use within the **District**.
- 5. **“District Water Supply”** means that water supply of the Purgatoire River subject to **District** administration for irrigation and M&I use within the **District**, and which may be used to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose.

6. **"Flood Control"** means the temporary storage of flood waters at any **reservoir** pool level as necessary to alleviate flood damages through the City of Trinidad and downstream reaches.
7. **"Flood Control Capacity"** means the 51,000 acre-feet of capacity exclusively allocated to **flood control** lying initially above m.s.l. **reservoir** elevation 6,229.6.
8. **"Irrigation Capacity"** means the 20,000 acre-feet of reservoir capacity allocated to irrigation and M&I use plus the unsedimented portion of the joint use capacity, and which may be used to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose. Use of the **irrigation capacity** to replace evaporation and seepage from the **permanent fishery pool** shall not diminish the payment of the annual construction charge by the **District** pursuant to Contract No. 7-07-70-W0095, as amended, between the **District** and the United States.
9. **"Irrigation Season"** means that period of the year, as determined annually by the **District**, during which water may be beneficially applied to the **District irrigable area**, less those lands **removed from irrigation**, provided the **irrigation season** will not begin earlier than April 1 or end later than October 15, except as modified by the **District** with the consent of the Secretary of Interior.
10. **"Non-Irrigation Season"** means that period of the year other than the **irrigation season**.
11. **"Operating Agency"** means the U.S. Army Engineer District, Albuquerque, New Mexico, Corps of Engineers.
12. **"Permanent Fishery Pool"** means the quantity of water stored in the **Permanent Fishery Pool Capacity**.
13. **"Permanent Fishery Pool Capacity"** means the 15,967 acre-feet of **reservoir** capacity allocated to fishery and recreation.
14. **"Removed from irrigation"** means **District irrigable area** for which the associated consumptive use has been changed from **irrigation** to another type of use by decree or approval of the State Engineer.
15. **"Reservoir"** means the reservoir presently planned and authorized for construction on the Purgatoire River above the City of Trinidad, Colorado.

16. **“Reservoir Inflow”** is to be expressed in mean daily cubic feet per second of time and means that total flow of water entering the **reservoir** comprising of measured flows at the inflow gaging stations and other unmeasured inflows entering the reservoir, less such flow of water as may be acquired and imported into the Arkansas River Basin by the State of Colorado for filling and maintaining the **permanent fishery pool**.
17. **“Unused Sediment Capacity”** means that portion of the 39,000 acre-feet of **reservoir** capacity allocated to joint use but unoccupied by sediment at any given time.

Article III - FLOOD CONTROL

Trinidad Reservoir shall be operated for **flood control** benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles:

1. All potentially damaging flood inflows shall be temporarily detained as necessary to limit the flow insofar as possible to a non-damaging flow, currently estimated to be 5,000 c.f.s., downstream from the Trinidad Reservoir.
2. All flood water stored in the **flood control capacity** shall be released at the maximum non-damaging rate insofar as practicable.
3. Any inflow, other than that stored for irrigation and M&I and **permanent fishery pool** use, temporarily retained below the bottom of the **flood control capacity** for **flood control** purposes, shall be released by the **operating agency** at such a rate, time, and quantity as may be ordered by the **Colorado State Engineer**, but within non-damaging flow in the channels below the **reservoir**.

ARTICLE IV– IRRIGATION, MUNICIPAL AND INDUSTRIAL

Administration of the **irrigation capacity** in Trinidad Reservoir and the distribution of water to the **District irrigable area**, to M&I uses within the **District**, and to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose, will be made by the **District** in accordance with House Document No. 325, 84th Congress, 2d Session, and these operating principles. Agreements, satisfactory to the Secretary of the Interior, shall be entered into between the **District** and the ditch companies and other owners of affected water rights to insure that these principles and the operation described herein shall be adopted.

The principles and provisions under which the **District** will administer water supplies to the **District irrigable area**, to M&I uses within the **District**, and to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose, are contained in the following four parts of this Article:

“Water Rights,” “Limits of Land and Water Use,” “**District Water Supply**,” and “Operation and Exercise of Water Rights.”

A. Water Rights

Accomplishment of the following conditions is necessary under the laws of the State of Colorado to provide the **District** with the right to regulate the flows of the Purgatoire River in the manner described herein:

1. The water users within the **District** shall assign the right to the exercise of all the decreed direct flow water rights within the **District** boundaries to the **District** for administration by the **District** at such times and to the degree outlined in these principles. The right to the exercise of the following water rights, all in Water District No. 19, shall be so assigned.

Direct Flow Rights
Water Division No. 2

<u>Number</u>	<u>Priority Date</u>	<u>Contracted Amount (cfs)</u>	<u>Contracting User</u>
3	11/30/1861	4.00	Baca
3	11/30/1861	2.00	Chicosa, Lujan & Northside
5	03/20/1862	4.00	Johns Flood
7	04/30/1862	7.00	Chilili
8	11/15/1862	1.55	El Moro Water Users
8	11/15/1862	2.18	El Moro
9	01/01/1863	1.28	Johns Flood
9	01/01/1863	4.72	Hoehne
12	06/30/1863	0.50	Enlarged South Side
13	01/01/1864	1.25	Johns Flood
13	01/01/1864	3.75	R. Lacy
15	04/10/1864	5.10	Johns Flood
15	04/10/1864	0.80	Hoehne
15	04/10/1864	0.847	R. Lacy
19	06/01/1865	4.00	R. Lacy
20	10/07/1865	7.35	Johns Flood
20	10/07/1865	16.65	Hoehne
21	01/01/1866	3.25	R. Lacy
22	02/01/1866	1.34	R. Lacy
27	05/31/1866	2.25	Johns Flood
27	05/31/1866	0.75	R. Lacy
40	04/30/1868	1.40 ¹	Enlarged South Side

¹ 0.77 cfs abandoned, 0.63 cfs remains

<u>Number</u>	<u>Priority Date</u>	<u>Contracted Amount (cfs)</u>	<u>Contracting User</u>
64	04/01/1873	2.40	Johns Flood
73	11/01/1875	6.00	Enlarged South Side
74	02/17/1876	34.00	Enlarged South Side
75	12/25/1876	4.00	Enlarged South Side
77	03/11/1877	1.30	El Moro
77	03/11/1877	2.70	El Moro Water Users
80	04/07/1877	18.60	Enlarged South Side
93	12/15/1882	4.00	Enlarged South Side
95	11/04/1883	14.39	Chicosa, Lujan & Northside
96	11/23/1883	16.84	Enlarged South Side
98	04/30/1884	60.00	Enlarged South Side
103	06/21/1886	14.73	Chicosa, Lujan & Northside
104	10/21/1886	10.00	R. Lacy
106	03/12/1887	15.00	Chicosa, Lujan & Northside
108	02/15/1888	9.70	Enlarged South Side
109	03/01/1888	8.00	Enlarged South Side
145	10/20/1902	100.00	Johns Flood
168	01/22/1908	200.00	Model
242 ½	06/12/1920	45.56	Chicosa, Lujan & Northside

2. Waters of the Purgatoire River shall be stored by the **District** in the **irrigation capacity** of Trinidad Reservoir under rights created under Colorado law; said rights, defined as the **District storage right**, include:
 - a) The Model storage right, being the right to store 20,000 acre-feet of water from the flows of the Purgatoire River, under reservoir priority No. 10 in Water District No. 19 at a rate of flow not exceeding 700 cubic feet per second of time under date of appropriation of January 22, 1908, as decreed by the District Court of Las Animas County, Colorado, on January 12, 1925, which right shall, by appropriate statutory proceedings be transferred from the place of storage as originally decreed to the site of the **reservoir**; and
 - b) Such other rights to store water in the **reservoir** as the **District** may lawfully acquire by appropriation or purchase.

B. Limits of Land and Water Use

In order that the Trinidad Dam and Reservoir Project may provide an optimum beneficial use of water for irrigation, and M&I uses within the **District**, and to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose, the following limitations on land and water use shall apply:

1. The acreage irrigated by the **District water supply** shall be limited to the **District irrigable area**, less those lands **removed from irrigation**. The **District irrigable area** shall be composed as nearly as practicable of the acreage identified in contracts with the **District** under individual ditches:

Picketwire	2,414.7 acres
Baca	319.6 acres
Chilili	300.0 acres
El Moro	176.9 acres
Johns Flood	2,170.7 acres
Model	7,028.8 acres
Enlarged South Side	6,299.6 acres
Hoehne	1,200.0 acres
Burns & Duncan	229.7 acres
Lewelling & McCormick	467.9 acres

a total of 20,607.9 contract acres.

2. The **District** shall provide notice each year, prior to June 1, to the State of Kansas, the Bureau of Reclamation, and other parties making a written request, of lands expected to be irrigated. Such notice shall include a map and a tabulation of said lands, both showing tracts, their acreage and location. Any interested party may conduct field inspections related to the **District irrigable Area**, and the **District** shall cooperate with the party in the conduct of such inspections.

The **District** shall implement substantive procedures to verify each year that no more than the **District Irrigable Area**, less lands **removed from irrigation**, are irrigated in that year. The **District** shall prepare a report each year including a tabulation showing tracts, acreage and location of lands irrigated in that year. The **District** shall provide the report to the State of Kansas, the Bureau of Reclamation, and other parties making a written request, by February 1 of the following year.

3. All water deliveries to the **District irrigable area**, less those lands **removed from irrigation**, will be limited during the **irrigation season** to the irrigation requirements at the farm headgate as determined by the **District**. Allowance for

canal and lateral losses on the individual ditch systems will be determined by the **District**.

4. Water deliveries may be diverted or stored for M&I or **permanent fishery pool** purposes with the following limitations:

(a) Conditions applicable to the City of Trinidad:

(1) Only water attributable to the historic consumptive use on acreage **removed from irrigation**, limited to 1,171.7 acres under the Johns Flood Ditch system and 373.7 acres under The Model Land & Irrigation Company system may be made available for M&I storage or **permanent fishery pool** storage. Water deliveries shall be limited to the following volumes, which shall not include the volumes retained in storage for later release to maintain historic delayed return flow patterns to the Purgatoire River:

	Maximum Monthly Water Deliveries (acre-feet)
Apr	257
May	403
Jun	661
Jul	801
Aug	725
Sep	403
Oct	187
Nov - Mar	0
Annual Total	3,276

(2) Water attributable to historic return flows associated with the exercise of the water rights used on the acreage **removed from irrigation** shall be released in such a manner as to maintain the historic return flow patterns to the Purgatoire River. Such return flows, which shall include **non-irrigation season** return flows, shall be equal to at least 35 percent of the water available to acreage **removed from irrigation**.

(3) Removal of **District** irrigable land from irrigation to enable water to be diverted or stored for M&I or **permanent fishery pool** purposes shall correspondingly reduce the number of acres allowed to be irrigated from the **District water supply**. Prior to April 1 each year, the City of Trinidad shall provide notice to the

Arkansas River Compact Administration and the State of Kansas of the acreage to be removed each year corresponding to the amount of water for the Johns Flood Ditch and the Model ditch to be stored in Trinidad Reservoir for that year. The report shall include a map indicating the specific acreage to be **removed from irrigation**.

- (4) Any Colorado state court or administrative approval of the City of Trinidad’s water use covered by these Operating Principles shall require compliance herewith.
- (b) Conditions applicable to the State of Colorado, Department of Natural Resources, Colorado Division of Parks and Outdoor Recreation:
 - (1) Only water attributable to the historic consumptive use on acreage **removed from irrigation**, limited to 805.46 acres under The Model Land and & Irrigation Company system, may be made available from the **irrigation capacity** for replacement of evaporation and seepage from the **permanent fishery pool**. Water deliveries shall be limited to the following volumes, which shall not include the volumes retained in storage for later release to maintain historic delayed return flow patterns to the Purgatoire River:

	Maximum Monthly Water Deliveries (acre-feet)
Apr	135
May	210
Jun	345
Jul	420
Aug	380
Sep	210
Oct	95
Nov - Mar	0
Annual Total	1,708

- (2) Water attributable to historic return flows associated with the exercise of the water rights used on the acreage **removed from irrigation** shall be released in such a manner as to maintain the historic return flow patterns to the Purgatoire River. Such return flows, which shall include **non-irrigation season** return flows,

shall be equal to at least 35 percent of the water available to acreage **removed from irrigation**.

- (3) Removal of **District** irrigable land from irrigation to enable water from the **irrigation capacity** to be used for replacement of evaporation and seepage from the **permanent fishery pool** shall correspondingly reduce the number of acres allowed to be irrigated from the **District water supply**. Prior to April 1 each year, the Colorado Division of Parks and Outdoor Recreation shall provide notice to the **District**, the Arkansas River Compact Administration and the State of Kansas of the acreage to be removed each year corresponding to the amount of water for the Model Ditch to be stored in Trinidad Reservoir for that year. The report shall include a map indicating the specific acreage to be **removed from irrigation**.
 - (4) Any Colorado state court or administrative approval of the State of Colorado, Department of Natural Resources, Colorado Division of Parks and Outdoor Recreation water use covered by these Operating Principles shall require compliance herewith.
5. No water deliveries for irrigation of the **District irrigable area**, less those lands **removed from irrigation**, will be made during the **non-irrigation season**. Water may be released during the **non-irrigation season** for M&I use or to maintain historic return flow patterns for lands **removed from irrigation**.

C. District Water Supply

1. That water supply of the Purgatoire River subject to **District** administration for irrigation and M&I use within the **District**, and to replace evaporation and seepage from the **permanent fishery pool** if rights to water stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose, defined as the **District water supply**, consists of:
 - (a) The water stored under the **District storage right** in the **irrigation capacity**.
 - (b) The stream gains to the Purgatoire River below Trinidad Dam that are divertible to the **District irrigable area**, less those lands **removed from irrigation**, for irrigation use through the **District's** exercise of the water rights listed in IV.A.1.
 - (c) That portion of the **reservoir inflow** at Trinidad Dam which is available to the **District** through the **District's** exercise of the water rights listed in IV.A.1.

2. The **District water supply** will be allocated by the **District** to the ditches within the **District** to provide each acre of the **District irrigable area**, less those lands **removed from irrigation**, an equitable share of the **District water supply** after allowance has been made for individual ditch transportation losses, provided such allocation will not exceed the irrigation requirements at the farm headgate.

D. Operation and Exercise of Water Rights

The principles governing operation of the **irrigation capacity** and the **District's** exercise of the assigned direct flow water rights listed under IV.A.1. and the **District storage right** are hereinafter set forth as they apply to operations during the entire year as well as to operations during either the **non-irrigation season** or **irrigation season**.

1. Non-interference with Downstream Water Rights

- (a) Bypasses to the river shall be made at any time during the year to satisfy downstream senior rights as ordered by the **Colorado State Engineer** to the extent that such demands are not met by stream gains or otherwise satisfied; but are limited to the extent as determined by the **Colorado State Engineer** to actually benefit such rights without unnecessary waste through channel losses.
- (b) **Reservoir inflow** in excess of the amount stored under the transferred Model right may be detained in the **reservoir** at such times as John Martin Reservoir is reasonably expected to spill; to the extent that John Martin Reservoir would have spilled, such detained water shall be considered to have been stored under the **District storage right** and become part of the **District water supply**. Such detained water which does not become a part of the **District water supply** shall be released as called for by the **Colorado State Engineer** in the amounts and at such times as he shall determine that such releases may be required to avoid a material depletion of the water of the Arkansas River as defined in Article 3 of the Arkansas River Compact C.R.S., 1953, 148-9-1.
- (c) Except as provided by paragraph (b) above, any water temporarily detained in the **reservoir** as a result of the **reservoir inflow** exceeding the design outlet capacity of the **reservoir** shall be released as soon as possible.
- (d) All releases from the **reservoir** as set forth in (a), (b) and (c) above, shall be passed down the Purgatoire River without interference by water users in the **District irrigable area**.

2. District Operation, Non-Irrigation Season

- (a) During the **non-irrigation season** the **District** may provide an annual allowance for stock watering purposes of not more than 1,200 acre feet measured at the headgates of Project ditches. If the stream gains below the Trinidad Dam are insufficient to fulfill this allowance, water may be released from the reservoir at any rate within the parameters of the Water Control Manual as needed to efficiently satisfy stock water demands within the allowance. Any water accumulated but not released for stock watering purposes as of April 1 shall be accounted as part of the annual **District storage right**.
- (b) During the **non-irrigation season**, the **District** shall release water stored by the City of Trinidad as designated by the City of Trinidad for:
 - (1) M&I purposes;
 - (2) Winter return flows.
- (c) During the **non-irrigation season**, the **District** shall release water controlled by the Colorado Division of Parks and Outdoor Recreation as designated by the Colorado Division of Parks and Outdoor Recreation for winter return flows.
- (d) During the **non-irrigation season**, the **District** will exercise the direct flow water rights and the **District storage right** only at such times and to the degree as necessary to assure:
 - (1) That the maximum possible storage of **reservoir inflow** is accrued.
 - (2) The stock water allowance is distributed in a manner determined equitable by the **District**.

3. District Operation - Irrigation Season

- (a) During the **irrigation season**, except at such times as provided for in IV.D.3.(c) below, the **District** shall exercise the direct flow water rights and the **District storage right** only at such times and to the degree necessary to assure:
 - (1) That stream gains to the river below Trinidad Dam which are divertible to the **District irrigable area**, less those lands **removed from irrigation**, and such **reservoir inflow** which is available to the **District** for irrigation and M&I use, and to replace evaporation and seepage from the **permanent fishery pool** if rights to water

stored in the **irrigation capacity** are acquired by the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation, for such purpose, will be equitably allocated to the **District irrigable area**, less those lands **removed from irrigation**, as part of the **District water supply**.

- (2) That the **District storage right** can be fully exercised to store **reservoir inflow** in excess of that bypass to the river as may be required under D.1.(a) and D.3.(a) (1) above.
- (b) During the **irrigation season**, water stored in the **irrigation capacity** will be released as needed to fulfill or partially fulfill the irrigation requirements of the **District irrigable area**, less those lands **removed from irrigation**, or as designated by the City of Trinidad, made available for M&I purposes or the **permanent fishery pool** as provided in paragraph IV.B.4.(a) above, or as designated by the Colorado Division of Parks and Outdoor Recreation, used for replacement of evaporation and seepage from the **permanent fishery pool** as provided in paragraph IV.B.4.(b) above.
- (c) During the **irrigation season**, when the **irrigation capacity** is empty as determined by the **District**, the **District** will relinquish its exercise of the direct flow water right provided that if the **reservoir inflow** and stream gains below Trinidad Dam which are divertible to the **District irrigable area**, less those lands **removed from irrigation**, exceed the irrigation requirement and such excess is storable under the **District storage right**, the **District** will resume the exercise of the direct flow rights and exercise of the **District storage right** as in D.3.(a) (2) above.

4. Evaporation and Seepage Losses

In the accounting for water in storage, evaporation and seepage losses due to water stored in the **irrigation capacity** shall be determined using the most recent data available by the **Colorado State Engineer** and the **District** with the cooperation of the **operating agency**.

Article V - FISHERY AND RECREATION

The **permanent fishery pool** shall be operated in accordance with the following principles:

1. Water for the initial filling and for replacing evaporation and seepage losses will be acquired by the State of Colorado without interference to the **District water supply** or without interference to usable Stateline flows, or without additional cost to the **District** or the United States for the Trinidad Project as envisioned in House Document No. 325. In the specific case of the 11,467 acre-feet allocated

to the **permanent fishery pool** pursuant to the Final Environmental Assessment for Revision of the Water Control Manual to Allocate Excess Storage in Trinidad Lake, Las Animas County, Colorado, U.S. Army Corps of Engineers, dated September 1994, the initial filling shall only be made using waters imported into the Arkansas River basin from other river basins, either by direct importation or by exchange pursuant to the laws of Colorado. The initial filling and the replacement of evaporation and seepage shall be made according to the following procedures:

- (a) All water rights on the Purgatoire River downstream of Trinidad Reservoir will be satisfied during the period of any exchange;
- (b) Prior to any exchange, the specific source of imported or native water, as limited by the Operating Principles for Trinidad Dam and Reservoir Project, as amended, will be verified by the **Colorado State Engineer**;
- (c) For each acre-foot of native water stored in Trinidad Reservoir by exchange, the Colorado Division of Parks will deliver an acre-foot of identifiable imported water, or native water whose consumptive use has been determined by final decree of the Colorado Water Court, to the Arkansas River at the Las Animas gaging station;
- (d) Transit losses between the source of supply for an exchange and the Las Animas gage will be determined and assessed by the **Colorado State Engineer**, using the "Livingston Method" or other suitable means, to assure that a "one for one" exchange is accomplished.

The **Colorado State Engineer** will report and account contemporaneously and annually to the Arkansas River Compact Administration on the initial filling and replacement of evaporation and seepage in the **permanent fishery pool**.

2. The State of Colorado, Department of Natural Resources, Colorado Division of Parks and Outdoor Recreation, may acquire the rights to and use water stored in the **irrigation capacity** for the purpose of **permanent fishery pool** so long as the requirements of paragraph IV.B.4.(b) above are followed.
3. In the accounting for water in storage, evaporation and seepage losses due to the **permanent fishery pool** shall be determined using the most recent data available by the **Colorado State Engineer** and the **District** with the cooperation of the **operating agency**.
4. There shall never be any release or transfer of water from the **permanent fishery pool** excepting by necessity of dam safety or flood emergency operations as determined by the Corps of Engineers, District Engineer.

Article VI - REVIEW AND AMENDMENT

These Operating Principles may be subject to review and amendment not more than once a year at the request of any of the parties' signatory; provided, that at least one review shall be accomplished within the first 10 years following completion of the Trinidad Dam and at least one review shall be accomplished every 10 years thereafter. The primary object of such reviews will be obtaining optimum beneficial use of water as conditions change, operating experience is gained, and more technical data become available.

FIVE CONDITIONS

State of Kansas

1. All inflows over established Colorado water rights (1,156.05 c.f.s.) be designated flood flows and released as promptly as downstream conditions permit. The only time water so designated may be stored in the conservation pool will be when John Martin Reservoir does not have the capacity to store additional water.
2. Any subsequent amendment of the Operating Principles should be subject to review and approval of the same interests as provided for in the original procedure.
3. Assurances that there will be no significant increase in water use, which would result in a depletion of water yield to other Colorado and Kansas water users.
4. That 5 years after beginning operation of the Trinidad Reservoir for irrigation purposes, the Operating Principles be reviewed to determine the effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary. Each 10 years thereafter, reviews should be provided with amendments as needed.
5. All operating records be open for inspection by any qualified representative of the Arkansas River Compact Administration.

The Bureau of Reclamation concurs fully with the "Operating Principles" as set forth above, and further agrees with the five conditions noted and suggested by the State of Kansas, also stated above.

OPERATING PRINCIPLES
TRINIDAD DAM AND RESERVOIR PROJECT
2018 AMENDMENTS APPROVED

James Rizzuto
Chairman
Arkansas River Compact Administration

Date

Jeff Colyer, M.D.
Governor
State of Kansas

Date

Ralph Gagliardi
President
Purgatoire River Water Conservancy District

Date

Larry D. Caswell, Jr.
Lieutenant Colonel, U.S. Army
District Commander
USACE, Albuquerque District

Date

Michael S. Black
Regional Director
Great Plains Region
Bureau of Reclamation

Date

Summary of Proposed PRWCD Operating Criteria Amendments

Summary of Proposed PRWCD Operating Criteria Amendments

APPENDIX C

**PROPOSED AMENDMENTS TO THE PURGATOIRE RIVER WATER CONSERVANCY
DISTRICT OPERATING CRITERIA**

Summary of Proposed PRWCD Operating Criteria Amendments

- a. Amend Part A. 3 “Model Account” definition to include “*other District Irrigable Areas with the consent of the Model Land & Irrigation company pursuant to Part B (12)*”;
- b. Amend Part A. 5 “Project Account definition to include a footnote as follows: “*The Project Account may include subaccounts for accounting purposes to replicate historic return flow patterns on lands “removed from irrigation” as that term is defined in the General Operating Principles, consistent with these Operating Criteria.*”;
- c. Amend Part A.10 “State Parks Account” definition to include a footnote as follows: “*The State Parks Account may include subaccounts for accounting purposes to implement the Ruling and Decree of the Water Court issued in Case No. 03CW108 District Court, Water Division No. 2 consistent with these Operating Criteria.*”;
- d. Amend Part B. 5c, 5d, & 5e to include the following: “*subject to the requirements of the rulings in Case No. 86CW025, District Court, Water Division No. 2.*”;
- e. Amend Part B.8a(1) decreasing the amount that may be transferred to the permanent fishery pool capacity or State Parks Account for immediate storage from “0.65” to “0.64” acres feet and “65” to “64” percent.;
- f. Amend Part B.8a to include the following: “*4) 0.01 acre-feet (1 percent) shall be transferred to a subaccount of the State Parks account for purposes of replacing evaporation from the State Parks subaccount during storage and replacing transit losses associated with the delivery of said delayed return flows. Any water that is transferred to the State Parks subaccount that is not needed to replace such evaporative and transit losses may subsequently be transferred to the Permanent Fishery Pool.*”;
- g. Amend Part B.9 to include a, b & c and delete the following text: “*and except for that water in State Parks account as set forth in Part A.10, which has been made available for use by State Parks as specified in Part B.8.*”, and add “*(b) except for that water in the State Park account as set forth in Part A.10, which has been made available for use by State Parks as specified in Part B.8 above; and*” and “*(c) except for water stored for release during the non-irrigation season to maintain historical return flow patterns for lands “removed from irrigation” as that term is defined in the General Operating Principles, subject to compliance with the Operating Principles.*”;
- h. Amend Part E.1 to include the following; “*and water stored for release during the non-irrigation season to maintain historical return flow patterns for lands “removed from irrigation” as that term is defined in the General Operating Principles, subject to compliance with the Operating Principles.*”;
- i. Amend Part F by deleting “*during the development period of the Trinidad Dam and Reservoir Project and*” and “*thereafter*”, and replacing with “*shall be*”; and
- j. Correct other minor typographical errors, punctuation, and spacing.

PURGATOIRE RIVER WATER CONSERVANCY DISTRICT
OPERATING CRITERIA

AMENDED AND RESTATED 2018

These Operating Criteria set forth in detail the criteria governing the **District's** administration of the **District** water supply in conformity with the general principles and provisions contained in the "Operating Principles - Trinidad Dam and Reservoir Project." The **District** shall be responsible for administering the delivery of the **District water supply** for municipal and industrial uses, and the irrigation of the **District irrigable area** in accordance with these Operating Criteria and the above mentioned **general Operating Principles**.

Agreements, satisfactory to the Secretary of the Interior, shall be entered into between the **District** and the ditch companies and other owners of affected water rights to insure that these criteria and the operation described herein shall be adopted. In order that the repayment ability of the **District** will not be impaired, such agreements shall include provision for differential water charges within the **District irrigable area** reflecting payment capacities by land classes and variation in benefits accruing to each ditch system.

The details of the Operating Criteria are contained in the following five parts:

- Part A – "Definitions"
- Part B – "Allocations"
- Part C – "Operations"
- Part D – "Evaporation and Seepage"
- Part E – "Exercise of Water Right"

Provisions for review and amendment of these Operating Criteria are contained in the following part: Part F – "Review and Amendment."

Part A - Definitions

The definition of terms as used in the "Operating Principles - Trinidad Dam and Reservoir Project" applies in these criteria in addition to the following definitions as used herein:

1. **"General Operating Principles"** means the current Operating Principles - Trinidad Dam and Reservoir Project.
2. **"Model Space Reservation"** means the 6,000 acre-feet of space reserved within the **irrigation capacity** of Trinidad Reservoir for storing water, as available, for the use of the Model Land & Irrigation Company, the City of Trinidad, and **State Parks**.
3. **"Model Account"** means the quantity of water in storage within the **Model space reservation** which will be used exclusively for diversion to Model lands and other District Irrigable Areas with the consent of the Model Land & Irrigation Company pursuant to Part B (12), and for municipal and industrial use by the City of Trinidad and State Parks.
4. **"Municipal and Industrial Use"** (sometimes referred to as **"M&I Use"**) means all municipal uses, such as, but not by way of limitation, domestic, commercial, manufacturing, industrial, agricultural, watering of parks and lawns and gardens, fire protection, generation or electric power and power generally, recreation, fish and wildlife

propagation, sewage treatment, street sprinkling, maintenance of adequate storage reserves, maintenance of the **permanent fishery pool**, evaporation replacement, other replacement, augmentation for all beneficial uses, and exchange.

5. **"Project Account"** means the quantity of water in storage within the **irrigation capacity** of Trinidad Reservoir, other than that in the **Model account**.¹

6. **"Trinidad Delayed' Return Flow Account"** means water stored in any space reserved for storage by the City of Trinidad and dedicated for delayed return flows that the City of Trinidad is obligated to release. The **Trinidad delayed return flow account** may be used and may carry over storage from year to year but may not be used so as to impair the **District water supply** in subsequent years as stated in the contract between the City of Trinidad and the **District** dated April 20, 1966, and as interpreted and agreed to in the stipulation entered into in Case No. 86CW39, District Court, Water Division No. 2, State of Colorado.

7. **"Trinidad Storage Account"** means water stored in any space reserved for storage by the City of Trinidad, including storage available to the City of Trinidad pursuant to the provisions of an agreement dated April 20, 1966 between the City of Trinidad and the **District**. The **Trinidad storage account** may carryover storage from year to year and may be used to store transmountain water, but may not be used so as to impair the **District water supply** in subsequent years as stated in the contract between Trinidad and the District dated April 20, 1966 and as interpreted and agreed to in the stipulations between Trinidad and the District, entered into in Case No. 86CW39, District Court, Water Division No. 2, State of Colorado.

8. **"Transferred Model Right"** means the Model storage right of 1908 which has been transferred from its original site and owner to Trinidad Reservoir and the District and made part of the **District storage right**.

9. **"State Parks"** means the State of Colorado, Department of Natural Resources, Division of Parks and Outdoor Recreation.

10. **"State Parks Account"** means water stored in any space reserved or leased for storage by **State Parks** and dedicated for delayed return flows that **State Parks** is obligated to release and for carry-over of **State Parks'** portion of consumable water credits from the change of the water rights of the Model Land & Irrigation Company and for replacement of evaporation and seepage from the **permanent fishery pool**. The **State Parks account** may not be used so as to impair the **District water supply** in subsequent years.²

¹ The Project Account may include subaccounts for accounting purposes to replicate historic return flows patterns on lands "removed from irrigation" as that term is defined in the General Operating Principles, consistent with these Operating Criteria.

² The State Parks Account may include subaccounts for accounting purposes to implement the Ruling and Decree of the Water Court issued in Case No. 03CW108 District Court, Water Division No. 2 consistent with these Operating Criteria.

Part B - Allocations

As set forth in Article IV of the **General Operating Principles**, an allocation will be made to provide each acre of the **District irrigable area** an equitable share of the **District water supply**, provided such allocation will not exceed the irrigation requirement at the farm headgate. The following details shall apply to the allocation:

1. In advance of the **irrigation season** the **District** shall determine the reasonable minimum **District water supply** expected to be available for allocation for the following **irrigation season**. This determination shall be based on the water currently in storage, plus the reasonable minimum **reservoir inflow** and stream gains below Trinidad Dam which are forecasted to be available to the **District** during the **irrigation season**, less the **reservoir** evaporation chargeable to the **irrigation capacity** and less that quantity reserved for the Model Land & Irrigation Company as provided for in Part B.1(a) below and less that quantity in storage in the **Trinidad storage account**, and less any remaining water stored in the **Trinidad delayed return flow account**, and less that quantity in storage in the **State Parks account**.

(a) In advance of the **irrigation season** the **District** shall reserve for the use of the Model Land & Irrigation Company (including the water conveyed and allocated to the City of Trinidad pursuant to an agreement between the City of Trinidad and the Model Land & Irrigation Company sometimes known as the "Separation Agreement" recorded at Instrument No. 200000649212 in the real estate records of Las Animas County hereinafter "the Trinidad Model Account Water" and the water in the Model Account changed for use by State Parks in Case No. 03CW108 hereinafter the "State Parks Model Account Water") a maximum of 1,200 acre-feet of that water presently in storage credited to the **Model account** and that which will be credited during the following **irrigation season** to the **Model account** in the manner hereafter set forth in "Part C - Operations."

2. In advance of the **irrigation season**, the **District** shall make the initial allotment based on the reasonable minimum **District water supply** expected to be available for allocation as determined in Part B.1 above.

3. The allotment shall be expressed as the total volume of water in acre-feet available at the river for the lands lying under each of the ditch systems so as to provide, with an allowance for the canal and lateral losses of the individual ditch systems, each acre of the **District irrigable area** an equitable share at the farm headgate except as set forth in Part B.5(e) below.

4. For each acre of the **District irrigable area** which is to be withdrawn from irrigation pursuant to a change of water right, an amount of water shall be allocated-on the same basis as other irrigable area within the **District**, except the Hoehne Ditch.

5. The initial allotment shall be made in the following manner:
- (a) That part of the expected reasonable minimum **District water supply** that consists of stream gains below Trinidad Dam, which are divertible to the **District irrigable area** and **reservoir inflow** available for irrigation and **M&I use** shall be equitably allocated as part of the initial allotment to each acre of the **District irrigable area**.
 - (b) The water presently in storage credited to the **Model account** and the reasonable minimum expected to be credited to the **Model account** during the following **irrigation season**, exclusive of that reserved under Part B.1(a) above, shall be allocated as part of the initial allotment to the acreage of the Model Land & Irrigation Company, but limited to the extent that such allotment plus the allocation made under Part B.5(a) above, will not exceed irrigation requirements.
 - (c) The water presently in storage credited to the **Project account** and the reasonable minimum expected to be credited to the **Project account** during the following **irrigation season**, other than water in **Trinidad storage account**, the **Trinidad delayed return flow account**, and **State Parks account** from previous seasons, shall be allocated as part of the initial allotment to each acre of the **District irrigable area** other than those of the Model Land & Irrigation Company so that each acre receives an allotment equivalent to that of the acre age of the Model Land & Irrigation Company, subject to the requirements of the rulings in Case No. 86CW025, District Court, Water Division No. 2.
 - (d) The **Project account**, other than that in **Trinidad storage account**, the **Trinidad delayed return flow account**, and **State Parks account** from previous seasons, not allocated under Part B.5(c) above shall be equitably allocated as part of the initial allotment to each acre of the **District irrigable area**, subject to the requirements of the rulings in Case No. 86CW025, District Court, Water Division No. 2.
 - (e) If the **Project account** is insufficient to furnish an allotment equivalent to that allocated from the **Model account** as in Part B.5(b) above, then the initial allotment to the acreage of the Model Land & Irrigation Company will exceed the initial allotment to the other acres of the **District irrigable area**, subject to the requirements of the rulings in Case No. 86CW025, District Court, Water Division No. 2.
6. If, as the **irrigation season** advances, more water than expected becomes available as the **District water supply**, an additional allotment will be added to the existing allotment according to the provisions in Part B.5 above.
7. Water allocated under Parts B.5 and B.6 from the **District water supply** to acreage historically irrigated by water rights owned or controlled by the City of Trinidad (not including the 500 acre-feet of Model Storage Account water conveyed to the City of Trinidad pursuant to paragraph 2(c) of the Separation Agreement and up to 1,200 acre feet

of "Emergency Drought Water" pursuant to paragraph 8(b) of the Separation Agreement) shall be made available for use by the City of Trinidad or its designees only when the ditch company which historically delivered water to acreage historically irrigated is calling for its allocation, and as follows:

(a) For each acre-foot of water allocated to the John Flood Ditch and Model Ditch and **removed from irrigation** by the City of Trinidad:

1) 0.65 acre-feet (65%) may be transferred to the **Trinidad storage account** in Trinidad Reservoir for immediate application or storage and subsequent application.

2) 0.25 acre-feet (25%) shall be delivered to the John Flood Ditch river headgate (the same as the Model Ditch headgate) and returned to or left in the Purgatoire River to maintain the historic return flow patterns to the Purgatoire River during the **irrigation season**.

3) 0.10 acre-feet (10%) shall be retained in a separate account in the **Trinidad delayed return flow account** for later release, at constant flow unless there is a determination by the **Colorado State Engineer** to release water at some other rate for efficiency of use to maintain **non-irrigation season** delayed return flow patterns to the Purgatoire River.

(b) Water allocated to acreage other than that **removed from irrigation** shall be released or made available for direct diversion and use by assignees and lessees of the City of Trinidad for irrigation of **District irrigable acreage** in accordance with these criteria and the operating principles.

8. State Parks may only request use of the State Parks Model Account Water with timely notice to the Model Land & Irrigation Company and the District. Water allocated under Parts B.5 and B.6 from the District water supply to acreage historically irrigated by the Model Land & Irrigation Company and now owned or controlled by **State Parks** shall be made available for use by **State Parks** or its designees only when the Model Land & Irrigation Company is calling for its allocation, and as follows:

(a) For each acre-foot of water allocated to the Model Ditch at the farm headgate and **removed from irrigation** by **State Parks**:

1) 0.64 acre-feet (64%) may be transferred to the **permanent fishery pool capacity** or **State Parks Account** for immediate storage.

2) 0.25 acre-feet (25%) shall be delivered to the Model Ditch river headgate and returned to or left in the Purgatoire River to maintain the historic return flow patterns to the Purgatoire River during the **irrigation season**.

3) 0.10 acre-feet (10%) shall be retained in a separate sub-account

within the **State Parks account** for later release, at constant flow unless there is a determination by the office of the **Colorado State Engineer** to release water at some other rate for efficiency of use, to maintain **non-irrigation season** delayed return flow patterns to the Purgatoire River.

4) 0.01 acre-feet (1%) shall be transferred to a subaccount of the State Parks account for purposes of replacing evaporation from the State Parks subaccount during storage and replacing transit losses associated with the delivery of said delayed return flows. Any water that is transferred to the State Parks subaccount that is not needed to replace such evaporative and transit losses may subsequently be transferred to the Permanent Fishery Pool.

9. Any part of an allotment that remains unused at the end of the **irrigation season** shall revert to the account from which it was allocated:

- (a) except for that water in the **Trinidad storage account** and the **Trinidad delayed return flow account** as set forth in Parts A.6 and A.7 .which has been made available for use by the City of Trinidad or its designees as specified in Part B.7 above; and
- (b) except for that water in the **State Parks account** as set forth in Part A.10 which has been made available for use by **State Parks** as specified in Part B.8 above; and
- (c) except for water stored for release during the non-irrigation season to maintain historical return flow patterns for lands “removed from irrigation” as that term is defined in the General Operating Principles, subject to compliance with the Operating Principles.

10. Each ditch will be responsible for administering and maintaining records of District allocations to the owners of lands or water rights under that ditch so as to assure proper scheduling and delivery of each user's allotment.

11. Any future increase in transportation efficiencies derived from improved facilities shall accrue to the benefit of those responsible for the improvement of facilities to the extent such water will still be used beneficially and in accordance with the **Operating Principles**.

12. Nothing herein shall be construed to prevent rental of part or all of an allocation from one portion of the **District irrigable area** to another.

Part C - Operations

The water stored in the **irrigation capacity** will be credited to two accounts, the **Model account** and the **Project account**. The **Trinidad storage account**, the **Trinidad delayed return flow account**, and the **State Parks account** will be sub-accounts of the **Project account**. The following criteria apply to the operation of these two accounts.

I. General Provisions

(a) Water credited to the **Model account** shall be stored only in the **Model space reservation**. Water shall be stored in the **Model space reservation** under the **transferred Model right** in the manner set forth in Parts C.2(a) and C.2(b) below.

(b) Water credited to the **Trinidad storage account** and the **Trinidad delayed return flow account** shall be stored in the manner set forth in Part B.7(a). The City of Trinidad may also store transmountain water or other storage water rights which the City of Trinidad may lawfully deliver to Trinidad Reservoir for its use in the **Trinidad storage account**.

(c) Water credited to the **State Parks account** shall be stored in the manner set forth in Part B.8(a). **State Parks** may also store transmountain water or other storage water rights, which **State Parks** may lawfully deliver to Trinidad Reservoir for its use in the **State Parks account** or the **permanent fishery pool capacity**.

(d) Water credited to the **Project account** may be stored in any of the **irrigation capacity** not occupied by the **Model account** so long as such storage does not interfere with the crediting of water to the **Model account**.

(e) The cumulative total of water credited to the **Model account** shall be limited to 6,000 acre-feet in any one year period beginning at the end of the **irrigation season** and the maximum quantity in the **Model account**, including holdover storage, shall be limited to 6,000 acre-feet at any time.

(f) That quantity reserved for the use of the Model Land & Irrigation Company (including the Trinidad Model Account Water and the State Parks Model Account Water) under Part B.1(a) shall be retained in the **Model account** until the **Project account** is determined empty by the **District**, at which time it will become available for the use by the Model Land & Irrigation Company, the City of Trinidad, and **State Parks** within the **District**. Such water may be used by the City of Trinidad and **State Parks** for **M&I uses**, but it may not be transferred to the **Trinidad storage account** or the **permanent fishery pool**; if not used, such water will be retained in the **Model account**. Such water may be used by the City of Trinidad and **State Parks** for only one use and may not be successively used nor the return flow therefrom reused.

2. Manner of Crediting

(a) Storing during the non-irrigation season

1) **Reservoir inflow** stored under the **transferred Model right** during the **non-irrigation season** will be credited one-third to the **Model account**, and two-thirds to the **Project account** until the limitations defined in Part C.1(e) above are reached, after which all **reservoir inflow** storable under the **transferred Model right** will be credited to the **Project account**.

2) All **reservoir inflow** storable in the **unused sediment capacity** during the **non-irrigation season** shall be stored and credited to the **Project account**.

(b) Storing during the irrigation season

1) Of the first 300 cubic feet per second of **reservoir inflow**, that portion not required for the current actual irrigation requirements shall be stored and credited to the **Project account**.

2) During the **irrigation season**, inflow to the **reservoir** in excess of a daily mean of 300 cubic feet per second of time or current actual irrigation requirements, whichever is greater, shall be stored in the **Model account** until filled; thereafter, such excess shall be stored in the **Project account** until filled, at which time any excess may be utilized under Model direct-flow rights and John Flood rights up to a total of 323.63 cubic feet per second.

3) All **reservoir inflow** storable in the **unused sediment capacity** during the **irrigation season** shall be stored and credited to the **Project account**.

3. Manner of Release When the **reservoir inflow** and stream gains below Trinidad Dam which are divertible to the **District irrigable area** are insufficient to meet **District** irrigation requirements, releases will be made from the **irrigation capacity** within allotments to augment the available direct-flow supplies. These releases will be made as part of the allocated **District water supply** from the two accounts and three sub-accounts as follows:

(a) Such releases for land, other than lands of the Model Land & Irrigation Company, shall be charged to the **Project account**.

(b) When the **Model account** is over 1,200 acre-feet such releases attributable to lands of the Model Land & Irrigation Company shall be charged to the **Model account**.

(c) When the **Model account** is 1,200 acre-feet or less such releases

attributable to lands of the Model Land & Irrigation Company shall be charged to the **Project account**.

(d) The 1,200 acre-feet maximum reserved for the use of the Model Land & Irrigation Company (including the Trinidad Model Account Water and the State Parks Model Account Water) under Part B.1(a) shall be released or made available at the request of the Model water users, the City of Trinidad, or **State Parks** after the **Project account** is determined empty by the **District**.

(e) Releases from the **Trinidad storage account** shall be made upon the request of the City of Trinidad.

(f) Releases from the **Trinidad delayed return flow account** shall be made as set forth in Part B.7(a)3 above.

(g) Releases from the **State Parks account** shall be made as set forth in Part B.8(a)3 above.

4. The daily deliveries of the **District water supply** will largely be governed by the requests by the ditches, the City of Trinidad, or **State Parks** to receive water remaining in their allotments for their irrigation or **M&I uses**. However, the District shall reserve the right to maintain a schedule of diversions when necessary to reduce transportation losses and to facilitate irrigation practices.

Part D - Evaporation and Seepage Losses

As provided in the **Operating Principles**, the evaporation and seepage losses to water stored in the **irrigation capacity** or the **permanent fishery pool capacity** shall be determined using the most recent data available by the **Colorado State Engineer** and the **District** with the cooperation of the **operating agency**. The following criteria are necessary to accomplish the accounting of water stored in the **reservoir**.

1. Evaporation Losses

(a) The evaporation loss to be charged against the **irrigation capacity** shall be determined as the evaporation from the water surface area that would occur if the water stored under the **District storage right** for irrigation and **M&I uses** were the only water stored in Trinidad Reservoir.

(b) The evaporation loss to be charged against the **permanent fishery pool** shall be determined as the increase in evaporation occurring as a result of the increase in **reservoir** water surface area occasioned by the addition of the **permanent fishery pool** to water stored within the **irrigation capacity**.

2. Seepage Losses The proportion of the **reservoir** seepage loss resulting from water stored in the **irrigation capacity** or the **permanent fishery pool capacity** shall be

the proportion of water stored in that capacity to the total water stored in the **reservoir**.

(a) The proportion of **reservoir** seepage loss resulting from water stored in the **irrigation capacity** shall be charged against the **District water supply**.

(b) The proportion of **reservoir** seepage loss resulting from the **permanent fishery pool** shall be charged against the **District water supply** to the extent it is divertible in a manner consistent with the Operating Criteria for irrigation or stock water use, except that if there is no **District water supply** available such **reservoir** seepage will be replaced by **reservoir inflow**.

If the **reservoir inflow** is insufficient for making such replacement, the deficit will be charged against a future **District water supply**.

(c) The proportion of **reservoir** seepage loss resulting from the **permanent fishery pool** not divertible in a manner consistent with the operating criteria for irrigation or stock water use shall be charged against the **permanent fishery pool**.

Part E - Exercise of Water Rights

As provided in Article IV of the **Operating Principles**, the **District** may not exercise any of the direct flow water rights when the **irrigation capacity** is determined to be empty by the District. When the **irrigation capacity** is determined to be empty, the **reservoir** inflow and stream gains below Trinidad Dam which are divertible to the **District irrigable area** may be diverted by the water right owners exercising their rights in priority and the Model Land & Irrigation Company, the City of Trinidad, and **State Parks** may use the quantity of water reserved under Part B.I(a), provided no diversion be made in excess of the irrigation requirement for any portion of the **District irrigable area**. These Operating Criteria do not otherwise apply when the water right owners are exercising their rights in priority. Whenever **reservoir** inflow and stream gains below Trinidad Dam which are divertible to the **District irrigable area** should thereafter exceed such requirements, the **District** shall resume exercise of the direct flow water rights and shall store the excess under the **District storage right**.

The following details shall apply in determining when the **irrigation capacity** is empty.

1. The **District** shall declare in writing to the **Colorado State Engineer**, **State Parks**, the **operating agency**, and the **District** water users, the date, ten days in advance, on which the **irrigation capacity** will be considered empty and diversion by priority appropriation begin. Such data shall be based on the date the **irrigation capacity**, less that quantity reserved to the Model Land & Irrigation Company, the **Trinidad storage account**, the **Trinidad delayed return flow account**, the **State Parks account**, and water stored for release during the non-irrigation season to maintain historical return flow patterns for lands “removed from irrigation” as that term is defined in the General Operating Principles, subject to compliance with the Operating Principles, would be drawn down to less than one day's run of water if used to fully satisfy the current irrigation requirement of the **District irrigable area**.

2. The manner in which the ditches request delivery of their allotment shall not affect the declared date.

3. The declared date may be adjusted to compensate for changing water supply conditions. Notice of such adjustment shall be given by the **District** to the parties listed in Part E.1 above by whatever means the **District** shall find most likely to convey such notice to said parties in relation to the circumstances of such adjustment.

4. The date the **irrigation capacity** is determined to be empty shall also be the date the **Project account** is considered empty and **the District water supply** considered consumed.

Part F - Review and Amendment

These operating criteria may be subject to review by the **District** and the Bureau of Reclamation once each year and shall be subject to at least one review every 10 years. The object of such reviews will be amending these criteria to obtain the optimum beneficial use of water as conditions change, operating experience is gained, and more technical data become available.

APPENDIX D
ARKANSAS RIVER COMPACT ADMINISTRATION RESOLUTIONS

ARKANSAS RIVER COMPACT ADMINISTRATION		
Lamar, Colorado 81052		
For Colorado	Chairman and Federal Representative	For Kansas
James Eklund, Denver	James T. Rizzuto, Swink	David Barfield, Manhattan
Colin Thompson, Holly		Randy Hayzlett, Lakin
Scott Brazil, Vineland		Hal Scheuerman, Deerfield

RESOLUTION 2014 - 3

**AMENDMENT TO THE OPERATING PRINCIPLES
TRINIDAD DAM AND RESERVOIR PROJECT
AMENDED 2004**

WHEREAS, the Arkansas River Compact Administration (“Administration”) adopted Resolution 2012-01 at its annual meeting on December 6, 2012 in Garden City Kansas; and

WHEREAS, Resolution 2012-01 related to two distinct amendments to the Operating Principles of the Trinidad Dam and Reservoir Project as last amended in 2004 (“Trinidad Operating Principles”); and

WHEREAS, the first amendment approved in Resolution 2012-01 concerned the issue of whether water stored in the City of Trinidad’s account in the joint use capacity of Trinidad Reservoir could be used outside of the Purgatoire River Water Conservancy District; and

WHEREAS, the City of Trinidad is still negotiating with the Bureau of Reclamation regarding the first amendment proposed in Resolution 2012-01; and

WHEREAS, the second amendment approved in Resolution 2012-01 concerned the amount of water attributable to the historic consumptive use on acreage removed from irrigation that may be stored in the City’s account in the joint use capacity, as limited by Article IV.B.4(a)(1) of the Trinidad Operating Principles; and

WHEREAS, the second amendment proposed in Resolution 2012-01 is agreeable to all of the signatories to the Trinidad Operating Principles; and

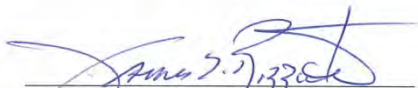
WHEREAS, on behalf of the City of Trinidad, the Purgatoire River Water Conservancy District has requested this 2014 Resolution; and

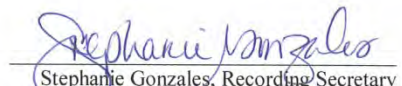
WHEREAS, the Administration is a signatory to the Trinidad Operating Principles and all signatories must approve amendments to them.

NOW, THEREFORE, BE IT RESOLVED that the Administration hereby approves the amendment to the Trinidad Operating Principles, as set forth in Exhibit A of this Resolution, which is identical to Exhibit B of Resolution 2012-01;

AND BE IT FURTHER RESOLVED that the Administration authorizes its Chairman to sign the Trinidad Operating Principles as amended by Exhibit A of this Resolution, subject to approval by all signatories.

ADOPTED by the Arkansas River Compact Administration at its 2014 Annual Meeting on December 17, 2014 in Lamar, Colorado.


James T. Rizzuto, Chairman
Arkansas River Compact Administration


Stephanie Gonzales, Recording Secretary
Arkansas River Compact Administration

No. 6 of 6 originals

- (1) Only water attributable to the historic consumptive use on acreage **removed from irrigation**, limited to ~~948~~1171.7 acres under the Johns Flood Ditch system and 373.7 acres under the Model Land and Irrigation Company system, may be made available for M&I storage or **permanent fishery pool** storage. Water deliveries shall be limited to the following volumes, which shall not include the volumes retained in storage for later release to maintain historic delayed return flow patterns to the Purgatoire River:

	Maximum Monthly Water Deliveries (acre-feet)
Apr	<u>220 257</u>
May	<u>345 403</u>
Jun	<u>565 661</u>
Jul	<u>685 801</u>
Aug	<u>620 725</u>
Sep	<u>345 403</u>
Oct	<u>460 187</u>
Nov - Mar	<u>0</u>
Annual Total	<u>2,802 3276</u>

ARKANSAS RIVER COMPACT ADMINISTRATION		
Lamar, Colorado 81052		
For Colorado	Chairman and Federal Representative	For Kansas
Jennifer Gimbel, Denver	Vacant	David Barfield, Topeka
Colin Thompson, Holly		Randy Hayzlett, Lakin
Matt Heimerich, Olney Springs		David A. Brenn, Garden City

RESOLUTION 2012- 01

**AMENDMENTS TO THE
OPERATING PRINCIPLES
TRINIDAD DAM AND RESERVOIR PROJECT
AMENDED 2004**



WHEREAS, the Purgatoire River Water Conservancy District ("the District") on behalf of the City of Trinidad ("the City") has requested the consideration of amendments to the Operating Principles of the Trinidad Dam and Reservoir Project as last amended in 2004 ("Trinidad Operating Principles"); and

WHEREAS, the Trinidad Operating Principles presently limit the use of water to uses within the District; and

WHEREAS, the City is within the boundaries of the District; and

WHEREAS, the City may store water that is fully consumable in its storage account in the joint use capacity, among other water; and

WHEREAS, the City has requested to use water that is fully consumable and stored in the City's account on lands within the Purgatoire River basin at or above Trinidad Reservoir, but outside the boundaries of the District; and

WHEREAS, to supply water that is fully consumable outside the boundaries of the District, an amendment to the Trinidad Operating Principles is necessary and appropriate as stated in Exhibit A; and

WHEREAS, the amount of water attributable to the historic consumptive use on acreage removed from irrigation that may be stored in the City's account in the joint use capacity is limited by Article IV.B.4 (a) (1) of the Trinidad Operating Principles; and

WHEREAS, the number of historically irrigated acres removed from irrigation that the City can obtain and use is also limited by Article IV.B.4 (a) (1) of the Trinidad Operating Principles; and

WHEREAS, the City has acquired additional water rights and, as a result, the limits contained in Article IV.B.4 (a) (1) of the Trinidad Operating Principles should be adjusted as indicated in Exhibit B; and

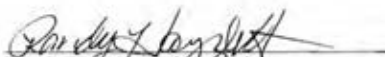
WHEREAS, the Arkansas River Compact Administration ("Administration") is a signatory to the Trinidad Operating Principles and all signatories must approve amendments to them; and

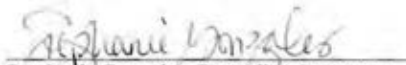
WHEREAS, the amendments proposed by the District and attached hereto have been reviewed by the ARCA Engineering Committee and recommended for approval by the Administration.

NOW, THEREFORE, BE IT RESOLVED that the Administration hereby approves the amendments to the Trinidad Operating Principles, as set forth in Exhibits A and B.

AND BE IT FURTHER RESOLVED that the Administration authorizes its Chairman to sign the Trinidad Operating Principles as amended by Exhibits A and B, once all other signatories have approved the same.

ADOPTED by the Administration at its 2012 Annual Meeting on December 6, 2012 in Garden City, Kansas.


Randy Hazlett, Vice Chair
Arkansas River Compact Administration


Stephanie Gonzales, Recording Secretary
Arkansas River Compact Administration

3 of 6

New Proposed Article IV.B.4.a.(5)

Trinidad Project Operating Principles

- (5) Notwithstanding any other provision herein, any fully consumable water stored in the City of Trinidad's account in the joint use capacity, as authorized in the Agreement between the City of Trinidad and the **District** dated April 20, 1966, pursuant to water rights acquired or owned by the City of Trinidad may be used within the Purgatoire River basin at or above Trinidad Reservoir. Water stored in the City of Trinidad's account may also be used within the **District**.

EXHIBIT A

Amendment to Article IV.B.4.a.(1)
Trinidad Project Operating Principles

- (1) Only water attributable to the historic consumptive use on acreage **removed from irrigation**, limited to ~~948~~1171.7 acres under the Johns Flood Ditch system and 373.7 acres under the Model Land & Irrigation Company system may be made available for M&I storage or **permanent fishery pool** storage. Water deliveries shall be limited to the following volumes, which shall not include the volumes retained in storage for later release to maintain historic delayed return flow patterns to the Purgatoire River:

	Maximum Monthly Water Deliveries (acre-feet)
Apr	220257
May	345403
Jun	565661
Jul	685801
Aug	620725
Sep	345403
Oct	160187
Nov - Mar	0
Annual Total	2,803,327.6

Exhibit B

APPENDIX E

**2017 CDWR APPROVAL OF PRWCD'S IRRIGATION IMPROVEMENT RULES
COMPLIANCE PLAN**



COLORADO
Division of Water Resources
Department of Natural Resources

June 12, 2017

Steven J. Kastner P.E.
Purgatoire River Water Conservancy District
3590 East Main Street, Suite 3
Trinidad, CO 81082

Via E-mail: kastner99@gmail.com

RE: APPROVAL OF PRWCD'S IRRIGATION IMPROVEMENT RULES COMPACT COMPLIANCE PLAN
APPLICATION FOR 2017-18 PLAN YEAR (APPROVED THROUGH APRIL 30, 2018)

Dear Steve Kastner:

We have reviewed your April 29, 2017 Application on behalf of the Purgatoire River Water Conservancy District (PRWCD) for a **COMPACT COMPLIANCE PLAN ("PLAN")** for the 2017 Plan Year (May 1, 2017 through April 30, 2018) pursuant to the COMPACT RULES GOVERNING IMPROVEMENTS TO SURFACE WATER IRRIGATION SYSTEMS IN THE ARKANSAS RIVER BASIN IN COLORADO ("Irrigation Improvement Rules") approved in Case No. 09CW110. The Application was provided to the Division of Water Resources Notification List on May 1, 2017.

No comments were submitted by any parties.

A. Number of Farms/Improvements Covered by the 2017 Plan:

Your Application is for two member's improvements to irrigation systems on two farms.

B. Quantity of Return Flow Deficits and Maintenance Flow Obligations:

Total estimated reduction in return flows for which maintenance flows are to be provided under this Plan during the 2017-18 Plan Year was estimated to be less than 20 acre-feet during the irrigation season. Actual deficits and maintenance flow obligations under the Plan will be determined via the monthly accounting and actual conditions. This quantity does include maintenance obligations resulting from the lagged impact of improvement operations which occurred under last year's Plan and prior Plan Years.

Additional return flow deficits beyond what will occur during this Plan Year will occur after the April 30, 2018 expiration date of this Plan due to diversions of surface water supplied to the improvements during the Plan Year and prior Plan Years. Maintenance of these return flows must also be accomplished under this Plan, as further described in the terms and conditions below.

C. Timing and Location of Return Flow Deficits and Maintenance Flow Obligations:

The location and timing of reductions in return flow anticipated to occur at the Arkansas River in all reaches has also been calculated using the ISAM Model as defined in the Irrigation Improvement Rules.

The tailwater return flows are assumed to occur in the same month as farm headgate

Office of the State Engineer
1313 Sherman Street, Suite 818 • Denver, CO 80203 • Phone: 303-866-3581 • Fax: 303-866-3589
www.water.state.co.us

deliveries. The timing and location of the deep percolation portion of the return flow reductions was modeled using the Ground Water Accounting Model (GWAM).

D. Dedicated Source for the Required Maintenance Flow Deliveries:

PRWCD proposes to use water from a lease of stored water from the Model Land & Irrigation Company representing a portion of the Model Ditches water rights under the Purgatoire River Water Conservancy District's Project water supply. The second source is water derived from the subject water right (Enlarged Southside Ditch Project supply) to provide for maintenance of the return flows for the surface water improvements covered by this Plan. This water will be released from Trinidad Reservoir as needed to maintain monthly return flows.

PRWCD has proposed that these same sources would be used for maintenance of any return flow obligations that occur after the conclusion of this Plan Year.

This office has determined that the projected supply from these sources is adequate, appropriate and sufficiently reliable to maintain the reduced return flows (including associated transit losses, which must be provided with each maintenance flow delivery) that have been estimated for this Plan Year.

F. Determination:

The State and Division Engineers have reviewed the Plan and the adequacy of the sources of water provided to maintain return flows, including, where necessary, the appropriateness for delivery to each impacted location. The State and Division Engineers have determined that, subject to the terms and conditions set forth below, the approved Compact Compliance Plan will prevent a violation of Article IV-D of the Arkansas River Compact for the improvements covered by this Plan.

This PLAN is hereby approved pursuant to the following TERMS AND CONDITIONS:

- 1) **The 2 farms with improved irrigation systems in this PLAN** as listed in **Enclosure 1** may be operated as described in this Plan.
- 2) The attached maps at **Enclosure 2** show the location of systems covered by the Plan.
- 3) Systems covered by this Plan that have not yet been installed have been mapped in **Enclosure 2** as if they had already been built. Owners of these systems must provide notice to PRWCD and the Division Engineer upon installation of the systems so that the improved acreage can be confirmed to be consistent with the Plan approval.
- 4) No system may be included unless it receives surface water as some portion of its supply. All systems included in the Plan have been confirmed to receive surface water by PRWCD.
- 5) Additional irrigation systems and/or additional sources of water for maintenance flows may be included in this Plan only if an amendment to the approved Plan is submitted, circulated with time for comments as required the Rules, and approved. Any request for amendment must include, at a minimum: identification of the subject improved system(s) including detailed historical and improved mapping and number of ditch shares used on the farm; an estimate of the amount of return flow deficit and return flow maintenance water for each system; an update of the total estimated return flow replacement by reach and month including post-Plan return

flow maintenance; and identification of the source of additional return flow maintenance water. Approval of an amendment will be contingent upon PRWCD demonstrating it has sufficient return flow maintenance water to cover the additional return flow deficits caused by added systems.

- 6) In compliance with Rule 10.A, a copy of the form required by Rule 8.A, signed by the owner or user of the surface water irrigation system or his or her Designated Agent, must be maintained on file by PRWCD for each improvement covered under the Plan and available for inspection by the Division Engineer.
- 7) PRWCD will maintain return flows for deficits occurring after the expiration date of the Plan (**April 30, 2018**) caused by deliveries of surface water to the improvements during the life of the Plan and in prior Plan Years. To guarantee that sufficient return flow maintenance water will be provided to maintain historical return flows, PRWCD agrees to commit a sufficient amount of water from appropriate sources, **with notice to the Division Engineer, by no later than April 1, 2018.**
- 8) PRWCD will provide monthly accounting in cooperation with the Division Engineer and the Water District 19 Water Commissioner by the 10th day of each month. Monthly return flow obligations and monthly deliveries of maintenance flows, minus transit losses, will be reflected in the river reach where historical return flows accrued. PRWCD must ensure that return flows are delivered appropriately below any Project ditches not entitled to receive the return flows by working with the Water District 19 Water Commissioner through proper notice of deliveries.
- 9) Credits and deficits may only be carried forward one month, except that the maintenance flows for November through March may be combined into one delivery in March. PRWCD will make delivery for winter return flows, if a deficit exists, by release to the river as directed by the Division Engineer.
- 10) PRWCD will also provide an annual accounting to the Division Engineer of the actual operations under the Plan conducted **by May 20, 2018.** It shall include the change in historical seepage losses and return flows by month from each improvement covered under the Plan and the amount, time, and location of all water provided under the Plan to maintain historical seepage losses and return flows, as well as the projected monthly operations under the Plan for the upcoming year.
- 11) PRWCD will promptly report to the Division Engineer's Office any lack of compliance by the member systems in this Plan. PRWCD will monitor the overall performance of this Plan by comparing the approved operational conditions with the actual conditions, after determining the actual conditions in cooperation with the Division Engineer's Office.
- 12) Enlarged Southside Ditch shares historically associated with each of the farms and used on those farms must continue to be diverted at the Enlarged Southside Ditch headgate and all canal and lateral losses historically occurring associated with these farms must continue to be maintained in the canal and laterals so that no other Enlarged Southside Ditch shareholders are injured by operations under this Plan.
- 13) PRWCD must coordinate with the River/Reservoir Operations staff in the Division Engineer's Office and the Water District 19 Water Commissioner to ensure that appropriate transit losses

are determined for return flow maintenance deliveries above the point of historic return to the extent sources other than the subject water rights are used.

- 14) The Water District 19 Water Commissioner will confirm pond surface areas during actual operations during the irrigation season and any adjustment to average pond operational area shall be incorporated into the accounting as soon as possible upon notice.
- 15) Acceptance of these conditions and any questions regarding these conditions must be made in writing to the Division Engineer (Steve.Witte@state.co.us, 310 East Abriendo, Suite B, Pueblo CO 81004, FAX (719) 544-0800) by 5:00 p.m. on June 30, 2017. Failure to provide written acceptance by June 30, 2017 will result in these conditions being deemed accepted.

I want to thank you for your cooperation and efforts to coordinate with the associated farmers and our office in preparing this Compact Compliance Plan. Through it, PRWCD has provided an assured path to comply with these Rules at low cost and has facilitated the use of irrigation system improvements in the Arkansas River Basin while maintaining compliance with the Compact. Your efforts are greatly appreciated. If you have any questions, please do not hesitate to contact any of my staff in Pueblo.

Sincerely,



Dick Wolfe
Director of Water Resources
State Engineer

2 Enclosures

- C: Steve Witte, Division Engineer
Dan Steuer, Attorney General's Office
Julianne Woldridge
Kevin Salter
Dale Book
WD 19 Water Commissioner
Notification List by Email
FILE: PRWCD – 2017 PLAN Year

2017 Compact Compliance Plan
For
Purgatoire River Water Conservancy District

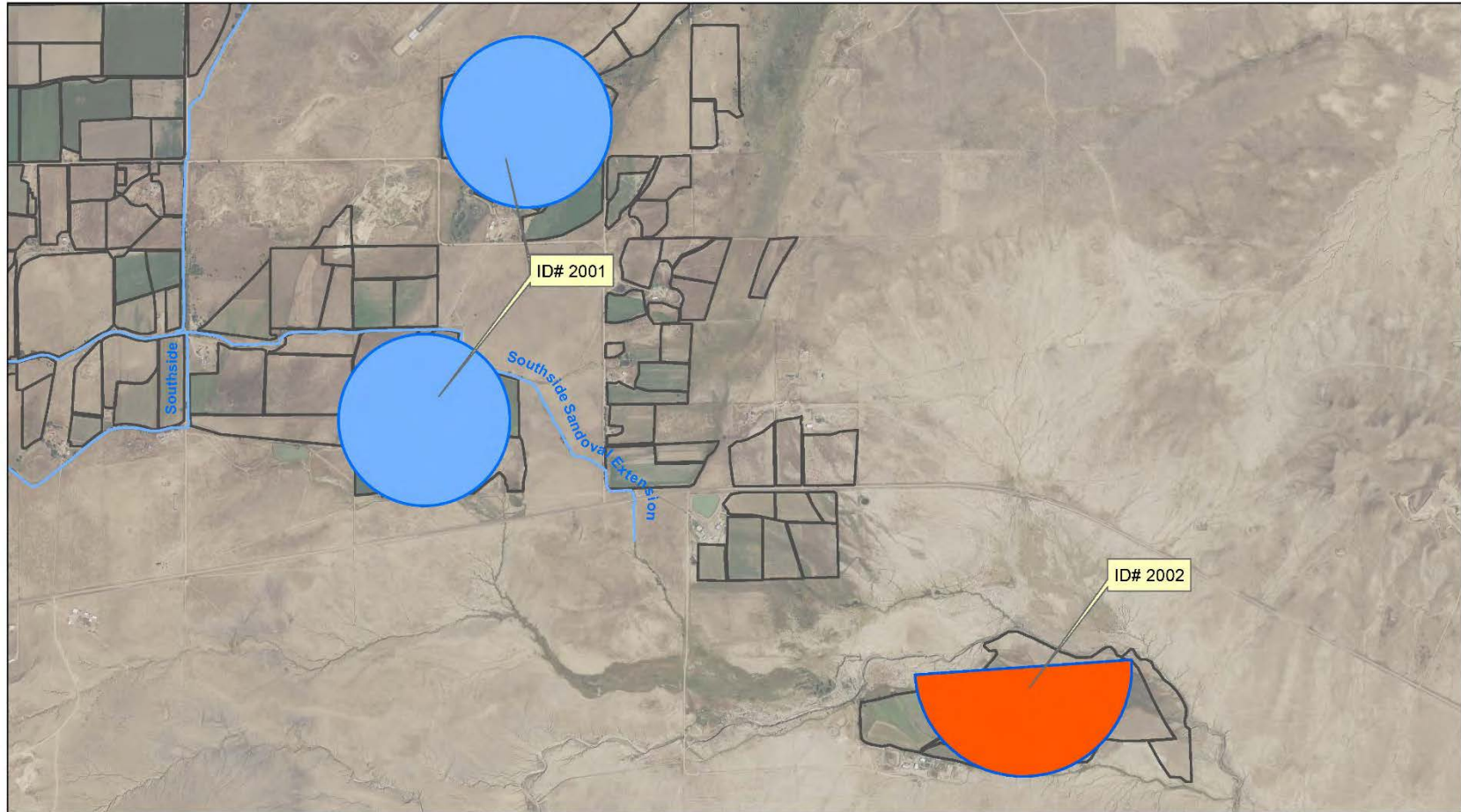
Enclosure 1: Summary of Surface Water Systems Included in Plan





Enclosure 1 - Rule 10 Plan Member Report

	Farm	Flood Acres	Sprinkler Acres	Drip Acres	Lateral Acres	Canal Shares
Ditch Name: ENLARGED SOUTHSIDE						
HORIZON FARMS, Fred Eanes						
	2001	27.2	110.8	0	0	26
Moore, Cooper						
	2002	21.7	105.6	0	0	29.6
ENLARGED SOUTHSIDE Total		48.9	216.4	0	0	55.6
		216.4	0	0		
		48.9	216.4	0	0	

2017 Compact Compliance Plan
For
Purgatoire River Water Conservancy District

Enclosure 2: Maps of Surface Water Systems Included in Plan



 <p>COLORADO Division of Water Resources Department of Natural Resources</p>	 <p>Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters 2015 NAIP Aerial Photos Div. of Water Resources, Div. 2</p>	<p>Division Of Water Resources State Of Colorado</p> <p>PRWCD Irrigation Improvement Farms Under The Enlarged Southside Ditch - 2017</p> <p>Scale: 0 0.05 0.1 0.2 0.3 Miles 1:17,013</p> 	<ul style="list-style-type: none">  Fields in the PRWCD Rule 10 Plan  Fields under the Enlarged Southside Ditch  Other Fields 	
--	--	---	---	---

APPENDIX F
PRIME SOILS WITHIN THE PRWCD BOUNDARIES

BaC Baca silt loam, 0 to 3 % slopes
BnA Baca silt clay, 0 to 2 % slopes
BwA Bloom silty clay loam, 0 to 2 % slopes, occasionally flooded
CpA Calemore clay loam, 0 to 2 % slopes
CpB Calemore silt loam, 0 to 3 % slopes
CpC Capulim loam, 1 to 6 % slopes
FcB Wapiti clay loam, 0 to 3 % slopes
FcC Fort loam, 1 to 5 % slopes, cool
FtC Olnest loam, 1 to 6 % slope
Hn Hoehne fine sandy loam, 0 to 2 % slopes, occasionally flooded
HvA Haversid silt loam, 0 to 3 % slopes
MaB Mauricanyon loam, 0 to 3 % slopes, warm
MaW Mauricanyon clay loam, 0 to 2 % slopes, wet
MnA Manzanst silty clay loam, 0 to 1 % slopes
MnW Aquic Haplustalfs, 0 to 3 % slopes
MoB Mauricanyon loam, 0 to 2 % slopes
MtB Manzanst silty clay loam, cool, 0 to 2 % slopes
RcA Raku silty clay loam, 0 to 1 % slopes
TnA Trementina silty clay loam, 0 to 2 % slopes, cool
TnB Trementina slit loam, 0 to 1 % slope, dry
WK Wiley-Kandrix complex, 1 to 6 % slopes, cool
WrB Wilid silty clay loam, 1 to 3 % slopes

APPENDIX G

**2004 ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT**

TRINIDAD INV-600

RECLAMATION

Managing Water in the West

Trinidad Dam and Reservoir Project Operating Principles and Operating Criteria Amendment

Final Environmental Assessment



U.S. Department of the Interior
Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

Cooperating Agency:
U.S. Army Corps of Engineers
South Pacific Division
Albuquerque District
Albuquerque, New Mexico

November 2004

ACRONYMS

af	acre-feet
APE	Area of Potential Effects
ARCA	Arkansas River Compact Administration
City	City of Trinidad
cfs	cubic feet/second
CDOW	Colorado Division of Wildlife
Compact	Arkansas River Compact
Corps	Army Corps of Engineers
District	Purgatoire River Water Conservancy District
EA	environmental assessment
EIS	environmental impact statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FWS	United States Fish and Wildlife Service
M&I	municipal and industrial
mgd	million gallons per day
MLIC	Model Land and Irrigation Company
NEPA	National Environmental Policy Act
NRCS	Natural Resource Conservation Service
Operating Criteria	Operating Criteria for the Trinidad Dam and Reservoir Project
Operating Principles	Operating Principles for the Trinidad Dam and Reservoir Project
Reclamation	Bureau of Reclamation
SHPO	State Historic Preservation Officer
State	State of Colorado Division of Parks and Outdoor Recreation
USGS	United States Geological Survey

Contents

Chapter 1: Purpose and Need

Purpose and Need.....	1
Background.....	2
Issues.....	4

Chapter 2: Alternatives

Amendment Alternative (Proposed Action).....	6
No Action.....	7

Chapter 3: Environment and Environmental Consequences

Summary of Impacts.....	8
Hydrology.....	11
Prime Farmlands.....	18
Arkansas River Compact.....	19
Threatened and Endangered Species.....	20
Species of Concern.....	25
Recreation.....	26
Social and Economic Environment.....	29
Cultural Resources.....	30

Chapter 4: Consultation and Coordination

Scoping.....	31
Cooperating Agency.....	31
Key Contacts and Consultations.....	32

Bibliography.....	33
-------------------	----

Appendix A: Modeling of Stock Water Alternatives

Appendix B: Scoping Letter and Mailing List

Scoping Letter
Mailing List

Appendix C: Comment Letters

State of Kansas
Purgatoire River Water Conservancy District
State of Colorado

Appendix D: Endangered Species Act Consultation

Species List Request

Fish and Wildlife Service Species List Concurrence

Biological Assessment

Fish and Wildlife Service Biological Assessment Concurrence

CHAPTER ONE

Purpose and Need

The U. S. Bureau of Reclamation (Reclamation) proposes to approve amendments to the existing Operating Principles for the Trinidad Dam and Reservoir Project (Operating Principles) adopted by the Arkansas River Compact Administration (ARCA) in May and December, 2003, and approve amendments to the Operating Criteria for the Trinidad Dam and Reservoir Project (Operating Criteria) to implement 1998 and 2003-proposed amendments of the Operating Principles. The proposed changes would:

- Allow the City of Trinidad (City), Colorado to use a portion of the irrigation capacity for municipal and industrial (M&I) purposes (through approval of proposed amendments to the Operating Criteria; amendments to Operating Principles to allow for this were approved in 1998)
- Allow the State of Colorado Division of Parks and Outdoor Recreation (State) to utilize 700 acre-feet (af) of the irrigation capacity to replace evaporation and seepage losses of the recreation pool (a.k.a. permanent fishery pool) (through approval of amendments to the Operating Principles adopted by ARCA in 2003 and potential amendments to the Operating Criteria)
- Allow more effective delivery of stock water during the non-irrigation season by allowing stock water to be stored in Trinidad Reservoir and released at higher rates than the 5 cubic feet/second (cfs) rate presently allowed (through approval of amendments to the Operating Principles adopted by ARCA in 2003).

The Operating Principles are a set of principles for operating the Trinidad Dam and Reservoir Project. The principles are signed by Reclamation, the U. S. Army Corps of Engineers, Albuquerque District (Corps), the chairman of ARCA, the Purgatoire River Water Conservancy District (District) and the governor of Kansas. The Operating Criteria are specific criteria for managing the irrigation capacity of the reservoir. Reclamation and the District are the signatories to the Operating Criteria.

This EA (environmental assessment), prepared in compliance with the National Environmental Policy Act (NEPA), could lead to a FONSI (*Finding of No Significant Impacts*) if environmental effects of the proposed action are found to be insignificant, or to an EIS (*environmental impact statement*) if effects are found to be significant. In the chapters to follow, background on the matter is provided (Chapter 1), alternative plans outlined (Chapter 2), affected environment discussed (Chapter 3) and effects of the alternatives analyzed (Chapter 3). The EA concludes with a brief description of the consultation and coordination done during the study (Chapter 4).

PURPOSE & NEED

The purpose and need for each of the three elements of the proposed action is presented below.

The purpose of changing the Operating Criteria to include M&I uses is to allow the City to utilize water rights that they have acquired to meet their water needs. The City has purchased water rights from irrigators who store water in the irrigation capacity at Trinidad Reservoir. The City operates its changed water rights in accordance with State law and the Operating Principles. However, the current Operating Criteria only addresses use of the irrigation capacity for irrigation purposes, and not for M&I purposes. The City is currently using some of its changed water rights for augmentation of city wells and has determined that their population growth may necessitate use of more of their water as early as 2005.

The Operating Criteria need to be amended to be consistent with the changed water rights and amended Operating Principles. This will facilitate the City's ability to address their needs.

The purpose of amending the Operating Principles and Operating Criteria to allow the irrigation capacity to be used to replace the recreation pool's evaporation and seepage losses is to improve the recreational experience at the reservoir. The surface water elevation of Trinidad Reservoir is subject to a great deal of fluctuation. This is undesirable for management of the recreation facilities, recreation experience, and for optimizing the health and success of the fishery. Stabilizing water levels and keeping them higher during the recreation season by having an annual supply of water to replenish recreation pool evaporation and seepage losses would improve the recreation experience, recreation access, and the fishery.

The purpose of changing how stock water releases are managed is to make more effective stock water deliveries. The current Operating Principles allow releases for non-irrigation season stock watering within the District, however these releases cannot exceed 5 cfs. This has proven to be an impractical method for delivering the stock water. Because these releases occur outside of the irrigation season (October – March), there are typically very few if any releases for other purposes being made at the same time as these stock water releases. Consequently, the transit losses and evaporation of these releases are high, and very little, if any, of the releases reach the stock water ponds. Allowing stock water to be stored for periods during the non-irrigation season, and then releasing the water at a higher rate (> 5 cfs) will increase the amount of water that reaches the stock water ponds.

BACKGROUND

Trinidad Dam and Reservoir are located on the upper Purgatoire River, a tributary of the Arkansas River, about 2.75 miles upstream and southwest of the City of Trinidad in south central Colorado (see Location Map). This project was authorized under the 1958 Flood Control Act for the purposes of flood control, irrigation and recreation. The Corps completed construction of the dam and began filling the reservoir in 1976.

The Corps owns and operates the reservoir, with responsibility for flood control and recreation. Reclamation is responsible for administering a repayment contract with the District, which manages the irrigation capacity of the reservoir. The Corps has an agreement with the State for management of recreation at the reservoir. Water rights are administered by the State of Colorado.

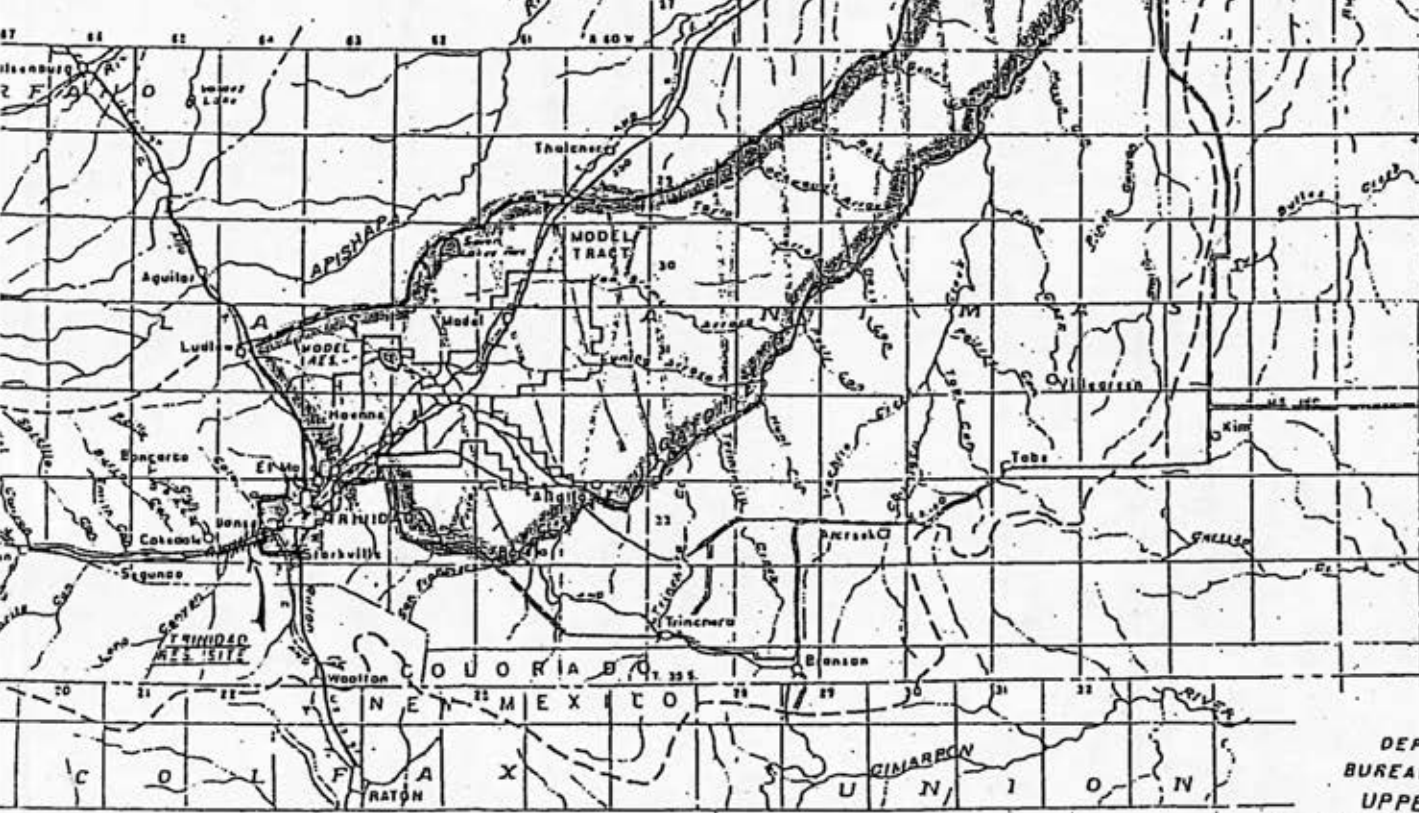
The District manages water deliveries made from the irrigation capacity of Trinidad Reservoir. They operate within defined boundaries in the basin and contract with entities that use water from the irrigation capacity.

The repayment contract between Reclamation and the District outlines the roles, responsibilities and provisions for management of the irrigation capacity by the District. The repayment contract specifies that management of the irrigation capacity will be in compliance with the Operating Principles and Operating Criteria. The repayment contract between Reclamation and the District anticipated the City's use of the irrigation capacity for M&I purposes, however the original Operating Principles and Operating Criteria only provided for irrigation uses. In 1998, the Operating Principles were amended to allow for use of the irrigation capacity for M&I purposes by the City. However, the current Operating Criteria need to be amended to allow management of the irrigation capacity for M&I purposes.






Similarly, the current Operating Principles and Operating Criteria do not allow management of the irrigation capacity for replacement of the evaporation and seepage losses from the recreation pool.

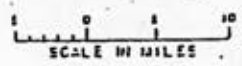


LOCATION MAP



EXPLANATION

-  Furgalote River Water Conservancy District
-  Gaging Station in Operation
-  Gaging Station Abandoned
-  Dam and Reservoir
-  Action area



UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION - REGION 7
 UPPER ARKANSAS RIVER AREA
 TRINIDAD PROJECT - COLORADO
 GENERAL MAP

JANUARY 1964 MAP NO. 823-706-5

Location Map

Stock watering is addressed in the original Operating Principles and Operating Criteria. However, the management allowed by these documents needs to be changed to allow more stock water to reach the stock watering ponds.

The City is located in south central Colorado along the Purgatoire River (see Location Map), downstream of Trinidad Reservoir. The City has 3,000 af of reserved storage space in Trinidad Reservoir. In anticipation of future water needs, the City has acquired irrigation water rights to fill the majority (up to 2,800 af) of their reserved storage space. The City is expected to continue to grow in population based on both the State of Colorado's (2003) and the City's (Black and Veatch 2001) projections.

1998 OPERATING PRINCIPLES AMENDMENT

In 1998, Reclamation executed amended Operating Principles for Trinidad Dam and Reservoir. The amendments provided for the M&I use of the irrigation capacity by the City. On November 16, 1998, Reclamation notified the City that when it withdraws water under its rights from irrigation use and makes it available for municipal and industrial use, Reclamation will complete appropriate NEPA compliance. On April 11, 2000, the District requested that Reclamation adopt changes to the Operating Criteria proposed by the City to allow the City to implement changes necessary to convert certain water rights owned by the City to M&I use. It is Reclamation's understanding that the City has current and near term needs to use the water for certain limited municipal purposes (to provide water to a private golf course and well augmentation). Therefore, concurrent with analysis of the 2003 proposed amendments to the Operating Principles, Reclamation is analyzing the City's change of water use from irrigation to municipal use.

The no action alternative considered in this analysis will consist of the pre-1998 version of the Operating Principles. Use of the pre-1998 version is necessary to adequately analyze all of the proposed amendments, including the 1998 M&I changes for which NEPA compliance has not yet been completed.

ISSUES

The following issues have been identified through public comments and Reclamation's internal scoping regarding the proposed action.

- Effects on the flows of the Purgatoire River and its tributaries downstream of Trinidad Reservoir;
- Changes in Arkansas River flows below its junction with the Purgatoire River;
- Changes in Trinidad Reservoir surface elevation and storage levels;
- Effects on recreation at Trinidad Reservoir;
- Effects of changing water used for irrigation purposes to M&I, especially on agriculture economies, prime farmlands, and City of Trinidad development;
- Effects on local socioeconomics;
- Effects of the proposed stock watering changes on the livestock industry;
- Compliance with the Arkansas River Compact;

- Impacts on Federally-listed threatened and endangered species;
- Impacts on cultural resources.

These issues are analyzed in Chapter 3.

CHAPTER TWO

Alternatives

Chapter 2 presents the two alternative plans analyzed in this EA: the *Operating Principles and Operating Criteria Amendment Alternative*—in which changes would be made to the Trinidad Dam and Reservoir Operating Principles and Operating Criteria—and the *No Action Alternative*—in which the Operating Principles and Operating Criteria would not be changed.

OPERATING PRINCIPLES AND OPERATING CRITERIA AMENDMENT ALTERNATIVE (AMENDMENT ALTERNATIVE)

In the Amendment Alternative, Reclamation would execute amended Operating Principles and Operating Criteria to allow for changes in irrigation capacity storage and releases from the reservoir for M&I, recreation, and stock watering uses. The specific changes to the Operating Principles and Operating Criteria are outlined below.

Municipal and Industrial

The alternative would amend the Operating Criteria to permit operation for M&I uses consistent with previous changes to the Operating Principles. Specifically, the consumptive use portion of irrigation water rights acquired by the City may be stored as part of the irrigation capacity and released for M&I use by the City. The Operating Principles and Operating Criteria would recognize the two irrigation water rights acquired by the City, which involve 948 acres from the John Flood Ditch system and 373.7 acres of the Model Land and Irrigation Company (MLIC) system for a total maximum annual delivery to the City of 2,802 af. Water attributable to the historic return flows associated with the acquired water rights will be released in a manner that maintains the historic return flow patterns to the Purgatoire River. The acreage listed above associated with the water rights acquired by the City will not be eligible for deliver of water from the District's water supply or be a part of the District's irrigable area.

Recreation/Permanent Fishery Pool Evaporation and Seepage Losses

The alternative would allow water in the irrigation capacity to be used to replace evaporation and seepage from the permanent fishery pool. If the State acquires rights to water stored in the irrigation capacity, acquired water could be used to replace the permanent fishery pools evaporation and seepage losses. Specifically, the Operating Principles and Operating Criteria would recognize the irrigation water rights the State has acquired, which involve 805.46 acres of the MLIC system for a total maximum annual delivery to the State of 1,708 af. Water attributable to the historic return flows associated with the acquired water rights will be released in a manner that maintains the historic return flow patterns to the Purgatoire River. The acreage listed above associated with the water rights acquired by the City will not be eligible for deliver of water from the District's water supply or be a part of the District's irrigable area.

Stock Watering

The District would be allowed to release stored water from the reservoir at rates that they determine would be sufficient to deliver water to stock ponds. The District has indicated that diversion rates of approximately 60 cfs are necessary in the larger canals to allow water to run down the canals to reach the stock ponds. The sum total of diversions would continue to be limited to 1,200 af. Based on information

provided by the District, the releases are most likely to involve three periods of releases during the non-irrigation season for durations of three days for each period.

NO ACTION ALTERNATIVE

In this alternative, the Operating Principles and Operating Criteria would not be amended to provide for M&I, recreation pool evaporation and seepage losses, and changes in stock watering.

CHAPTER THREE

Affected Environment and Environmental Consequences

Chapter 3 describes hydrology, prime farmlands, Arkansas River Compact, threatened and endangered species, recreation, economic and social environment, and cultural resources of the Trinidad Reservoir, City of Trinidad and Purgatoire River area. These are the resources that could be significantly affected by the proposed action. This description is followed by an analysis of the effects of the alternatives (explained in Chapter 2). Effects of the No Action Alternative are presented first, followed by effects of the Proposed Action.

Scoping determined that Indian trust assets (legal interests in property and rights held in trust by the U.S. for Indian tribes or individuals), environmental justice (adverse effects to a particular social-economic group, including low-income or minority populations), floodplains, wetlands, and migratory birds would not be affected by either of the alternatives in this EA. In addition, no actions were identified that when combined with either the No Action or Amendment alternative would have potentially significant cumulative effects.

SUMMARY OF IMPACTS

Table 3.1 provides a summary of the environmental effects analyzed in Chapter 3 of the EA.

Table 3.1 Summary of Environmental Effects.

<u>Resource</u>	<u>No Action Alternative</u>	<u>Amendment Alternative</u>
Hydrology <ul style="list-style-type: none"> Trinidad Reservoir 	<p>M&I. The City's John Flood and MLIC water continued to be used primarily for agricultural irrigation – no change from current use.</p> <p>Recreation Pool. Recreation pool expected to drop several thousand af between exchanges to replenish the pool, which are expected to be several years apart. Pool estimated to lose 1,060 af annually to evaporation and seepage.</p> <p>Stockwater. A portion of the 1,200 af allowable for stockwatering is expected to be unused. The</p>	<p>M&I. Only a small portion of the City's Trinidad water rights are expected to be used initially. Water will be used for well augmentation and potentially to fulfill the City's contract with Coastal LLC for golf course watering. Further use of the City's Trinidad water rights is not expected for several years. The City's initial water use will result in small amounts of additional storage in the reservoir and result in increased reservoir water volume during late-summer, fall and winter months when compared to no action.</p> <p>Recreation Pool. The recreation pool will most likely be filled or nearly filled each spring and slowly lose volume throughout the rest of the year. Fluctuation in the pool volume would most likely be limited to a few hundred acre-feet annually.</p> <p>Stockwater. The full 1,200 af available for stockwatering is expected to be used. Because the</p>

Table 3.1 Summary of Environmental Effects.

<u>Resource</u>	<u>No Action Alternative</u>	<u>Amendment Alternative</u>
<ul style="list-style-type: none"> Purgatoire River 	<p>unused portion would remain in the reservoir's irrigation capacity.</p> <p>M&I. No change in river flows from historic conditions are expected.</p> <p>Recreation Pool. The State is expected to conduct exchanges every few years to replace evaporation and seepage losses. When exchanges occur, Purgatoire River water will be diverted and stored in the recreation pool. During diversion (most likely mid-April to mid-June), flows will be reduced in the Purgatoire River below Trinidad Dam.</p> <p>Stockwater. Some diversion of stockwater and gains to the river is expected to occur; gains not diverted will remain in the river.</p>	<p>reduced reservoir volume after releases results in less evaporation, over time the effects of the releases on reservoir content decrease.</p> <p>M&I. No impact to the Purgatoire River below the Hoehne headgate (13 miles below Trinidad Dam). The following river changes are expected between the dam and Hoehne headgate:</p> <ul style="list-style-type: none"> Release of historic agricultural return flows from Trinidad Reservoir will result in higher river flows between the dam and Hoehne headgate during the non-irrigation season. When water is stored for M&I purposes, flows in the Purgatoire River between the dam and Model headgate (approximately 8 miles) will be reduced during the irrigation season. Storage of the majority of the City's water rights is not expected for a number of years. M&I water use is not expected to result in additional return flows; the City is expected to re-use water to extinction. <p>Recreation Pool. No affect on the Purgatoire River below Hoehne headgate. The following effects upstream of Hoehne headgate are expected:</p> <ul style="list-style-type: none"> Release of historic agricultural return flows from Trinidad Reservoir will result in higher river flows between the dam and Hoehne headgate during the non-irrigation season. The consumptive use portion (65%) of the water purchased by the State will no longer flow between the dam and the Model headgate. <p>Stockwater. Releases of approximately 70 cfs for 9 days would be released from the reservoir during the non-irrigation season and diverted with river gains at District headgates. Gains occurring outside the period of releases during the non-irrigation season would remain in the river.</p>
<ul style="list-style-type: none"> Arkansas River 	<p>Exchanges by the State will result in temporarily reduced Purgatoire River flows into the Arkansas River. Exchange water will increase flows in the Arkansas River above the confluence with the Purgatoire River. No affect to the Arkansas below the confluence with the Purgatoire River.</p>	<p>The Amendment Alternative is not expected to result in any impact to the Arkansas River.</p>
<p>Prime Farmlands</p>	<p>All prime farmlands within MLIC would remain available for irrigated cultivation. The MLIC has a total of 6,177 acres; a substantial portion has been determined to be prime farmland. However, MLIC is considered to be a "water short" irrigator, i.e. they have insufficient water to</p>	<p>Initially, the City is only expected to dry-up 373.7 acres of the 1,321.7 total acres to be dried-up once full M&I use of Trinidad water occurs. Approximately 247.7 of the 373.7 are classified by NRCS as "prime farmland when irrigated". Of the 805.46 acres to be dried-up in connection with the</p>

Table 3.1 Summary of Environmental Effects.

<u>Resource</u>	<u>No Action Alternative</u>	<u>Amendment Alternative</u>
	adequately irrigate all of the farmland they are permitted to irrigate. As a result, a portion of the MLIC is not irrigated each year, which most likely includes prime farmlands.	State's water purchase, approximately 458 acres are considered "prime farmland when irrigated".
Arkansas River Compact	Because any exchanges conducted by the State are expected to leave the Arkansas River whole below the confluence with the Purgatoire River, the No Action Alternative is not expected to cause material depletions at the state line.	The Amendment Alternative is not expected to result in any hydrologic changes to the Purgatoire River below the District or any changes to the Arkansas River. Consequently, no material depletions at the state line are expected as a result of this alternative.
Threatened & Endangered Species		
• Bald Eagles	No effect – Arkansas River flow changes due to exchanges are outside of winter roosting season. Arkansas River only effected between Lake Meredith and confluence with Purgatoire River – no nesting bald eagles known in this reach of the Arkansas.	Not likely to adversely effect – winter historic return flow releases from Trinidad Reservoir have the potential to enhance aquatic, wetland, and riparian habitat between the reservoir and Hoehne headgate which may benefit wintering bald eagles.
• Piping Plover	Not likely to adversely effect – Potential changes in hydrology due to exchanges would not have measurable adverse effects because they would be brief events that are highly intermittent and would occur when flows are already naturally high, the spring runoff season.	No effect – not known to nest along the Purgatoire River and Arkansas River flows will not be altered.
• Interior Least Tern	No effect – there are no known populations of interior least tern on the effected portions of the Arkansas and Purgatoire rivers.	No effect – not known to nest along the Purgatoire River and Arkansas River flows will not be altered.
• Black-footed Ferret	No effect – environmental effects under no action are expected to be limited to stream channels, outside of habitat for the species.	No effect – there have been no confirmed sightings of the species in Colorado since 1946, therefore it is unlikely they would inhabit any restored grasslands within the District.
• Arkansas Darter	Not likely to adversely effect – minor additional flow during the runoff season would not affect habitat requirements of the darter.	No effect – species is not found in the Purgatoire River basin and Arkansas River flows will not be altered.
• Lesser Prairie-chicken	No effect - environmental effects under no action are expected to be limited to stream channels, outside of habitat for the species.	No effect – only known populations are well outside of the action area.
Recreation	Each successive year after an exchange, no action will contribute progressively less towards achieving the State's desire for a reservoir surface area of 700 to 1,000 acres, because evaporation and seepage won't be replaced until another exchange occurs.	The State's purchase of water rights to be dedicated to replacing recreation pool losses and the City's storage of M&I water would result in higher and more stable average minimum reservoir levels. This will help keep the reservoir surface area at or near the State's desired level longer during the year, and especially during historically low reservoir volume periods such as late summer and fall.
Social and Economic Environment	Negative socioeconomic impacts due to limited water supply (inability to use M&I water from Trinidad Reservoir) is only expected if City of Trinidad population growth is high through 2020;	No socioeconomic impacts are anticipated as a result of the Amendment Alternative – the City of Trinidad will have sufficient water resources for growth through 2020 and beyond. The City will

Table 3.1 Summary of Environmental Effects.

<u>Resource</u>	<u>No Action Alternative</u>	<u>Amendment Alternative</u>
	no impacts are expected if growth is moderate or low.	have to invest in the infrastructure to make use of M&I water in Trinidad Reservoir.
Cultural Resources	Potential hydrologic changes in Arkansas River flow due to State exchanges would not constitute a federal undertaking. Flows would be brief and well within the channel capacity of the river. Consequently, this is not the type of activity that would be expected to cause impacts to cultural resources.	The proposed changes in operations are expected to result in hydrologic changes that are within the range of historic storage and the channel capacity of the river. Consequently, this activity has no potential to cause effects to cultural resources.

HYDROLOGY

Affected Environment

Trinidad Reservoir

Trinidad Dam and Reservoir regulates the flow of the upper Purgatoire River basin for flood control and other purposes. The total capacity of the Reservoir is 123,224 acre-feet (af) of which 51,000 af is reserved exclusively for flood control purposes. The reservoir has an approximate capacity of 71,024 af at the top of conservation pool, but has only reached full capacity of the conservation pool during one year (1999) since it began filling in 1976. Typically, storage peaks during March or April. Irrigation releases begin after mid-April each year and reservoir storage generally declines from this time through September or October when the lowest storage levels typically occur. Storage levels begin building in mid-October until peaking again in March or April.

During the irrigation season, irrigation releases to the river are made pursuant to the District's water rights and in accordance with the Operating Principles. These releases consist of both inflows passed through the reservoir and releases from the reservoir's irrigation storage capacity. During the non-irrigation season, most of the inflows are stored for release during the irrigation season.

Recreation Pool

In 1994, the Corps enlarged the 4,500 af permanent recreation pool after determining that there was unallocated capacity in the reservoir. The permanent recreation pool was increased by 11,467 af for a total of 15,967 af. The State assumed responsibility for securing water to fill the additional pool capacity, while the City remains responsible for maintaining the original 4,500 af. Transmountain water diversion purchases and exchanges were used to fill the additional capacity from 1995 to 1998. No additional purchases and exchanges have occurred since this initial filling. Currently, seepage and evaporation account for an approximately 1,060 af annual reduction in the recreation pool.

Fluctuation of the City's portion (4,500 af) of the recreation pool is typically limited to several hundred acre-feet. The City fills their portion of the recreation pool with Antonio Lopez ditch water rights dedicated to this purpose. However, hydrologic conditions often result in years when only limited amounts of water can be stored under this water right. Consequently, the City's portion of the recreation pool is generally filled under favorable hydrologic conditions and the volume then progressively decreases until hydrologic conditions are again favorable to fill the pool.

Purgatoire River

The Purgatoire River flows 146 miles from Trinidad Reservoir before joining the Arkansas River (Corps 1994). Flows in the Purgatoire River below Trinidad Reservoir are dependent on releases from the reservoir, inflows from tributaries, and return flows from irrigation, M&I and other uses in the basin.

Table 3.2 contains mean monthly streamflow data for the Purgatoire River at four gage sites below Trinidad Reservoir. The first gage (USGS No. 07124410) is just downstream of the Trinidad Dam, the second gage (USGS No. 07126300) is approx. 65 miles below the dam, the third (USGS No. 07126485) is near Rock Crossing (approx. 90 miles downstream of the dam), and the fourth (USGS No. 07128500) is near Las Animas, CO (just upstream of the confluence with the Arkansas River). The table reflects Purgatoire River gage data subsequent to the 1976 completion of the Trinidad Dam.

Table 3.2. Mean Monthly Streamflow in cfs as Recorded at USGS Gages Along the Purgatoire River – 1977 to 2001.

Gage No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
07124410 (Trinidad Dam)	2.69	2.94	3.01	31.9	167	206	178	152	115	24.6	5.61	2.44
07126300 (~65 Miles Below Dam)	29.1	31.1	38.9	90.2	139.6	98.2	88.6	144	60	36.3	34.9	30.6
07126485 (Rock Crossing)	32.6	35	46.1	90.2	133	102	77.8	122	44.3	40.4	40.9	34.5
07128500 (Las Animas, CO)	31.6	31.8	42.4	80.7	134.6	99	77.6	140.6	45.5	35	39.2	30.8

City of Trinidad Municipal and Industrial

The City's demand for M&I water is primarily a function of the municipality's population. Between 1990 and 2000, the City's population grew by approximately 5.8% based on census data (State of Colorado 2003). Prior to this, the City's population had declined after peaking in the 1930's and 1940's. A report prepared for the City (Black and Veatch 2001) projected that the City would experience a growth trend through 2020. The report projected that under a high growth scenario the City may be expected to grow by 3.5% by 2020; under a low growth scenario population would be expected to grow by 2%.

In 2000, the City's estimated average daily demand was 2.88 million gallons per day (mgd), or approximately 3,226 af per year. Delivery of this amount is within the capability of the City's existing supply system, which has a maximum capacity of 5,746 af. Based on the Black and Veatch (2001) data, the City is expected to need approximately 7,975 af under the high growth scenario and 4,693 af under the low growth scenario by 2020.

The City owns a number of John Flood Ditch and MLIC water shares. The City has been given a State water decree for a change in use, irrigation to M&I, and change in the point of diversion, Model Ditch headgate to Trinidad Reservoir. The City has traditionally leased this water back to irrigators along the

John Flood and MLIC ditches. In some cases, the City has entered into long-term agreements with irrigators for use of the City's water. The City is currently using a small amount of its change water rights for augmentation.

Stockwater

Stockwatering is an identified use in the Operating Principles and Operating Criteria. Water may be released from the reservoir inflow in the amount necessary, when added to stream gains below the dam, to make up to 5 cfs (as measured at the State of Colorado's Trinidad gage [PURTRICO] located upstream of the Baca Ditch diversion) available for stockwater diversion. The total reservoir inflow release for stockwatering is not to exceed 1,200 af in any one non-irrigation season.

This method of delivering stockwater has proven to be ineffective in conveying water to stock ponds. Often during the non-irrigation season, there are minimal flows in the Purgatoire River below Trinidad Reservoir. When releases are made for stockwater, transit and evaporation losses deplete the releases before they reach the intended stock ponds. Soils in the unlined ditches are often dry and unsaturated at this time of year (Jan.-April) and are capable of absorbing a significant amount of the stockwater. In addition, the width of some of the District canals (ex.: Baca is ~10 ft.; Enlarged South Side is ~21 ft.) further diminishes the effectiveness of the 5 cfs stockwatering deliveries, because these relatively wide ditches disperse the flow over more soil surface, which increases the transit losses.

Because there is not sufficient flow to transport water to stock ponds, water is being diverted into ditches and cattle are allowed to drink from pools in the ditches. Cattle accessing water in the ditch, and associated hoof action on the soils, degrades the ditches, increases seepage, which further decreases the effectiveness of deliveries to stock ponds.

No Action Alternative

Trinidad Reservoir

- **M&I** – The existing Operating Criteria do not provide for current and future use of the City's changed water rights for M&I use. As a result, the City would most likely continue to lease the majority of their water to irrigators for agricultural uses, for the foreseeable future. Because the City would not be storing water in their Trinidad Reservoir account and this water would continue to be used for irrigation, this particular component is not expected to measurably alter Trinidad Reservoir storage and release patterns.

The City would be expected to continue to seek the means to use this water for M&I purposes because of their long-term involvement and investment in securing this water source. Because the nature of any future Trinidad M&I or other water use are undetermined, the effects of these actions cannot be predicted.

- **Recreation Pool** – The recreation pool volume would be expected to fluctuate several thousand acre-feet under no action due to the lack of a dedicated supply to replenish pool losses. The State would most likely seek water exchanges to replace losses to their portion of the recreation pool. The most likely source of water for an exchange would be transmountain diversions that can be diverted to the Arkansas River. An exchange of this nature requires a number of favorable hydrologic conditions to occur in order to successfully exchange this water to Trinidad Reservoir. In general, the State would purchase transmountain diversion water to make the Arkansas River "whole" in exchange for storing water in Trinidad Reservoir's recreation pool. Based on their experience with initially filling their portion of the recreation pool, the State estimates that in wet years conditions for exchanges may occur 4 out of 10 years (Pers. Comm. Paul Flack 2003). In

normal and dry years, the opportunity to successfully execute an exchange is expected to be less than in wet years. Limited opportunities to exchange water may result in significant declines in the recreation pool volume between exchange fillings. Estimates indicate that evaporation and seepage result in an average annual depletion of 1,060 af from the recreation pool (U.S. Army Corps of Engineers 1994). Consequently, during the timeframes when exchanges are not available, the pool volume may drop by several thousand acre-feet.

- Stockwater – Stockwater releases would continue to be limited to the provisions in the existing Operating Principles and Operating Criteria, i.e. releases at a rate of 5 cfs or less not to exceed 1,200 af. A portion of the 1,200 af allowed for stockwatering is expected to be used even though the effectiveness of the current stockwatering practice is limited. Unused portions of the 1,200 af available for stockwatering would remain in the reservoir irrigation capacity and be used for irrigation during the irrigation season.

Purgatoire River

- M&I – The existing Operating Criteria do not provide for current and future use of the City's changed water rights for M&I use, although minor amounts are being used for augmentation. Therefore, this is not expected to result in any change in Purgatoire River flows. The historic irrigation return flows to the Purgatoire River associated with Trinidad's John Flood and MLIC water rights, in particular, would be maintained because the subject water will most likely be leased back to irrigators.
- Recreation Pool – The State will most likely not proceed with purchase of the MLIC water rights if the Operating Principles and Operating Criteria are not amended to allow the State to use MLIC irrigation water to replenish the recreation pool. MLIC would retain ownership of the water rights and would be expected to continue to use the water for agricultural purposes. Although MLIC has removed acreage from production in anticipation of this water sale, they are a water short irrigator and could still make full agricultural use of the water being considered for sale. Consequently, no change in Purgatoire River flows is anticipated since this water would be expected to be used in a manner similar to past practices.

When the State conducts a water exchange, water would be diverted and stored in Trinidad Reservoir. This will reduce flows in the Purgatoire River below Trinidad Reservoir. Exchanges typically occur during the peak of spring runoff, therefore during an exchange Purgatoire River flows would most likely be affected sometime during the mid-April to mid-June timeframe. Exchanges would typically only be necessary for a few days, when conditions are appropriate, to replenish the State's portion of the recreation pool (Pers. Comm. Paul Flack 2003).

- Stockwatering – Gains (typically less than 3 cfs) to the Purgatoire River below the Trinidad Dam and above the Trinidad gage, which can be diverted for stockwater use, will most likely only be diverted occasionally for stockwatering purposes under no action. Although the current stockwatering methods are not very effective, some diversion and use of the water is expected to continue. Any gains that are not diverted would remain in the river and be available for use by water districts and diverters downstream of the District. Essentially, current patterns of stockwater use would continue and no change in Purgatoire River flows would be expected due to stockwatering under no action.

Arkansas River

The State is expected to seek water exchanges to replenish their portion of the recreation pool. These exchanges will most likely involve working with Colorado Springs Utilities to exchange water in Lake Meredith for storage of native flows in Trinidad Reservoir's recreation pool. At the time that water

begins to be diverted and stored in the recreation pool under the exchange, releases would be made from Lake Meredith to the Arkansas River. The Arkansas River would therefore be made "whole" below the confluence of the Purgatoire and Arkansas rivers. The release of exchange water from Lake Meredith will result in a net increase in Arkansas River flows below Lake Meredith and above the confluence of the Arkansas and Purgatoire rivers. Exchanges are most likely to occur between mid-April and mid-June and the exchange would probably occur over several days (Pers. Comm. Paul Flack 2003).

Amendment Alternative

Trinidad Reservoir

- M&I – Initially, the City is only expected to use a small portion of their John Flood and MLIC water rights, and therefore will only need a portion of their Trinidad Reservoir storage capacity. At the outset, the City plans to continue augmenting well use by using their Trinidad water rights. The City would use water from three wells for non-potable water uses, such as watering school and park lawns. The water from these wells is considered a depletion of the Purgatoire River. Consequently, the City would augment Purgatoire River flows by making releases from Trinidad Reservoir to replace water used from the wells. The maximum amount of water to be used for this purpose is 60 af. To meet this need, the City would store the necessary amount of water in their Trinidad Reservoir capacity and release it as needed.

The City also has an agreement with Coastal LLC to provide raw water for a golf course. Water would be diverted directly from the Purgatoire River and used to water the golf course. At this time, construction of the diversion and golf course has not occurred. It is difficult to determine when construction of these facilities will occur and use of water will begin. The developer was originally scheduled to begin diverting water in September of 2003. Once this need is developed, water will be stored in the City's Trinidad Reservoir capacity and released as needed for direct diversion and use on the golf course.

Finally, the City does not currently have the facilities necessary to convey water from Trinidad Reservoir to their existing water treatment plant. In addition, the existing water treatment plant would need to be expanded to be capable of treating water from Trinidad Reservoir in addition to their current water supplies. A report prepared for the City, Black and Veatch (2001) recommended that a new water treatment facility be constructed to treat Trinidad water, rather than expanding the existing facility. The City supports this recommendation, and has begun the initial project planning for construction of a new water treatment plant. However, a number of major project planning and administrative steps must still be completed to undertake the project, including passing resolutions to proceed with this project, developing funding for the project, and site selection and acquisition. The high potential for variability in the outcomes of these initial planning steps suggests that the City's use of Trinidad water in a water treatment plant is not yet a reasonably foreseeable action. Consequently, use of the majority of the City's reservoir capacity is not expected to occur for a number of years.

When the City uses Trinidad Reservoir M&I water, the City's storage account would accrue water for later M&I releases. Water in this account would be released as the City needs it. Unlike irrigation water, M&I water is typically released year-round rather than just during the irrigation season. This would result in more water volume in the reservoir during late-summer, fall and winter months.

- Recreation Pool – Under the Amendment Alternative, that portion of the MLIC water rights to be purchased by the State would accrue to the recreation pool rather than the irrigation capacity. Accrual of water in the recreation pool would be greatest during spring months, and lower during

all other times of the year. Consequently, the pool would probably be fullest at the beginning of summer and lose volume until the following spring fill begins. Fluctuation in the pool volume would probably be limited to several hundred af, assuming that annual reservoir inflows are sufficient to replace all or most of the annual estimated evaporation and seepage losses of 1,060 af. The net effect of this action is consistently higher reservoir elevations throughout the year.

- Stockwatering – Under the Amendment Alternative, the full 1,200 af available for stockwatering is expected to be delivered. The District anticipates that releases of approximately 70 cfs would be made for stockwatering, and result in approximately 9 days of releases. Reclamation modeled these releases assuming three 3-day releases of approximately 70 cfs (Appendix A). The model indicated that the reduced reservoir surface area after these stockwater releases resulted in less evaporation. Because there would be less evaporation after these stockwater releases and there would be more evaporation without these releases, the effects of the releases on reservoir content decrease over time.

Given that a portion of the stockwater allowance is expected to be used under no action and that reduced evaporation “boosts” reservoir content after releases, stockwatering under the Amendment Alternative is expected to only slightly decrease non-irrigation season reservoir content.

Purgatoire River

- M&I – There would be no impact to the Purgatoire River below the Hoehne headgate (13 miles below Trinidad Dam) and most likely only minor changes to river flows between the dam and Hoehne headgate as a result of the M&I amendments, for the following reasons:
 1. Regardless of whether the City uses all or only part of their John Flood and MLIC water rights, the historic return flows associated with the historic agricultural use of this water is protected. The City’s water decree requires that when they store M&I water, releases must be made from the reservoir in quantity (35% of the total water considered) and timing similar to agricultural historic return flows. Agricultural return flows are believed to accrue to the Purgatoire River beginning at and downstream of the Hoehne headgate. Consequently, there should be no impact to the Purgatoire River below Hoehne headgate due to M&I amendments.

The 35% historic return flows are broken down into 25% irrigation season return flows and 10% winter return flows. The irrigation season return flows (25%) represent no major change in flow patterns for the Purgatoire River. The non-irrigation season return flows of 10% do represent a change in flow patterns. When derived from irrigation as under the no action, these return flows would reach the river below the Hoehne headgate during the non-irrigation season. Under the Amendment Alternative, these return flows will be released from the reservoir during the non-irrigation season and supplement flows in the 13 mile reach upstream of the Hoehne headgate.

2. The City is expected to continue to lease back a portion, possibly a majority, of their water rights for agricultural use, because the City’s use of M&I water from Trinidad Reservoir will most likely be limited for the reasonably foreseeable future. Currently, the City only has firm plans to make use of a portion of their John Flood and MLIC water rights by making releases to augment their well use and potentially to fulfill an agreement to provide releases for watering a golf course (see the M&I component under Trinidad Reservoir above for more detail on the City’s anticipated water use). Consequently, little or no change in Purgatoire River flow is expected, and no change in flow downstream of the District would occur.

- However, when the City does store water for M&I purposes, the reduced irrigation releases will reduce flows in the Purgatoire River between the dam and the MLIC headgate, an eight-mile reach, during the irrigation season.
3. No additional return flows to the Purgatoire River are expected as a result of the City's M&I water use available under this alternative. Water decree No. 88CW061 allows the City to use the consumptive portion of the water right to extinction, or in other words re-use the water to the point that no return flows reach the Purgatoire River. The City has, in fact, proposed to re-use the water once they begin using it. Water released from the waste water treatment plant into the Purgatoire River would be diverted approximately 1.5 miles downstream to irrigate a golf course.
- Recreation Pool – Similar to the M&I amendments, the recreation pool amendments would have no effect on Purgatoire River flows below the Hoehne headgate, but would change river flows between Trinidad Dam and the MLIC headgate. (approximately eight miles).
 1. Under the Amendment Alternative, the State would be allowed to use that portion of the water removed from irrigable lands that is considered the consumptive use portion, which has been determined by the State to be 65% of the water right. The historic return flows attributed to the Purgatoire River, estimated at 35%, would be released from Trinidad Reservoir at a rate and time similar to historic return flows to keep the river "whole" or maintain historic flows in the river. Consequently, the recreation pool amendments will have no effect on the Purgatoire River below the Hoehne headgate, the beginning point of historic return flows.
 2. Purgatoire River flows between the Trinidad Reservoir outlet and the diversion for the Model Ditch, a distance of roughly eight river miles, will continue to flow with the 35% historic return flows, but will no longer have flows related to the 65% of consumptive use water transferred to the recreation pool. This water would have been in this eight mile stretch of the river during the irrigation season, and involves of a maximum of 700 af annually.
 3. The 35% historic return flows are broken down into 25% irrigation season return flows and 10% winter return flows. The irrigation season return flows (25%) represent no major change in flow patterns for the Purgatoire River. The non-irrigation season return flows of 10% do represent a change in flow patterns. When derived from irrigation as under the no action, these return flows would reach the river below the Hoehne headgate during the non-irrigation season. Under the Amendment Alternative, these return flows will be released from the reservoir during the non-irrigation season and supplement flows in the 13 mile reach upstream of the Hoehne headgate.
 - Stockwater – Under the Amendment Alternative, multiple "slugs" of water would be released from the reservoir for stockwatering purposes. The releases are anticipated to occur in multi-day (2-3) releases, two to three times during the non-irrigation season. Historically, releases for stockwatering were often around 80 cfs, however the District expects there may be a need for releases as high as 100 cfs. The total quantity of water available for releases would remain at 1,200 af, just as under the no action alternative. Therefore, at a rate of 100 cfs, the 1,200 af would be depleted in approximately six days. At 70 cfs, the 1,200 af would be depleted in approximately nine days.

During those days that stockwater is diverted, the gains to the Purgatoire River between Trinidad Dam and the Trinidad Gage (generally less than 3.5 cfs) would also be diverted. If stockwater

diversions are made for six to nine days, there would be no gains downstream of the diversion point during those days. (The diversion point will vary depending on which ditch/headgate is used to deliver the stockwater.) However, the gains would not be diverted for approximately 141-144 days during the non-irrigation season and would continue downstream.

Arkansas River

The three Amendment Alternative elements are not expected to result in any impact to the Arkansas River.

PRIME FARMLANDS

The Farmland Protection Policy Act of 1980 and Council on Environmental Quality guidance issued in 1980 direct Federal agencies to evaluate the impact of their actions on prime farmlands.

Affected Environment

The MLIC has a total of 6,177 acres, a portion of which are prime farmland. The prime farmland designation for these acres is contingent upon irrigation water, i.e. if the lands are not irrigated, the soils themselves do not meet the criteria for designation as prime farmland.

The City has acquired 43 percent of the Johns Flood water rights over the years, beginning in 1981. The City typically leases this water for irrigation purposes on a year-to-year basis to various farmers that use the Johns Flood ditch system (the Johns Flood Ditch Company was dissolved in 1985). It is likely that some of the acreage that has been irrigated in the past with Johns Flood water leased from the City was used on prime farmland. However, there is no specific irrigable acreage associated with this lease water, which is subject to change in location of use annually and has changed over time.

No Action Alternative

All prime farmlands within MLIC would remain available for irrigated cultivation. The MLIC does not hold sufficient water rights to adequately irrigate all of their lands in most years. Consequently, it is reasonable to expect that some of the MLIC farmlands will experience short or long-term dry-up due to changes in operations to address water shortages and unfavorable hydrologic conditions.

Continued delivery of the City's Johns Flood lease water to irrigators could mean that prime farmlands that would otherwise not be irrigated, would receive water. Delivery of this water will not have a direct impact on maintaining or losing prime farmland on the whole.

Amendment Alternative

Initially, the City's use of M&I water from Trinidad Reservoir is expected to be limited. Full development of this water source is expected to be several years in the future. The portions of the City's water that are not used for M&I purposes are to be leased back to irrigators for agricultural use. When there is a request for delivery of M&I water, the City is required to notify the District to inform them of which lands in the District will be dried-up in connection with the M&I deliveries. The number of acres to be dried-up is proportionate to the number of acre-feet being used for M&I purposes. The City's subject water rights indicate that for the 2,802 af of water secured by the City, dry-up of 1,321.7 acres will be required. Specific parcels to be dried-up are not specified. Initially, the City has indicated the need to dry-up 373.7 acres in response to M&I water use, and has identified specific parcels for this purpose (Wheeler 2002). Approximately 247.7 of these acres are classified by the Natural Resource Conservation Service (NRCS) as prime farmland when irrigated. There is some potential for the specific lands identified for dry-up by the City to change from year to year, because the water decree does not

identify specific lands for dry-up. If this occurs, the portion of dry-up acreage that is prime farmland when irrigated will also vary.

Under the Amendment Alternative, the State is expected to implement their agreement with MLIC for transfer of certain water rights. The agreement involves the transfer of 700 af of water, which is calculated to be the equivalent water used to irrigate 805.46 acres. The agreement for this transaction identifies specific acres to be dried-up. Of the 805.46 acres to be dried-up, approximately 458 acres are considered prime farmland when irrigated. Note that completion of this transfer is dependent on the issuance of a water decree for the change in ownership, use and diversion of the subject water.

The stockwatering component of the Amendment Alternative is not expected to have any direct effects on prime farmland.

The primary significance of removing prime farmland from production is often the economic impact on individual farmers from losing their most productive lands and loss of the nation's most economically productive farmlands. However, the Amendment Alternative is not expected to involve impacts in either of these respects with regards to the MLIC lands. In this case, the land owner has willingly identified those lands that provide the least benefit to the farms operations. Although they may include prime farmland, the identified lands have features, such as excessive erosion and high ditch maintenance costs, that make them the least attractive lands for the farmer to cultivate. Consequently, changing the land use on these lands does not negatively affect the farmer, instead the farm operator can recognize economic gain from the sale of water associated with those lands and improved operational efficiency by removal of the farmer's least economically viable lands.

The City's future use of the Johns Flood water for M&I purposes will mean that less water is available to lease for irrigation purposes. Johns Flood lease water is not dedicated to specific lands and therefore any specific effects of not delivering irrigation water cannot be determined. However, less availability of irrigation water is not expected to result in the loss of prime farmlands or preclude the use of any prime farmlands; they can still be cultivated and irrigated.

ARKANSAS RIVER COMPACT

Affected Environment

The Arkansas River Compact (Compact) was enacted into law by Congress in 1949 for the purpose of settling disputes, avoiding future conflict and equitably apportioning the waters of the Arkansas River between the states of Colorado and Kansas. The Compact is not intended to impede or prevent future development of the Arkansas River basin, as long as the waters of the Arkansas River are not materially depleted in usable quantity or availability for use to water users in the states of Colorado and Kansas. The Compact also established the ARCA to administer the Compact. ARCA is a signatory to the Trinidad Reservoir Operating Principles. ARCA approves amendments to the Operating Principles, which also must be approved by the other signatories to the Operating Principles (Reclamation, Corps, the District, and the State of Kansas).

No Action Alternative

Operation of the irrigation capacity and recreation pool would remain essentially the same as they are currently. No change in the hydrologic regime for the Purgatoire River below Trinidad Dam and Reservoir is expected and any exchanges conducted by the State are expected to leave the Arkansas River "whole". As a result, there are no depletions to the Arkansas River or other

hydrologic effects associated with the No Action Alternative that are expected to result in a material depletion.

Amendment Alternative

Amendment of the Operating Principles to allow M&I use by the City of Trinidad was approved by the signatories to the Operating Principles in 1998. On May 23, 2003, ARCA adopted amendments to the Operating Principles that would permit the irrigation capacity to be used to replace evaporation and seepage from the permanent fishery pool. Finally, ARCA adopted amendments to the Operating Principles that permit the proposed operational changes for stockwatering on December 9, 2003. ARCA's approval of the proposed actions indicates that ARCA members do not expect that these amendments to the Operating Principles will result in material depletions. The analysis described in the Hydrology section of this chapter also concludes that the Amendment Alternative will not result in any material depletions. The three components of the proposed action are not expected to result in hydrologic changes to the Purgatoire River downstream of the District or any change in the hydrology of the Arkansas River.

THREATENED AND ENDANGERED SPECIES

Affected Environment

Four species listed as threatened or endangered under the Endangered Species Act (ESA) may be present in the action area. Two species have been identified as candidates for listing. No critical habitat has been designated nor proposed in the action area. The Fish and Wildlife Service (FWS) concurred with this species list on July 31, 2003.

Threatened or Endangered Species

Bald eagle (<i>Haliaeetus leucocephalus</i>)	Threatened
Piping plover (<i>Charadrius melodis</i>)	Threatened
Interior least tern (<i>Sterna antillarum</i>)	Endangered
Black-footed ferret (<i>Mustela nigripes</i>)	Endangered

Candidate Species

Arkansas darter (<i>Etheostoma cragini</i>)
Lesser prairie-chicken (<i>Tympanuchus pallidicinctus</i>)

Bald Eagle

Bald eagles are large, opportunistic birds of prey that feed largely upon fish and waterfowl. Bald eagles are associated with rivers, lakes, and reservoirs where large trees provide perch sites for roosting and for locating and securing prey. Fish are the primary source of food. Under adverse conditions, bald eagles will search for prey in upland areas and will also feed on carrion. If severe winter conditions persist, bald eagles will concentrate in areas with open water or migrate further south.

Nesting and wintering bald eagles are found in close association with water that provides a reliable food source and isolation from human disturbance. Bald eagles wintering in Colorado are thought to originate in the central provinces of Canada and the Great Lakes states. Migrant and wintering bald eagles begin to arrive in the Arkansas River basin in mid- to late-October and begin to leave the area for breeding areas in the north by early March. Adult migrants tend to winter repeatedly in the same area but remain mobile when seeking food during changing winter weather conditions. The Colorado Division of Wildlife

(CDOW) (2003) estimates that approximately 800 bald eagles winter in Colorado. Wintering and migrating bald eagles can be expected to occur throughout the lower Arkansas River basin.

Bald eagles nest near rivers, lakes, and reservoirs where they select nesting sites free from disturbance. Cottonwood trees are preferred nesting trees in the lower Arkansas River basin. Nests are large and re-used annually. Nesting activities begin in early to mid-March, eggs are laid in late March to early April, and both adults incubate the eggs. Eggs hatch in mid-May and fledging takes place after ten to eleven weeks with immature birds remaining near the nest for another six weeks. The number of active bald eagle nests is increasing in Colorado. In 2001, there were about 51 nesting pairs (CDOW 2003). There are no known active nests in Las Animas County (Pers. Comm. Jeremy Gallegos 2003). The bald eagle has been downlisted to threatened and has been proposed for de-listing.

Piping Plover

The piping plover is a migratory shorebird that breeds along prairie rivers, alkali lakes and ponds of the northern Great Plains, on sandy beaches along the Great Lakes, and on the beaches of the Atlantic coast. Its primary food is aquatic invertebrates. Piping plover populations have fluctuated drastically since 1900 primarily as the result of market hunting. Populations rebounded by the 1920s; however, human encroachment, an increase in the recreational use of sandbars and beaches, channelization and impoundment of rivers, and the resultant modification and destruction of habitat have caused numbers to decline again.

The piping plover is one of three small plovers that can be found in Colorado. In eastern Colorado, piping plovers occur primarily as migrants and arrive in early April. Most non-breeding piping plovers leave Colorado by the end of May.

The piping plover's historic breeding habitat in eastern Colorado included the South Platte and Arkansas rivers. Piping plovers can also be found breeding on sandy lake and reservoir shorelines, river sandbars, and sandy wetland pastures. Breeding piping plovers arrive in eastern Colorado in late April. Piping plovers are known to nest with interior least terns at John Martin Reservoir on the lower Arkansas River (Pers. Comm. Kevin Kaczmarek 2003). The piping plover is listed as threatened.

Interior Least Tern

The interior least tern is the smallest member of the tern family and breeds in southeastern Colorado in the La Junta-Lamar area and in colonies of piping plovers at John Martin Reservoir (Pers. Comm. Kevin Kaczmarek 2003). Breeding least terns are normally associated with unvegetated shorelines, sandbars, and mudflats of rivers and reservoirs. The occurrence of breeding least terns is localized and is highly dependent upon the presence of dry, exposed sand and gravel bars and favorable river flows that support a forage base and isolate the bars from the banks. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sand and gravel bars within a wide, unobstructed, water-filled river channel. This swallow-like aquatic bird feeds primarily on small fish, such as shiners (*Notropis* spp.) and plains killifish (*Fundulus kansae*), from shallow water in rivers and lakes.

Least terns arrive on breeding sites in mid-May. Both sexes share egg incubation that takes 19 to 25 days. Winter habitat for the interior least tern is currently unknown. The interior least tern is listed as endangered.

Black-footed Ferret

The black-footed ferret is a small carnivore about the size of a mink and is considered to be the most endangered mammal in North America. The historic range of the black-footed ferret coincides with that of the three species of prairie dogs upon which it depends for food and shelter and includes the short and mid-grass prairies of the Great Plains (Schroeder 1987). Black-footed ferrets inhabit prairie dog towns

utilizing abandoned burrows with approximately 90% of their diet consisting of prairie dogs. The remainder of their diet is composed of mice, ground squirrels, rabbits, rats, birds, reptiles, and insects. The demise of the black-footed ferret in the mid-1900s coincided with attempts to rid the Great Plains of prairie dogs. What was believed to be the last known black-footed ferret died in 1979 in captivity in South Dakota and the species was presumed extinct until it was rediscovered in Wyoming in 1981 (Nebraska Game and Parks Commission 1996). The last record of a black-footed ferret in Colorado was from 1946 (CDOW 2003).

Historically, black-footed ferrets were never abundant (because few people saw or recorded them) in Colorado, but they likely ranged statewide. Prairie dog towns/complexes consisting of more than 80 acres within four miles of one another should be surveyed for the presence of black-footed ferrets (FWS 1993). Small isolated prairie dog colonies are located north and east of Trinidad Reservoir (Pers. Comm. Kevin Kaczmarek 2003). The black-footed ferret is listed as endangered.

Arkansas Darter

The following information was taken from the CDOW webpage (http://wildlife.state.co.us/species_cons/index.asp). The Arkansas darter is a three-inch member of the walleye and perch family. Its body displays 12 to 14 dusky stripes along the sides with fine black specks on the back and a dark, vertical wedge-shaped spot beneath the eye. During the April-May breeding season, males display bright orange underneath.

Arkansas darters feed on a variety of aquatic invertebrates and plant material including small seeds. They prefer shallow, clear streams with sandy substrates, spring-fed pools, and abundant rooted aquatic vegetation.

Arkansas darters may spawn throughout spring and summer. Spawning takes place in shallow water over a bottom of coarse gravels. Eggs are usually deposited in open areas on organic material covering sandy substrates. Arkansas darters become sexually mature in a year or less.

The Arkansas darter has a very restricted natural range and is the only darter native to the Arkansas River drainage. It is found only in tributaries to the Arkansas River in Colorado, Kansas, Missouri, and Oklahoma. The species is found in the upper Arkansas River, springs adjacent to Fountain Creek, Horse Creek, upper Arkansas River at John Martin Reservoir, Big Sandy Creek, Rush Creek, Black Squirrel Creek, and Chico Creek drainages. The darter has never been recorded from the Purgatoire River drainage and appears to be restricted to Arkansas River tributaries that enter the river from the north (Pers. Comm Jim Melby 2003).

Arkansas darters are susceptible to predation by introduced fish and degradation of water quality. The Arkansas darter is a candidate species.

Lesser Prairie-chicken

The following information was taken from the CDOW webpage (http://wildlife.state.co.us/species_cons/index.asp). The lesser prairie chicken is mostly brown in color with horizontal barring, short rounded tails and about the size of a small chicken. Males have reddish air sacs on their necks that are inflated during mating courtship displays. Lesser prairie chickens historically occupied the grasslands of Texas, Oklahoma, New Mexico, Kansas, and southeastern Colorado. They prefer sandy grasslands having an abundance of mid-height grasses, sandsage, and yucca. During summer, they feed on grasshoppers and other insects. During winter, their food source consists of seeds, leaves, grain, and milo from agricultural areas.

Lesser prairie chickens are polygamous with males attracting females to leks with elaborate dancing

displays. Males also inflate their red air sacs and display their yellow combs. Hens typically lay 12 eggs.

Populations have declined as a result of conversion of grasslands and overgrazing. In Colorado, most of the birds are found in the Comanche National Grassland near the Town of Campo in the southeastern corner of the state. Smaller groups of birds are found south of the Town of Holly, east of the Town of Eads, and south of the Cimarron River. One group of birds was released in sandsage-yucca habitat east of the City of Pueblo in an effort to establish another population. The lesser prairie chicken is not found in Las Animas County (Pers. Comm. Kevin Kaczmarek 2003). The lesser prairie chicken is a candidate species.

No Action Alternative

As described in the Hydrology section, exchanges conducted by the State to replenish their Trinidad Reservoir recreation pool would reduce flows in the Purgatoire River between Trinidad Reservoir, when flows are stored, and the Arkansas River when they store and exchange flows. Flows in the Arkansas River between Lake Meredith and the confluence of the Arkansas and Purgatoire rivers (a river distance of approximately 40 miles) would increase when exchanged flows are released to replace stored water at Trinidad Reservoir. These exchanges are expected to occur during spring run-off (mid-April to mid-June) and to take a few days to complete. Environmental and administrative conditions permitting exchanges are estimated to occur a possible 4 out of 10 years in wet years and less in average and dry years based on the State's past experience.

The No Action Alternative is not expected to result in any other hydrologic or operational changes within or outside of the District.

Bald Eagle

The No Action Alternative would have no effect on bald eagles because changes in flows associated with exchanges are expected to occur outside of the winter roosting season for bald eagles in the Arkansas Basin and there are no known nesting bald eagles in the effected reach.

Piping Plover

Piping plover are known to breed at John Martin Reservoir and may breed along the Arkansas River upstream of John Martin Reservoir. Piping plover at John Martin Reservoir would not be affected by exchanges because the Arkansas River will be "whole" or unaffected below the confluence of the Arkansas and Purgatoire rivers. Since piping plover generally arrive in the Arkansas Valley in late April, there is potential for changes in Arkansas River flows due to exchanges to affect nesting piping plover upstream of John Martin Reservoir. However, because the exchanges will be relatively brief events (most likely limited to a few days), highly intermittent (only in years when all conditions are appropriate, which will most likely only be certain wet years) and occur early in the breeding/nesting season during the spring run-off season (high flow period), piping plover may be affected, but are not likely to be adversely affected because any potential changes in hydrology would not have measurable adverse effects on nesting plovers. In addition, it is important to note that during high flow years, sand and gravel bars used by piping plover are typically partially or entirely submerged, forcing birds to nest at the highest suitable elevations and less likely to be affected by minor increases in flows.

Interior Least Tern

There are no known populations of nesting least terns along the affected portions of the Purgatoire or Arkansas rivers. However, if nesting terns are present and nesting on the Arkansas River upstream of John Martin Reservoir during exchanges, effects would be similar to those described for plovers and are not likely to adversely affect interior least tern.

Black-footed Ferret

The no action would have no effect on black-footed ferrets because the effects under no action are expected to be limited to stream channels, outside of the habitat for the species.

Arkansas Darter

Because the exchanges are expected to be relatively brief events (most likely limited to a few days), highly intermittent (only in years when all conditions are appropriate, which will most likely only be certain wet years) and occur during the spring run-off season (high flow period), Arkansas darters are not likely to be adversely affected because minor additional flow during the runoff season would not affect habitat requirements of the darter.

Lesser Prairie-chicken

Stream channel effects resulting under no action would be well outside the known habitat for this species; no effect to the species would occur.

Amendment Alternative

On February 20, 2004, the FWS concurred with the following findings related to threatened, endangered and candidate species within the action area.

Bald Eagle

The eagle may occasionally visit the Purgatoire River valley and Trinidad Reservoir during winter. Once water is used for M&I and recreation pool purposes and non-irrigation season historic return flow releases are being made from the reservoir, there will be higher flows in the reach of river (a maximum of 3.2 cfs in winter) between Trinidad Dam and the Hoehne Headgate (13 river miles below the dam and where return flows to the river are assumed to begin) during the non-irrigation season, enhancing aquatic, wetland, and riparian habitat necessary to support prey species utilized by eagles.

The proposed recreation pool and stock watering changes have the potential to individually affect the recreation pool and irrigation capacity, but cumulatively the proposed changes result in no adverse effect to the elevation level of Trinidad Reservoir. Recreation pool use of water from the irrigation capacity to replace evaporation and seepage will maintain higher winter storage levels in Trinidad Reservoir. Stock water releases are currently only partially used, but under the proposed action, full use of the 1,200 af allowance is expected. This would result in an annual reduction in reservoir volume of several hundred acre-feet during the winter months. Therefore, when considered together, these actions will very nearly or fully offset each other. Consequently, they are expected to result in either no effects or possibly a minor increase in storage.

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action may affect but not adversely affect (beneficially affect) the bald eagle.

Interior Least Tern and Piping Plover

These two species are addressed in common because of their similarity in habits and habitat requirements. Terns and plovers nest at John Martin Reservoir on the Arkansas River downstream of its confluence with the Purgatoire River. Neither species is known to nest along the Purgatoire River (Pers. Comm. Kevin Kaczmarek 2003). There would be no change in flows in the Purgatoire River below the District during the months when terns and plovers would be nesting at John Martin Reservoir.

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the interior least tern or the piping plover.

Black-footed Ferret

Ferrets cohabitate with prairie dogs in large colonies. Only small, isolated prairie dog colonies are located within the action area and those occur outside of the District. The proposed action does include activities that would encourage changes in land use from cultivated use to grassland or pasture use within the District. This change in land use could create potential habitat for prairie dogs, that might result in potential black-footed ferret habitat.

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the black-footed ferret. We anticipate potential development of prairie dog and black-footed ferret habitat. However, since there have been no confirmed sightings of ferrets in the state since 1946, it is unlikely that ferrets would inhabit the restored grasslands.

Arkansas Darter

The Arkansas darter is not found in the Purgatoire River basin (Pers. Comm. James Melby 2003). The proposed action is not expected to alter Arkansas River flows.

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the Arkansas darter.

Lesser Prairie-chicken

The lesser prairie-chicken is not known to occur in Las Animas County. The closest known populations are found in Baca County.

Based upon the analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the lesser prairie-chicken.

SPECIES OF CONCERN**Affected Environment**

The State of Colorado has designated certain wildlife species that have low or declining populations within the State as state endangered (SE), state threatened (ST), or state species of special concern (SC). (Species listed by both the State of Colorado and the federal government are addressed in the Threatened and Endangered Species section.) The following species designated by the state are known to occur or are likely to occur in the action area for the proposed action.

Swift fox	<i>Vulpes velox</i>	SC
Northern pocket gopher	<i>Thomomys talpoides macrotis</i>	SC
Botta's pocket gopher	<i>Thomomy bottea rubidus</i>	SC
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	SC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC
Northern river otter	<i>Lontra canadensis</i>	ST
Long-billed curlew	<i>Numenius americanus</i>	SC
Wolverine	<i>Gulo gulo</i>	SE
Greater sage grouse	<i>Centrocercus urophasianus</i>	SC
Mountain plover	<i>Charadrius montanus</i>	SC
Peregrine falcon	<i>Falco peregrinus anatum</i>	SC

Ferruginous hawk	<i>Buteo regalis</i>	SC
Greater sandhill crane	<i>Grus canadensis tabida</i>	SC
Western yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC
Burrowing owl	<i>Athene cunicularia</i>	ST
Plains sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	SE
Plains minnow	<i>Hybognathus placitus</i>	SE
Suckermouth minnow	<i>Phenacobius mirabilis</i>	SE
Flathead chub	<i>Platygobio gracilus</i>	SC
Great plains narrowmouth toad	<i>Gastrophryne olivacea</i>	SC
Plains leopard frog	<i>Rana blairi</i>	SC
Yellow mud turtle	<i>Kinosternon flavescens</i>	SC
Triploid checkered whiptail	<i>Cnemidophorus neotesselatus</i>	SC
Massasauga	<i>Sistrurus cantenatus</i>	SC
Texas horned lizard	<i>Phrynosoma cornutum</i>	SC

No Action Alternative

The majority of species listed by the State of Colorado as likely to occur or known to occur in the project area would not be impacted by the No Action Alternative, because they are species that would not be impacted by minor hydrologic changes, such as the burrowing owl, swift fox, or Texas horned lizard. Species that could be imperiled by hydrologic changes expected to occur as result of the State's water exchanges from Lake Meredith to Trinidad Reservoir, specifically the plains minnow, suckermouth minnow, flathead chub, yellow mud turtle, and northern river otter, are not expected to be substantively impacted. The changes due to the exchanges will result in Arkansas and Purgatoire river flows and Trinidad Reservoir storage that are well within the historic flow and reservoir storage ranges. In addition, the changes would be short-term (a few days), result in relatively minor flow changes, and occur approximately four out of ten years. Consequently, any impacts to these species would be expected to be minor.

Amendment Alternative

The majority of species listed by the State of Colorado as likely to occur or known to occur in the project area would not be impacted by the Amendment Alternative, because they are species that would not be impacted by hydrologic or potential land changes expected under the Amendment Alternative. The plains minnow, suckermouth minnow, flathead chub, yellow mud turtle, and the northern river otter may be present in the reach of the Purgatoire River (Trinidad Dam to Hoehne headgate) or Trinidad Reservoir where hydrologic changes would occur as a result of the Amendment Alternative. However, the relatively minor change in flows and patterns of storage would not be expected to adversely impact these species, because the changes are well within the historic flow and reservoir storage ranges. A few species, such as the northern pocket gopher, Botta's pocket gopher, black-tailed prairie dog, and plains sharp-tailed grouse, may be able to occupy lands that would no longer be cultivated due to the City's purchase of irrigation water for M&I use if lands are allowed to revert to grasslands.

RECREATION

Affected Environment

In 2001, the Trinidad Lake State Park Management Plan Update Report (Colorado State Parks 2001) was completed by the State. The following are excerpts from the report.

The Trinidad Lake State Park (State Park) has been managed by the State since 1980 through an agreement with the Corps. The State Park is located in south central Colorado three miles west of

the City of Trinidad, off Highway 12. Situated in Las Animas County, the largest county in the state, the State Park is approximately twelve miles north of the Colorado/New Mexico state line, and two hundred miles nearly due south of Denver. The 2,500 acre State Park, at an average altitude of 6,300 feet, offers a spectacular backdrop of the Sangre de Cristo Mountains, Culebra Range. The State Park is bordered by the Scenic Highway of Legends and the Santa Fe National Historic Trail.

The State Park is the only area on the Purgatoire River that is set aside specifically for large scale, water-based recreation. The fluctuating reservoir averages 800 surface acres and can balloon to over 1400 surface acres in wet years. It is open to all forms of water related recreation. The closest lakes of this size are Lake Pueblo State Park, 100 miles to the north and John Martin State Park, 100 miles to the east. The area is located three miles from a major artery into the state, Interstate 25. The State Park provides water-based recreational opportunities, such as sailing, water skiing, boating, shore fishing, and camping facilities to regional travelers and tourists.

Water is stored in Trinidad Lake for irrigation purposes from October 15 through April 15 every year. Irrigation releases begin after April 15, and the lake is usually drawn down through the six-month irrigation season. Determining factors during this period include local precipitation and the size of the snowpack in the Sangre de Cristo Mountains, Culebra Range.

Another factor affecting lake levels is the susceptibility of the Purgatoire River Valley to flash floods. A flash flood in August of 1981 caused the lake level to rise over 17 vertical feet in a three-day period. A rain/snow event on April 29th, 30th and May 1st of 1999 resulted in a 43 foot vertical rise in the lake level during the month of May. It is difficult to estimate or predict lake levels or even establish an average due to the varying conditions.

The original recreation pool assigned to the project was 4,500 af and offers about 284 surface acres for recreation. When the lake is filled with irrigation water, it can hold over 71,000 af and expands to over 1,400 surface acres. There is 84 vertical feet of fluctuation between the top of the original recreation pool and the top of the irrigation pool. The ideal lake size from a recreational standpoint is between 700 and 1,000 surface acres.

Storage in Trinidad Lake began in 1979 and since then has reached a high elevation of 6,230 feet in 1999, and a low elevation of 6,145.91 feet in September of 1989. Water levels tend to be highest in March and April and lowest in September and October.

The State Park is economically valuable to the City and Las Animas County. In 1994, an Economic Impact and Perception Report completed for the Colorado State Park System indicated that each individual visitor spends at a Colorado State Park is approximately \$75.00 on trip costs that included entrance and camping fees, lodging, groceries, gas, licenses, and other miscellaneous expenses. It is estimated that the State Park generates approximately 15 million dollars in the regional economy. Table 3.3 is the State Park's visitation and revenue figures for the last ten-year period.

Table 3.3 Trinidad Lake State Park Comparison of Visitation, Revenue and Lake Elevations.

Year	Visitors	Revenue	Year Average Elevations	Year Average Surface Acres	Average Elevations May-September	Average Surface Acres May-September
1990	149,724	\$51,018.10	6151.3	327	6151.3	327
1991	144,022	\$54,809.45	6158.7	397	6150.9	323
1992	151,087	\$55,570.50	6160.5	419	6157.6	388
1993	176,172	\$72,099.20	6173.2	575	6179.5	674
1994	199,989	\$81,013.70	6176.5	621	6179.4	674
1995	206,760	\$90,629.60	6180.5	680	6185.9	744
1996	182,388	\$92,306.25	6170.9	529	6162.4	447
1997	166,869	\$109,805.30	6173.2	575	6178.5	662
1998	171,825	\$136,640.05	6179.8	674	6179.8	674
1999	198,429	\$138,792.47	6210.5	1109	6225.9	1359
2000	199,755	\$171,663.67	6212.9	1146	6212.9	1146

No Action Alternative

As described and displayed above, there is a correlation between reservoir volume and the amount of recreation use at Trinidad Reservoir. Typically, higher visitation rates are associated with greater reservoir volume. Under no action, the recreation pool is expected to fluctuate several thousand acre-feet, declining in volume each year until an exchange can be used to replenish the volume lost to evaporation and seepage. Because the opportunity to exchange is expected to be several years apart, the negative impacts to the pool size and potentially to visitation will increase each successive year after an exchange has occurred until the pool is replenished.

The impact of recreation pool volumes are most evident when the irrigation capacity is empty or nearly empty. At these times, the recreation pool represents the major, or possibly the only, volume of water in Trinidad Reservoir. Typically, the irrigation capacity reaches its highest annual level from mid-March to mid-April and then drops over the course of the irrigation season. The irrigation capacity is typically at its lowest level in mid-October and gains volume during the non-irrigation season as water is accumulated in the irrigation capacity. Consequently, the recreation pool has the greatest opportunity to impact visitation in the late summer and fall when the irrigation capacity volume is at its lowest level. The lower the recreation pool volume is during this time of the year, the less value it may provide in attracting visitors to the reservoir.

Each successive year after an exchange, the No Action Alternative will contribute progressively less towards achieving the State's desire for a reservoir surface area of 700 to 1,000 acres, or 21,188 af and 40,716 af of reservoir storage respectively. When the recreation pool is full after an exchange, the State's minimum desired level of 700 surface acres will only be achieved when there is at least 5,221 af in the irrigation capacity. To achieve 700 surface acres after one year's evaporation and seepage losses (1,060 af), a minimum of 6,281 af in the irrigation capacity would be necessary; after five years of losses (5,300 af), 10,521 af of storage in the irrigation capacity would be necessary; and after ten years losses (10,600 af), 15,821 af would be necessary. Each year that the State is unable to conduct an exchange, the opportunity to reach the State's minimum desired reservoir surface area and the duration that the lake may be at or above the minimum desired reservoir surface area lessens.

Amendment Alternative

Under the Amendment Alternative, the recreation pool volume will be relatively more stable than under no action. Fluctuation in the pool volume would probably be limited to several hundred af, assuming that annual reservoir inflows are sufficient to replace all or most of the annual estimated evaporation and seepage losses of 1,060 af. Accrual of water in the recreation pool would be greatest during spring months and lower during all other times of the year. Consequently, the pool will probably be fullest at the beginning of summer and lose volume until the following spring fill begins. The net effect of having a dedicated water supply for the recreation pool is consistently higher reservoir elevations throughout the year.

The City's storage and use of M&I water under the Amendment Alternative will alter reservoir storage patterns in a manner that will benefit recreation. M&I water would be expected to primarily be stored during spring/early runoff seasons and then used throughout the following year to meet City water demands. This change in storage pattern from irrigation use of the water, spring storage and release during the irrigation season, will result in storage of water through a greater part of the year than irrigation water which is stored for a shorter period of time. So, whenever M&I water is stored longer than it would if it had been in the irrigation capacity, the additional volume in the reservoir will contribute to an improved recreation experience.

Under the Amendment Alternative, both factors mentioned above will contribute to reaching the State's desired surface area for the reservoir. The recreation pool volume will be more stable, minimizing the quantity of other water needed to reach the State's minimum desired reservoir surface area of 700 acres. In addition, conversion of irrigation capacity water to M&I water will mean that higher reservoir levels are sustained longer annually. This will help keep the reservoir surface area at or near the State's desired level longer during the year, and especially during historically low reservoir volume periods such as late summer and fall.

SOCIAL AND ECONOMIC ENVIRONMENT

Affected Environment

In the early 1900's the region flourished due to the coal mining industry. Mining camps and "coke towns" were located throughout much of Las Animas County. After World War II, there was a rapid decline of the mining industry, which contributed to a decline in the population and economy of the region. Today, the major economic base is ranching, farming, methane gas extraction, land development and related construction. Economic recovery in the Trinidad area has been slow. Currently, approximately 10,300 people live in the City; the population of Las Animas County is estimated at 17,385 (Colorado State Parks 2001).

No Action Alternative

Projections through 2020 by Black and Veatch (2001) indicate that the City's demand for water will most likely continue to grow based upon population growth. They estimate that the City's population will grow between 2% and 3.5% by 2020. Growth at the 3.5% rate would result in the need to supplement the City's existing water supply before 2020. If growth is low to moderate, the City's current water supplies should be sufficient to meet the City's need through 2020. The City would only be expected to experience socioeconomic impacts due to insufficient water supply if they experience a high rate of population growth. At low and moderate levels of growth, the water supply is expected to be sufficient and no impact on socioeconomic conditions is anticipated.

The City will most likely continue to seek authority to use their MLIC and John Flood water rights given the amount of time and money they have invested to secure them in the past.

Amendment Alternative

Amendment of the Operating Principles to allow M&I use of City owned water stored within Trinidad Reservoir's irrigation capacity is not expected to result in any negative socioeconomic impacts. The City would have sufficient water resources available to address all levels of population growth through 2020, and most likely for a number of years beyond this timeframe. The infrastructure to use water stored in Trinidad Reservoir would need to be developed to make use of the City's water.

CULTURAL RESOURCES

Affected Environment

The National Historic Preservation Act and 36 CFR Part 800 (the federal regulations, which implement the Act) require Reclamation to consider effects to cultural resources within the Area of Potential Effects (APE). The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist". The APE for this undertaking includes Trinidad Reservoir, the Purgatoire River downstream of Trinidad Reservoir and the District.

Much of the land surrounding Trinidad Reservoir has been surveyed for cultural resources and found to contain both prehistoric and historic sites. The Corps has investigated and documented a number of these sites both prior to construction of the reservoir and for post-construction undertakings. In 1994, the Corps, in consultation with the Colorado State Historic Preservation Officer (SHPO), committed to inspect, survey, and mitigate impacts to sites on lands expected to be inundated by enlargement of Trinidad Reservoir's recreation pool (Corps 1994). This commitment includes all lands below the reservoir's maximum high water level.

The presence of cultural resources along the Purgatoire River downstream of Trinidad Reservoir and within the District has not been determined.

No Action Alternative

No operational changes of the irrigation capacity or recreation pool are proposed under the No Action Alternative; there would be no undertaking and no effects to cultural resources under this alternative.

Amendment Alternative

The proposed amendments to the Operating Principles and Operating Criteria would modify storage in Trinidad Reservoir, flow in the Purgatoire River downstream of Trinidad Reservoir and water deliveries within the District. However, the changes in each of these locations are relatively minor and are within the historic operational levels for the reservoir, river and District conveyance system. Furthermore, changes in reservoir levels will not inundate new areas and are limited to lands for which the Corps has already reached agreement on cultural resources protection with the Colorado SHPO. No construction activities are proposed in association with this alternative. Given this information, the proposed action has no potential to cause effects to cultural resources.

CHAPTER FOUR

Consultation and Coordination

SCOPING

Reclamation, in coordination with the Corps, developed a mailing list of entities with potential interest in the proposed action (see Appendix B). A scoping letter describing the proposed action, purpose and need for the action and potential environmental concerns was mailed to each of the entities on the mailing list. The scoping letter also invited comments on the proposed action. Responses to the scoping letter were received from three entities: the states of Kansas and Colorado, and the District.

The following issues related to the proposed action were identified by Reclamation and Corps resource specialists, and in the responses to the scoping letter.

- Effects on the flows of the Purgatoire River and its tributaries downstream of Trinidad Reservoir;
- Changes in Arkansas River flows below its junction with the Purgatoire River;
- Changes in Trinidad Reservoir surface elevation and storage levels;
- Effects on recreation at Trinidad Reservoir;
- Effects of changing water used for irrigation purposes to M&I, especially on agriculture economies, prime farmlands, and City development;
- Effects on local socioeconomics;
- Effects of the proposed stock watering changes on the livestock industry;
- Compliance with the Arkansas River Compact;
- Impacts on Federally-listed threatened and endangered species;
- Impacts on cultural resources.

These are analyzed in Chapter 3.

COOPERATING AGENCY

The U.S. Army Corps of Engineers, South Pacific Division, Albuquerque District participated in this analysis as a cooperating agency, and provided expertise and support related to historic and current operation of Trinidad Dam and Reservoir, resource analysis, agency jurisdiction, mapping, and document reviews.

KEY CONTACTS AND CONSULTATIONS

In additions to those who provided comments, the following were consulted about providing information for the EA. They are:

Jeffrey J. Kahn, Bernard Lyons Gaddis & Kahn, who provided information on the City's water rights and planning.

Jim Fernandez, Utilities Superintendent, City of Trinidad, who provided information on the City's water planning and development.

Thelma Lujan, Administrative Staff, District, who provided information on the District's boundaries and operations.

Paul Flack, Colorado State Parks, who provided information related to the State's acquisition of MLIC water rights and water exchanges for the purpose of filling the recreation pool of Trinidad Reservoir.

Lee Neve, Soil Survey Project Leader, Natural Resources Conservation Service, who provided information on prime farmlands associated with lands to be dried up.

Kevin Salter, State of Kansas, who provided information related to the effects of operational changes and compliance with ARCA.

FWS, who provided information on species within the action area and written concurrence with the findings in Reclamation's *Biological Assessment for Amendment of Operating Principles and/or Operating Criteria at Trinidad Reservoir*.

Bibliography

- Black and Veatch, 2001. "Preliminary Treated Water System Report". Study prepared for the City of Trinidad, Colorado.
- Colorado Division of Wildlife (CDOW), 2003. Natural Diversity Information Source webpage, <http://wildlife.state.co.us>.
- Nebraska Game and Parks Commission, 1996. *Nebraska's Threatened and Endangered Species – Black-footed Ferret*. Nebraska Game and Parks Commission. Lincoln, Nebraska.
- Schroeder, M, 1987. The Black-footed Ferret. Audubon Wildlife Report 1987/1988. Academic Press, Incorporated, Harcourt Brace Javanovitch, Publishers.
- State of Colorado, 2003. State of Colorado's Department of Local Affairs Demographic Section webpage, <http://dola.colorado.gov/demog/Census/DemographicTrend/Places/T.pdf>.
- U.S. Army Corps of Engineers (Corps), 1994. *Final Environmental Assessment for Revision of the Water Control Manual to Allocate Excess Storage in Trinidad Lake, Las Animas County, Colorado*. Albuquerque District, Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service (FWS), 2000. Twelve month administrative finding for the black-tailed prairie dog. Denver, Colorado.
- Wheeler, W.W. and Associates, 2002. "Model Ditch Change of Water Rights." Study prepared for the Model Land and Irrigation Company. Englewood, Colorado.
- Wuerthner, G., 1997. *Viewpoint: the black-tailed prairie dog – headed for extinction?* Journal of Range Management 50:459-466.
- Colorado State Parks, 2001. *Trinidad Lake State Park Management Plan Update*. Trinidad, Colorado.

Personal Communications

- Flack, Paul, 2003. Hydrologist, Division of Parks and Outdoor Recreation, Department of Natural Resources, State of Colorado.
- Gallegos, Jeremy, 2003. Wildlife Manager, Southeast Region, Pueblo, Division of Wildlife, Department of Natural Resources, State of Colorado.
- Kaczmarek, Kevin, 2003. Wildlife Manager, Wildlife Programs-Habitat, Southeast Region, Lamar, Division of Wildlife, Department of Natural Resources, State of Colorado.
- Melby, Jim, 2003. Wildlife Manager, Wildlife Programs-Aquatics, Pueblo Service Center, Pueblo, Division of Wildlife, Department of Natural Resources, State of Colorado.

Biography

The following is a detailed biography of the subject, covering their early life, education, career, and contributions to the field. The subject was born on [Date] in [Location]. They received their undergraduate degree from [University] in [Year], followed by a master's degree from [University] in [Year]. Their professional career began at [Company/Organization] in [Year], where they held various positions of increasing responsibility. Over the course of their career, they have authored several books and articles, and have been recognized for their contributions through various awards and honors. The subject is currently active in the field, continuing to research and contribute to the advancement of their discipline.

APPENDIX A

Modeling of Stock Water Alternatives

**Trinidad Project,
Trinidad, Colorado**

Modeling of Stock Water Alternatives

**Eastern Colorado Area Office
Bureau of Reclamation
July 2004**

Trinidad Project
Modeling of Stock Water Alternatives
Eastern Colorado Area Office
Bureau of Reclamation
July, 2004

I. Introduction

The Trinidad Dam and Reservoir Project (Project) was authorized for construction by the Corps of Engineers (COE) pursuant to Public Law 85-500, 85th Congress (1958). The Project consists principally of a multipurpose dam and reservoir with an irrigation component. Repayment of costs allocated to irrigation were to be in accordance with Reclamation law, hence the irrigation aspects of the development are the responsibility of the Bureau of Reclamation (Reclamation). The irrigation portion of the Project is operated by the Purgatoire River Water Conservancy District (District) in accordance with the Operating Principles. The Operating Principles are signed by the District, the COE, Reclamation, the State of Kansas (Kansas) and the Arkansas River Compact Administration (ARCA).

Diversion of flows during the non-irrigation season for the purpose of stock watering was contemplated in the original planning and analysis of the irrigation portion of the Project by Reclamation. Under the current stock watering practice, inflows are passed through the reservoir at a rate that, when added to the gains below the reservoir, produces not more than 5 cfs for stock watering measured at the Trinidad gage. Diverting stock water at a rate of not more than 5 cfs does not allow water to reach stock ponds on some of the ditches that are included in the District and which historically diverted stock water. The District has been pursuing an amendment to the Operating Principles for the Trinidad Project to change the current stock watering practice.

Concerns have been raised by some of the parties to the Operating Principles about potential effects of alternative stock watering practices as compared to the current practice. Reclamation agreed to analyze, to the degree feasible, potential effects of alternative stock watering practices as compared to the practice currently in the Operating Principles. Reclamation, in cooperation with the COE, will also address the current and alternative practices in an Environmental Assessment. The analysis and results presented below are in response to that commitment by Reclamation.

II. Background

Reclamation's pre-Project analysis acknowledged that the ditches that formed the District diverted an average of 1,500 acre-feet annually during the non-irrigation season. Historic flow records, including those used for the pre-project analysis, indicate that stock water diversions occurred as part of winter irrigation diversions and at rates and times when the divertible flow in the Purgatoire River was sufficient

to reach fields and stock ponds down the lengths of the canals. The pre-project planning modeled the shift of irrigation diversions during the non-irrigation season to storage, the release of stored water at effective rates during the irrigation season, the benefits and effects of the proposed shift of irrigation diversions, and the gains and losses between pre-project operations and operations of the Project as planned. The 1,500 acre-foot stock water allowance was modeled as directly diverted by the ditches during the non-irrigation season at a constant rate of 5 cfs. The planning also assumed the stock water allowance to be non-depletive.

The allowance for stock watering and the modeling was reflected in the original Operating Principles language at IV. D. 2. District Operation, Non-irrigation Season, which has remained unchanged through the current Operating Principles, amended 1997. Sub-paragraphs (a) and (c) read:

'(a) During the non-irrigation season the District will provide an allowance for stock watering purposes of not more than a daily mean flow of five second-feet or its volume equivalent measured at a gage to be located near and above the Baca River headgate. If the stream gains from the Trinidad Dam to said gage are insufficient to fulfill the allowance, an equivalent volume of reservoir inflow will be released to satisfy stock water demands within the allowance.'

'(c) During the non-irrigation season, the District will exercise the direct flow water rights and the District storage right only at such times and to the degree as necessary to assure:

- (1) That the maximum possible storage of reservoir inflow is accrued.
- (2) The stock water allowance is distributed in a manner determined equitable by the District.'

The rate of 5 cfs would result in approximately 1,500 acre-feet over the non-irrigation season (approximately 150 days, November through March) which was the amount originally identified in the pre-project planning studies. The volume amount was later reduced as a result of the Division 2 Water Court ordering in 1986, in Case No. 86CW25, that certain of the Hoehne's rights to stock watering be terminated. Hoehne had historically diverted 200 to 300 acre-feet during the non-irrigation season. Reclamation's 1996 review of Project operations determined that the stock-watering allowance should be reduced to 1,200 acre-feet as a result of the case.

Under the current stock watering practice, stock water diversions are limited to 5 cfs, measured at the Purgatoire River gage above the Baca canal diversion. This rate is inadequate to deliver water to stock ponds on many of the canals given canal sizes, lengths and seepage rates.

The District has proposed that an amendment to the Operating Principles be adopted allowing stock water to be temporarily accumulated in the reservoir and released at

rates adequate to deliver the water down the canals to stock ponds to be able to more effectively and equitably provide stock water to its constituents. The total allowance would continue to be 1,200 acre-feet for the non-irrigation season.

The project began operation in 1979 with irrigation available to all project lands by 1985. During the early years of the project operation the District apparently released water from the reservoir during the non-irrigation season at sufficient rates to allow for stock water deliveries to make it down the canals and reach the stock ponds while not exceeding the overall stock water allowance. Records of deliveries for water years 1988 through 1991 and 1993 were available and indicate that between one and six stock water deliveries were made during the non-irrigation seasons of those years at overall rates up to approximately 80 cfs. The gross deliveries for those years varied between 387 and 980 acre-feet for the whole non-irrigation season, well within the 1,500 acre-feet contemplated in the pre-project planning studies (see Table 1) as well as being within the later 1,200 acre-feet allowance.

In late 1993 the Colorado State Engineer determined that stock watering was not being conducted in accordance with the Operating Principles and directed the District to make future stock water releases at the rates specified in the Operating Principles unless the operating Principles were amended to allow releases at a higher rate.

III. Modeling & Analysis Methodology

A. Modeling Methodology

The purpose of the modeling and analysis was to determine, to the extent feasible, if alternative stock watering practices produced differences in gains or losses to the river system below the District service area. The level of detail and the drawing of absolute conclusions were hampered by the lack of data available and the complexity of modeling a conclusive gain/loss study. Rather than conclusive gain/loss numbers, the following modeling and analysis gives an indication of the magnitude of the gains or losses and the trends.

The overall method for modeling was to take historic data, including historic stock water releases, withhold those releases in the reservoir to produce a river regime below the reservoir without stock water releases and then reintroduce those releases to the system at rates prescribed in the alternatives selected for modeling. The releases were then to be routed into select canals and losses applied to them.

The modeling was intended to produce relative reservoir elevations under the different alternatives, potentially available flows for stock watering, changes to available flows downstream of stock water diversions, and losses in the canals. The canal loss analysis attempted to use preliminary data from the ongoing USGS canal loss study. This data was taken during steady state canal flows in the summer at significantly higher flows than were modeled for stock water

deliveries. Due to the lack of data, evaporative losses in the canals and the timing and effects of return flows were not analyzed. It can be surmised, however, that given the overall volume of stock water diverted does not change between the alternatives, the differences in return flow timing is likely negligible over a complete year between the two alternatives.

B. Alternative Descriptions

Two scenarios were selected for modeling. The two scenarios were selected as representing the range of stock watering practice from the existing 5 cfs limitation to releases from the reservoir at an effective rate to allow stock water to reach stock ponds. Both scenarios limited over all stock water diversions to 1,200 acre-feet. Assumptions for each of the alternatives were made for modeling purposes. The assumptions are for modeling purposes only and should not be construed as limits on future operations or as advocating a position by Reclamation on the District's determination of appropriate rates or timing for future stock watering.

The first scenario models current stock watering practice under the existing language in the Operating Principles limited to maximum stock water diversions rates of 5 cfs and a total maximum diversion of 1,200 acre-feet.

The second scenario models an alternative stock watering practice wherein the District would be allowed to release stored water from the reservoir at rates that they determine would be effective. The District has indicated that diversion rates of approximately 60 cfs are necessary in the larger canals to allow water to run down the canals to reach the stock ponds. In order to stay within the overall limit of 1,200 acre-feet, the stock water diversions were limited to 3 periods during the non-irrigation season and durations of three days for each period.

A comparison of the alternatives and assumptions is given in Table 2.

C. Data Availability

The initial period of record selected for modeling was from water year 1985 through water year 2000, inclusive, based upon data availability from the COE on reservoir inflow, storage, release and evaporation. Data on Purgatoire River flows below the dam (PURBTRCO) and at the Trinidad gage (PURTRICO) were retrieved from the Colorado State Department of Natural Resources web page. Data for the Trinidad gage was not available for the water years of 1987 through 1993. This reduced the period of record for modeling to water years 1985, 1986 and 1994 through 2000 inclusive.

Data on canal losses were obtained from the USGS from their ongoing canal loss study. These data were very limited and preliminary in nature, were for water years 2000, 2001 and 2003, and were for select reaches measured by the USGS. The data were also gathered during the irrigation season, at higher flows than

would be seen during stock watering operations. The measurements taken in some lower canal reaches are influenced by return flows from an upper canal resulting in gains for the lower canal that would not necessarily be seen during the non-irrigation season. The measurements were also taken when the canals had been running at a steady state for a number of days. The data thus could not provide information on how much water or time would be necessary to provide the initial wetting of a canal prism before water could move further down the canal and reach a destination such as a stock pond. Locations of stock ponds were also not available at the time this modeling was conducted.

D. Model Development

A spreadsheet model was developed to model relative flows for the two scenarios. The model was to be developed in 5 separate segments:

1. Reduction of historic data by removal of historic stock watering releases;
2. Reintroduction of stock water under the current Operating Principles language;
3. Reintroduction of stock water under the alternate practice;
4. Routing of stock water under the current Operating Principles language to the canals and demonstration of losses;
5. Routing of stock water under the alternate practice to the canals and demonstration of losses.

The first segment in the model determined what the historic reservoir evaporation loss rates were, then withheld historic deliveries of stock water to the river to determine what the river gains would have been from the reservoir to the Trinidad gage without stock water releases (example in Table 3).

After these were determined, the second segment modeled stock water releases at rates that would have produced 5 cfs available for stock watering diversions at the Trinidad gage. This scenario limited the releases of inflow from the reservoir to the amount necessary to produce the 5 cfs at the Trinidad gage but not to exceed the reservoir inflow. Releases were made as needed to allow stock watering diversions continuously from mid November to mid March. The resultant flow available for stock water diversion was 1,200 acre-feet. It was assumed that the ditches would divert the total 1,200 acre-feet over the non-irrigation season. Flow that might have been available below the Trinidad gage after removing the amount diverted for stock watering was also modeled (example in Table 4). It is assumed that these amounts would have contributed to flows available to downstream users after water for stock watering had been diverted into the ditches.

The third segment modeled the alternative stock water practice by making releases from the reservoir at three periods during the non-irrigation season. Historic records indicate that, prior to 1994, the District made stock water releases

from one to six times during the non-irrigation season. For modeling purposes, three periods were assumed. Records also indicate that the duration of the periods ranged from one to five days. The District has also indicated that it is necessary to divert at rates of at least 60 cfs to get water down some of the larger canals to the stock ponds concurrently with diversions to the smaller canals. For simplification of modeling the releases were made at a constant rate of approximately 65 cfs for the three days in each period in order to make 1,200 acre-feet available for stock water diversions at the Trinidad gage. This represents one end of the range of periods, durations and rates which could be determined by the District to be appropriate for a particular stock watering season. It is fully anticipated that, under actual operations, the appropriate periods, durations and rates that would be the most effective for the District would vary considerably based upon hydrology and the demands at the time. Available flow below the Trinidad gage after removing the amount diverted for stock watering was again modeled for comparison to the current practice (example in Table 5.). Again, it is assumed that these amounts would have contributed to flows available to downstream users after water for stock watering had been diverted into the ditches.

The Trinidad gage was used due to the lack of detailed information about gains in the reaches between the gage and the various headgates and to be consistent with the modeling of the current stock water practice. The District amendment calls for the measurements to be made at the diversion structures.

The fourth and fifth segments of the spreadsheet model would have routed the stock water diversions available under the two alternatives to the ditches, indicated losses in the canals at the available diversion rates and whether there was appreciable flow in successive canal reaches given the losses. Relationships for loss at given flow rates were derived from the measured losses for the individual reaches for which data was available. Due to the preliminary nature of the canal loss information obtained from the USGS Canal Loss Study, and that the USGS data were collected under differing conditions, the results produced in these segments were anticipated to only be able to provide an indication of trends. For example, due to the influence of return flows from upper canals during the irrigation season, certain lower canal reaches showed gains that would not likely exist during low winter stock water deliveries. The mathematical modeling of these reaches did not appear to be representative of actual losses and flows that would exist in a stock watering situation. Due to the lack of sufficient long term data for the period of stock water deliveries, the canal losses modeling was determined to be inconclusive and was not pursued. None of the tables include any modeling of canal losses.

IV. Results

The results are presented in the three aspects modeled as described above;

1. the relative effects on evaporative loss at the reservoir under the two alternatives;
2. the relative amounts of water available downstream of the stock water diversions, and;
3. the relative service to the canals with stock water diversions at the rates modeled in the alternatives.

Table 6 presents a summary of the rates of stock water releases modeled for the alternatives. For both alternatives the overall stock water diverted was kept within the 1,200 acre-foot allowance. Since the current stock watering has been operated as limited to diversions of the 5 cfs or inflow, there is no release from storage in this case. The releases from the reservoir for the alternate stock water practice range from 543 to 749 acre-feet to augment the gains to allow for the 1,200 acre-foot allowance to be diverted. These amounts of reservoir release for stock watering to augment the gains are based upon assumed rates and timing of stock water diversion and the particular years modeled. The District has indicated that when the gains are sufficient, their preference would be to conduct stock watering, without making reservoir releases, potentially at lower rates and over a longer period of time within the non-irrigation season. Also, the District has indicated that they would likely time their stock water diversions to take advantage of natural high flow situations thus reducing the amount of reservoir releases.

Differences in evaporative loss from the reservoir between the alternatives were modeled and are presented in Table 7. The modeled differences range from 2 to 5 acre-feet, or approximately 1% of the total evaporative loss of the reservoir during the non-irrigation seasons modeled, and are considered to be insignificant. Under the alternate stock watering practice there is a small gain in the rate of storage over the current practice when releases are not being made stock watering. However, when a release is made for stock watering at the modeled rate, it results in lowering the content of the reservoir. The slightly increased storage rate results in the content climbing back up faster than under the current practice. The alternate practice content, however, never returns to, or exceeds, the content under the current practice (see example in Figure 1 for water year 1985). The reservoir surface area is then less, resulting in modeled evaporative loss that is less under the alternate practice.

The gains between the reservoir and the Trinidad gage that become available below the stock water diversions are presented in Table 8. Under current practice, so long as the allowance has not been exceeded, whenever water is available at the Trinidad gage the District has the ability to divert those flows, up to 5 cfs, for stock watering purposes. If the gains are less than 5 cfs, they are augmented by bypasses of inflow to make the 5 cfs available. In order to divert 1,200 acre-feet, limited to a maximum rate of 5 cfs, the District must divert for a total of 121 of the approximately 150 days of the non-irrigation season. Thus for only approximately 30 of the non-irrigation season would the gains be fully available below the District service area and during the 121 days of stock water diversion only the portion of the gains that is above 5 cfs would be available below the stock water diversions.

Under the alternate stock water practice, diversions for stock water only occur for a very limited number of days. In the modeling, three periods of three days each, or nine days, were modeled. This would theoretically leave up to 141 days of the 150 day non-irrigation season where the gains from the reservoir to the Trinidad gage could be available downstream of the District service area. (Note that Table 8 indicates less than 141 days of gains available. This is due to the historic gage records used having unexplained days of zero flow.) Other scenarios where the District might choose to divert stock water at effective rates for longer times than modeled, while still staying within the 1,200 acre-feet allowance, would still leave a large percentage of the non-irrigation season where the full amount of the gains would be available downstream of the District service area. While the rates at which this water would be available, as indicated in the model, are small, they would still serve to maintain the wetted perimeter of the downstream channel. Maintaining the wetted perimeter would result in less water being necessary to rewet it when the spring runoff season comes and would again likely result in more water, moving more quickly, down the river during runoff.

The canal loss analysis was inconclusive. Due to the data having been taken at higher flow rates than would be the case for stock watering, being taken in the summer with different antecedent moisture conditions in the canals and the influence of return flows, the mathematical modeling did not appear to give realistic results that could be used to compare the alternatives. The differences between alternatives would presumably be in evaporative loss and in return flow timing. It is unlikely that either of these would be significantly or perhaps even measurably different between the alternatives given the small volumes of water and flow rates involved. Given the geometry of certain canals (bottom widths of the Picketwire and Enlarged South Side are approximately 10 feet and 21 feet respectively) it can be concluded that 5 cfs flows in these canals are not effective in trying to deliver stock water down these canals to the stock ponds. This is supported by the fact that the larger canals have historically not taken stock water when limited to the 5 cfs rate.

V. Conclusions

It appears from the results of the modeling effort that the effects of changing the stock watering practice from the current one to an alternate practice that allows the District to release stored water at more effective rates is minimal if not negligible. If anything, the modeling results indicate that, under the alternate practice, there would be a reduction in evaporative loss at the reservoir and an increase in the amount of the gains originating between the reservoir and the Trinidad gage that would be available to the river downstream of the stock water diversions. While the canal loss analysis was inconclusive, examination of the canal geometry and recent practice supports the observation that the current 5 cfs limitation on diversions does not result in water reaching segments of many of the canals. The 5 cfs limitation does not appear to allow the most effective and equitable use of the stock watering allowance.

Table 1
Trinidad Project
Summary of Historic Stock Watering for Select Water Years
(Non-Irrigation Season)

Item / Water Year	Baca ²	El Moro ²	Ditches Enlarged S. Side	John Flood ³	Picketwire ²		
						Max. Overall Rate of SW Diversions (cfs)¹	Total Stock Water Diversions (acft)
Daily Max. Stock Water Diversion Rates for Each Ditch (cfs)							
1988	4.00	1.00	58.31	17.85	22.46	74.87	980
1989	4.01	1.33	39.17	10.42	29.95	76.17	791
1990	4.08	2.00	52.34	0.00	25.00	77.24	713
1991	11.70	2.00	75.97	28.20	63.32	75.97	980
1993	4.00	0.00	40.00	15.00	20.00	79.00	387
						Total Days of SW Diversions¹	
No. of Days Stock Water Diverted for Each Ditch							
1988	7	7	7	10	7		17
1989	4	3	6	9	9		18
1990	5	4	6	0	6		9
1991	5	3	4	3	4		16
1993	3	0	3	3	3		3
						Total No of Release Periods¹	
No. of Stock Water Release Periods to Ditches During Non-Irrigation Season							
1988	2	2	2	3	2		5
1989	1	1	2	3	3		6
1990	2	2	2	0	2		2
1991	1	1	1	1	1		4
1993	1	0	1	1	1		1

(Source: Colorado State, Div. of Water Res., Div. 2 Records)

¹ Not all ditches diverted at the same time or during the same periods.

² Baca and El Moro ditches are diverted through the Picketwire ditch. Picketwire rates do not include Baca or El Moro.

³ John Flood is diverted through the Model Ditch.

**Table 2.
Trinidad Project
Comparison of Assumptions for Stock Watering Alternatives Modeled**

Item	Alternative Description	
	Current Operating Principles	Alternate Stock Watering
Period of Stock Water Diversions*	November 15 - March 15	3 Periods of 3 Days Each Between November 15 - March 15
Rate of Reservoir Release	Rate necessary, with river gains, to produce 5 cfs at Trinidad gage.	Rate necessary, with river gains, not to exceed total volume at Trinidad gage.
Rate of Stock Water Diversion	Maximum of 5 cfs	Rate necessary not to exceed total volume at Trinidad gage.
Total Volume of Stock Water Divertible	1,200 acre-feet	1,200 acre-feet
Flow Available Downstream of Stock Water Diversions	Gains when no stock water being diverted or flow above 5 cfs	Gains when no stock water being diverted

* Consistent with historic practice, the period of stockwatering within the Non-irrigation Season was limited to 120 days between Nov. 15 & Mar 15 for the purposes of modeling. The Non-irrigation Season is defined in the Operating Principles as that period of the year other than the Irrigation Season. The Irrigation Season is limited in the Operating Principles to not beginning prior to April 1 nor ending later than October 15, except as modified by the District with the consent of the Secretary of Interior.

Table 3
Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
Water Year 1985
Historic Operation

Historic Reservoir Operation													Historic Gage Flows		Flows w/o Historic SW Releases /2	
Date	Historic Gross Content	Inflow	Release	Evap.	Change in Content	Surface Acres at Content	Daily Evap. Rate	Inflow Stored	Stock Water Released From Storage	Cummulative Stock Water From Storage	Cummulative Total Inflow Stored	Historic Below Trinidad Dam (PURTRCO)	Historic at Trinidad (PURTRICO)	Gage Below Trinidad Dam	Gage At Trinidad	
(Source/Note ->) /1	(acre-feet) (COE)	(cfs) (COE)	(cfs) (COE)	(acre-feet) (COE)	(acre-feet) (COE)	(acres)	(acft/acre)	(cfs)	(cfs) /#	(acre-feet) /#	(acre-feet) /#	(cfs) (SEO)	(cfs) (SEO)	(cfs)	(cfs)	
Total Days of Diversion/availability																
Totals (acre-feet)					575.23						280	7,687				
Max Rates (cfs)																
Mean Rate when Diverting (cfs)																
10/31/84	25,201															
11/01/84	25,265	38	0	5.95	64	762	0.0078	38	0	0	71	0.1	3.2	0.1	3.2	
11/02/84	25,345	47	0	13.88	80	763	0.0182	47	0	0	184	0.1	3	0.1	3.0	
11/03/84	25,398	32	0	13.88	51	763	0.0182	32	0	0	227	0.1	3	0.1	3.0	
11/04/84	25,476	42	0	3.97	79	765	0.0052	42	0	0	310	0.1	2.5	0.1	2.5	
11/05/84	25,548	40	0	5.95	73	766	0.0078	40	0	0	389	0.1	2.8	0.1	2.8	
11/06/84	25,629	48	0	9.92	81	767	0.0129	48	0	0	480	0.1	2.8	0.1	2.8	
11/07/84	25,687	35	0	11.9	58	768	0.0155	35	0	0	549	0.1	2.8	0.1	2.8	
11/08/84	25,753	39	0	11.9	68	769	0.0155	39	0	0	626	0.1	2.8	0.1	2.8	
11/09/84	25,789	22	0	5.95	36	769	0.0077	22	0	0	670	0.1	2.8	0.1	2.8	
11/10/84	25,840	30	0	7.93	51	770	0.0103	30	0	0	730	0.1	2.8	0.1	2.8	
11/11/84	25,922	44	0	5.95	82	772	0.0077	44	0	0	817	0.1	3.2	0.1	3.2	
11/12/84	25,987	37	0	7.93	65	773	0.0103	37	0	0	890	0.1	3.2	0.1	3.2	
11/13/84	26,061	43	0	11.9	74	774	0.0154	43	0	0	875	0.1	2.8	0.1	2.8	
11/14/84	26,098	23	0	7.93	37	774	0.0102	23	0	0	1,021	0.0	2.8	0.0	2.8	
11/15/84	26,158	32	0	3.97	60	775	0.0051	32	0	0	1,084	0.0	3.2	0.0	3.2	
11/16/84	26,224	36	0	3.97	66	777	0.0051	36	0	0	1,155	0.0	3.2	0.0	3.2	
11/17/84	26,269	25	0	3.97	45	778	0.0051	25	0	0	1,205	0.0	3.5	0.0	3.5	
11/18/84	26,328	33	0	6.95	59	778	0.0078	33	0	0	1,270	0.0	3.5	0.0	3.5	
11/19/84	26,358	23	5	5.95	30	779	0.0078	18	0	0	1,308	4.3	3.6	0.0	0.0	
11/20/84	26,395	28	7	5.95	37	779	0.0078	21	0	0	1,348	6.4	3.2	0.0	0.0	
11/21/84	26,447	33	4	5.95	52	780	0.0078	29	0	0	1,406	2.9	2.7	0.0	0.0	
11/22/84	26,500	29	0	5.95	63	781	0.0078	29	0	0	1,454	0.1	2.1	0.1	2.1	
11/23/84	26,575	40	0	5.95	75	781	0.0078	40	0	0	1,543	0.1	2.3	0.1	2.3	
11/24/84	26,627	29	0	5.95	52	782	0.0078	29	0	0	1,601	0.1	2.6	0.1	2.5	
11/25/84	26,680	29	0	5.95	53	783	0.0078	29	0	0	1,659	0.0	2.3	0.0	2.3	
11/26/84	26,732	29	0	5.95	52	783	0.0078	29	0	0	1,717	0.0	2.3	0.0	2.3	
11/27/84	26,755	14	0	5.95	23	784	0.0078	14	0	0	1,745	0.0	2.5	0.0	2.5	
11/28/84	26,800	25	0	5.95	45	785	0.0078	25	0	0	1,795	0.1	2.3	0.1	2.3	
11/29/84	26,837	21	0	5.95	37	786	0.0078	21	0	0	1,837	0.0	2.1	0.0	2.1	
11/30/84	26,883	25	0	5.95	48	788	0.0078	25	0	0	1,887	0.1	1.9	0.1	1.9	
12/01/84	26,938	28	0	3.97	53	787	0.0050	28	0	0	1,943	0.1	2.1	0.1	2.1	
12/02/84	26,981	24	0	3.97	45	788	0.0050	24	0	0	1,991	0.1	2.3	0.1	2.3	
12/03/84	27,034	28	0	3.97	53	788	0.0050	28	0	0	2,047	0.0	2.1	0.0	2.1	
12/04/84	27,041	24	19	3.97	7	788	0.0050	5	0	0	2,057	19.0	18	0.0	0.0	
12/05/84	28,996	8	29	3.97	-45	788	0.0050	0	21	42	2,057	30.0	47	1.0	18.0	
12/06/84	26,981	23	29	3.97	-15	788	0.0050	0	8	54	2,057	30.0	56	1.0	27.0	
12/07/84	28,981	30	28	3.97	0	788	0.0050	2	0	54	2,061	28.0	33	0.0	5.0	
12/08/84	27,056	59	19	3.97	75	789	0.0050	40	0	54	2,140	19.0	24	0.0	6.0	
12/09/84	27,125	36	0	3.97	89	790	0.0050	36	0	54	2,211	0.1	3.8	0.1	3.8	
12/10/84	27,178	28	0	3.97	53	791	0.0050	28	0	54	2,267	0.1	3	0.1	3.0	
12/11/84	27,201	30	17	3.97	23	791	0.0050	13	0	54	2,293	19.0	14	2.0	0.0	
12/12/84	27,224	42	29	3.97	23	792	0.0050	13	0	54	2,319	32.0	26	3.0	0.0	
12/13/84	27,277	39	10	3.97	53	793	0.0050	29	0	54	2,377	8.7	13	0.0	3.0	

Table 3
Trinidad Reservoir - Stock Water Modelling During Non-Irrigation Season
Water Year 1985
Historic Operation

Date (Source/Note ->)/1	Historic Reservoir Operation								Historic Gage Flows				Flows w/o Historic SW Releases /2		
	Historic Gross Content (acre-feet) (COE)	Inflow (cfs) (COE)	Release (cfs) (COE)	Evap. (acre-feet) (COE)	Change In Content (acre-feet)	Surface Acres at Content (acres)	Daily Evap. Rate (act/acre)	Inflow Stored (cfs)	Stock Water Released From Storage (cfs) /B	Cumulative Stock Water From Storage (acre-feet)	Cumulative Total Inflow Stored (acre-feet) /B	Hist. Below Trinidad Dam (PURTRCO) (cfs) (SEO)	Hist. at Trinidad (PURTRICO) (cfs) (SEO)	Gage Below Trinidad Dam (cfs)	Gage At Trinidad (cfs)
Total Days of Diversion/availability Totals (acre-feet)				675.23						280	7,687				
Max Rates (cfs)															
Mean Rate when Diverting (cfs)															
12/14/84	27,331	29	0	3.97	54	794	0.0050	29	0	54	2,435	0.1	2.3	0.1	2.3
12/15/84	27,392	32	0	3.97	61	795	0.0050	32	0	54	2,498	0.1	2.5	0.1	2.5
12/16/84	27,438	26	0	3.97	48	798	0.0050	25	0	54	2,548	0.1	2.5	0.1	2.5
12/17/84	27,453	9	0	3.97	15	796	0.0050	9	0	54	2,566	0.1	2.3	0.1	2.3
12/18/84	27,507	29	0	3.97	54	798	0.0050	29	0	54	2,624	0.1	2.6	0.1	2.6
12/19/84	27,568	32	0	3.97	61	799	0.0050	32	0	54	2,687	0.1	2.5	0.1	2.5
12/20/84	27,637	37	0	3.97	69	800	0.0050	37	0	54	2,760	0.1	2.5	0.1	2.5
12/21/84	27,668	17	0	3.97	31	801	0.0050	17	0	54	2,794	0.1	2.3	0.1	2.3
12/22/84	27,691	13	0	3.97	23	801	0.0050	13	0	54	2,820	0.1	1.9	0.1	1.9
12/23/84	27,753	33	0	3.97	62	803	0.0049	33	0	54	2,885	0.1	2.3	0.1	2.3
12/24/84	27,792	21	0	3.97	39	804	0.0049	21	0	54	2,927	0.1	1.9	0.1	1.9
12/25/84	27,854	33	0	3.97	62	805	0.0049	33	0	54	2,992	0.1	2.5	0.1	2.5
12/26/84	27,931	40	0	3.97	77	807	0.0048	40	0	54	3,071	0.1	3	0.1	3.0
12/27/84	28,016	45	0	3.97	85	808	0.0049	45	0	54	3,160	0.1	2.5	0.1	2.5
12/28/84	28,102	45	0	3.97	86	810	0.0049	45	0	54	3,249	0.1	2.5	0.1	2.5
12/29/84	28,184	33	0	3.97	62	811	0.0049	33	0	54	3,314	0.0	2.5	0.0	2.5
12/30/84	28,211	25	0	3.97	47	812	0.0049	25	0	54	3,364	0.0	2.3	0.0	2.3
12/31/84	28,274	33	0	3.97	63	814	0.0049	33	0	54	3,429	0.0	2.8	0.0	2.8
01/01/85	28,313	21	0	1.98	39	814	0.0024	21	0	54	3,471	0.0	1.9	0.0	1.9
01/02/85	28,328	8	0	0	15	814	0.0000	8	0	54	3,487	0.0	2.5	0.0	2.5
01/03/85	28,344	8	0	0	16	815	0.0000	8	0	54	3,503	0.0	3	0.0	3.0
01/04/85	28,391	24	0	0	47	818	0.0000	24	0	54	3,551	0.0	3	0.0	3.0
01/05/85	28,454	32	0	0	63	817	0.0000	32	0	54	3,614	0.0	2.5	0.0	2.5
01/06/85	28,509	28	0	0	55	818	0.0000	28	0	54	3,670	0.0	2.3	0.0	2.3
01/07/85	28,572	32	0	0	63	819	0.0000	32	0	54	3,733	0.0	2.5	0.0	2.5
01/08/85	28,651	40	0	0	79	820	0.0000	40	0	54	3,812	0.0	2.5	0.0	2.5
01/09/85	28,708	28	0	0	55	821	0.0000	28	0	54	3,888	0.0	1.9	0.0	1.9
01/10/85	28,738	16	0	0	32	822	0.0000	16	0	54	3,900	0.0	2.3	0.0	2.3
01/11/85	28,777	20	0	0	39	823	0.0000	20	0	54	3,940	0.0	2.3	0.0	2.3
01/12/85	28,801	12	0	0	24	823	0.0000	12	0	54	3,964	0.0	2.8	0.0	2.8
01/13/85	28,858	28	0	0	66	824	0.0000	28	0	54	4,020	0.0	2.8	0.0	2.8
01/14/85	28,904	24	0	0	48	825	0.0000	24	0	54	4,068	0.0	2.5	0.0	2.5
01/15/85	28,952	24	0	0	48	825	0.0000	24	0	54	4,118	0.0	3	0.0	3.0
01/16/85	29,007	28	0	0	55	827	0.0000	28	0	54	4,172	0.0	3	0.0	3.0
01/17/85	29,065	24	0	0	48	827	0.0000	24	0	54	4,220	0.0	2.8	0.0	2.8
01/18/85	29,119	32	0	0	64	828	0.0000	32	0	54	4,283	0.0	3	0.0	3.0
01/19/85	29,176	28	0	0	56	830	0.0000	28	0	54	4,339	0.0	2.8	0.0	2.8
01/20/85	29,215	20	0	0	40	830	0.0000	20	0	54	4,379	0.0	2.3	0.0	2.3
01/21/85	29,247	18	0	0	32	831	0.0000	18	0	54	4,411	0.0	2.1	0.0	2.1
01/22/85	29,287	20	0	0	40	831	0.0000	20	0	54	4,451	0.0	2.5	0.0	2.5
01/23/85	29,338	26	0	0	49	832	0.0000	26	0	54	4,501	0.0	2.3	0.0	2.3
01/24/85	29,384	24	0	0	48	833	0.0000	24	0	54	4,549	0.0	2.3	0.0	2.3
01/25/85	29,448	32	0	0	64	834	0.0000	32	0	54	4,612	0.0	2.5	0.0	2.5
01/26/85	29,498	24	0	0	48	835	0.0000	24	0	54	4,660	0.0	2.1	0.0	2.1

Table 3
Trinidad Reservoir - Stock Water Modeling During Non-Irrigation Season
Water Year 1985
Historic Operation

Date (Source/Note ->) /1	Historic Reservoir Operation					Change in Content (acre-feet)	Surface Area at Content (acres)	Daily Evap. Rate (ac/acre)	Inflow Stored (cfs)	Stock Water Released From Storage (cfs) /8	Cummulative Stock Water From Storage (acre-feet)	Cummulative Total Inflow Stored (acre-feet) /8	Historic Gage Flows		Flows w/o Historic SW Releases /2		
	Historic Gross Content (acre-feet) (COE)	Inflow (cfs) (COE)	Release (cfs) (COE)	Evap. (acre-feet) (COE)	Hist. Below Trinidad Dam (PURTRCO) (cfs) (SEO)								Hist. at Trinidad (PURTRICO) (cfs) (SEO)	Gage Below Trinidad Dam (cfs)	Gage At Trinidad (cfs)		
Total Days of Diversion/availability																	
Totals (acre-feet)						575.23					280	7,887					
Max Rates (cfs)																	
Mean Rate when Diverting (cfs)																	
01/27/85	29,552	28	0	0	56	836	0.0000	28	0	54	4,716	0.0	2.3	0.0	2.3		
01/28/85	29,601	25	0	0	49	837	0.0000	25	0	54	4,766	0.0	1.9	0.0	1.9		
01/29/85	29,633	16	0	0	32	837	0.0000	16	0	54	4,798	0.0	1.9	0.0	1.9		
01/30/85	29,650	8	0	0	17	837	0.0000	8	0	54	4,814	0.0	1.5	0.0	1.5		
01/31/85	29,668	8	0	0	18	838	0.0000	8	0	54	4,830	0.0	2.3	0.0	2.3		
02/01/85	29,674	4	0	0	8	838	0.0000	4	0	54	4,838	0.0	4	0.0	4.0		
02/02/85	29,690	8	0	0	18	838	0.0000	8	0	54	4,854	0.0	3.8	0.0	3.8		
02/03/85	29,747	29	0	0	57	839	0.0000	29	0	54	4,912	0.0	4	0.0	4.0		
02/04/85	29,787	20	0	0	40	839	0.0000	20	0	54	4,952	0.0	2.8	0.0	2.8		
02/05/85	29,820	16	0	0	33	840	0.0000	16	0	54	4,984	0.0	3	0.0	3.0		
02/06/85	29,852	16	0	0	32	840	0.0000	16	0	54	5,016	0.0	2.5	0.0	2.5		
02/07/85	29,884	18	0	0	32	840	0.0000	16	0	54	5,048	0.0	2.3	0.0	2.3		
02/08/85	29,933	26	0	0	49	841	0.0000	26	0	54	5,098	0.0	2.3	0.0	2.3		
02/09/85	29,968	21	4	0	33	841	0.0000	17	0	54	5,132	3.7	2.3	0.0	0.0		
02/10/85	30,015	29	4	0	49	842	0.0000	25	0	54	5,182	2.7	2.3	0.0	0.0		
02/11/85	30,056	20	0	0	41	842	0.0000	20	0	54	5,222	0.0	2.3	0.0	2.3		
02/12/85	30,104	26	0	0	48	843	0.0000	25	0	54	5,272	0.0	2.6	0.0	2.6		
02/13/85	30,178	37	0	0	74	844	0.0000	37	0	54	5,345	0.0	2.6	0.0	2.6		
02/14/85	30,244	33	0	0	68	845	0.0000	33	0	54	5,410	0.0	1.9	0.0	1.9		
02/15/85	30,317	37	0	0	73	845	0.0000	37	0	54	5,483	0.0	1.7	0.0	1.7		
02/16/85	30,381	37	0	0	74	846	0.0000	37	0	54	5,556	0.0	1.7	0.0	1.7		
02/17/85	30,449	29	0	0	58	847	0.0000	29	0	54	5,614	0.0	1.3	0.0	1.3		
02/18/85	30,506	29	0	0	57	848	0.0000	29	0	54	5,672	0.0	1.5	0.0	1.5		
02/19/85	30,563	29	0	0	57	848	0.0000	29	0	54	5,730	0.0	1.3	0.0	1.3		
02/20/85	30,613	25	0	0	50	849	0.0000	25	0	54	5,780	0.0	1.3	0.0	1.3		
02/21/85	30,671	29	0	0	58	850	0.0000	29	0	54	5,838	0.0	1.5	0.0	1.5		
02/22/85	30,720	25	0	0	49	850	0.0000	25	0	54	5,888	0.0	1.5	0.0	1.5		
02/23/85	30,794	37	0	0	74	851	0.0000	37	0	54	5,961	0.0	1.9	0.0	1.9		
02/24/85	30,844	25	0	0	50	851	0.0000	25	0	54	6,011	0.0	2.1	0.0	2.1		
02/25/85	30,911	33	0	0	67	851	0.0000	33	0	54	6,078	0.0	1.9	0.0	1.9		
02/26/85	30,919	20	18	0	8	852	0.0000	4	0	54	6,084	18.0	13	0.0	0.0		
02/27/85	30,819	24	24	0	0	852	0.0000	0	0	54	6,084	25.0	23	1.0	0.0		
02/28/85	30,862	25	25	0	33	852	0.0000	0	0	54	6,084	9.2	13	0.0	0.0		
03/01/85	31,002	25	0	0	50	852	0.0000	25	0	54	6,134	0.1	3	0.1	3.0		
03/02/85	31,043	21	0	0	41	853	0.0000	21	0	54	6,176	0.1	3.5	0.1	3.6		
03/03/85	31,077	17	0	0	34	853	0.0000	17	0	54	6,210	0.0	3.2	0.0	3.2		
03/04/85	31,119	22	0	1.98	42	854	0.0023	22	0	54	6,254	0.1	2.8	0.1	2.8		
03/05/85	31,152	18	0	1.98	33	854	0.0023	18	0	54	6,290	0.1	2.6	0.1	2.6		
03/06/85	31,202	26	0	1.98	50	855	0.0023	26	0	54	6,342	0.0	2.8	0.0	2.8		
03/07/85	31,219	10	0	3.97	17	856	0.0048	10	0	54	6,382	0.0	2.8	0.0	2.8		
03/08/85	31,252	20	0	5.95	33	855	0.0070	20	0	54	6,402	0.0	2.6	0.0	2.6		
03/09/85	31,302	29	0	5.95	50	856	0.0070	29	0	54	6,460	0.0	2.8	0.0	2.8		
03/10/85	31,344	25	0	7.93	42	856	0.0093	25	0	54	6,510	0.0	3.2	0.0	3.2		
03/11/85	31,412	38	0	7.93	68	857	0.0093	38	0	54	6,565	0.0	5.7	0.0	5.7		

Table 3
Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
Water Year 1985
Historic Operation

Date (Source/Note ->)/1	Historic Reservoir Operation								Historic Gage Flows		Flows w/o Historic SW Releases /2				
	Historic Gross Content (acre-feet) (COE)	Inflow (cfs) (COE)	Release (cfs) (COE)	Evap. (acre-feet) (COE)	Change in Content (acre-feet)	Surface Acres at Content (acres)	Daily Evap. Rate (act/acre)	Inflow Stored (cfs)	Stock Water Released From Storage (cfs) /8	Cumulative Stock Water From Storage (acre-feet) /8	Cumulative Total Inflow Stored (acre-feet) /8	Hist. Below Trinidad Dam (PURBTRCO) (cfs) (SEO)	Hist. at Trinidad (PURTRICO) (cfs) (SEO)	Gage Below Trinidad Dam (cfs)	Gage At Trinidad (cfs)
	Total Days of Diversion/availability Totals (acre-feet)			575.23					280	7,687					
	Max Rates (cfs)														
	Mean Rate when Diverting (cfs)														
03/12/85	31,487	42	0	7.93	75	858	0.0092	42	0	54	6,668	0.1	6	0.1	6.0
03/13/85	31,538	29	0	7.93	51	859	0.0092	29	0	54	6,726	0.2	4.8	0.2	4.8
03/14/85	31,596	33	0	7.93	58	859	0.0092	33	0	54	6,781	0.2	4.2	0.2	4.2
03/15/85	31,655	33	0	7.93	59	860	0.0092	33	0	54	6,856	0.2	4	0.2	4.0
03/16/85	31,731	42	0	7.93	76	861	0.0092	42	0	54	6,939	0.2	4.2	0.2	4.2
03/17/85	31,781	29	0	7.93	50	862	0.0092	29	0	54	6,997	0.2	3.8	0.2	3.8
03/18/85	31,841	34	0	7.93	60	863	0.0092	34	0	54	7,064	0.2	4	0.2	4.0
03/19/85	31,883	25	0	7.93	42	864	0.0092	25	0	54	7,114	0.2	4.2	0.2	4.2
03/20/85	31,987	46	0	7.93	84	865	0.0092	46	0	54	7,205	0.2	4	0.2	4.0
03/21/85	32,018	30	0	7.93	51	865	0.0092	30	0	54	7,265	0.2	3.8	0.2	3.5
03/22/85	32,061	25	0	7.93	43	866	0.0092	25	0	54	7,315	0.2	3.8	0.2	3.8
03/23/85	32,103	25	0	7.93	42	866	0.0092	25	0	54	7,365	0.2	3.5	0.2	3.5
03/24/85	32,163	35	0	8.82	60	867	0.0114	35	0	54	7,434	0.2	3.2	0.2	3.2
03/25/85	32,214	34	0	15.87	51	868	0.0183	34	0	54	7,501	0.2	3.2	0.2	3.2
03/26/85	32,239	25	0	23.8	25	868	0.0274	25	0	54	7,551	0.2	4	0.2	4.0
03/27/85	32,290	38	0	23.8	51	868	0.0274	38	0	54	7,626	0.2	4	0.2	4.0
03/28/85	32,341	31	0	8.92	51	869	0.0114	31	0	54	7,687	0.2	4	0.2	4.0
03/29/85	32,290	30	54	3.97	-51	-868	0.0046	0	34	101	7,687	54.0	43	0.0	0.0
03/30/85	32,205	37	74	9.32	-85	867	0.0114	0	37	175	7,687	74.0	65	0.0	0.0
03/31/85	32,095	21	74	5.95	-110	868	0.0069	0	53	280	7,687	74.0	65	0.0	0.0

See list of footnotes after Table 5.

Table 4
Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
Water Year 1983
Reservoir Operations and River Gage Flows with Stock Water Releases of Inflow to Make 5 cfs Available

Date (Source/Note ->)/1	Reservoir Content (acre-feet)	Surface Area at Content (acres)	Inflow (cfs) (COE)	Release (cfs) /4, /5, /8	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water Released (cfs) /5, /8	Cumulative Stock Water (acre-feet)	Cumulative Total Inflow Stored (acre-feet) /8	Gage Flows		Flow Avail For Stockwater at Trinidad gage (cfs)	Cumulative Flow Avail For Stock water at Trinidad gage (acre-feet)	Flow Avail. Below Stock water Diversion (cfs) /7	Cumulative Flow Avail. Below Stockwater Diversion (acre-feet) /7	
											Blw Trinidad Dam w/ 5 cfs SW (PURBTRCO) (cfs)	at Trinidad w/ 5 cfs SW (PURTRICO) (cfs)					
Total Days of Diversion/availability Totals (acre-feet)						574.57				0	7,708			120			
Max Rates (cfs)														5	1,100	22	281
Mean Rate when Diverging (cfs)														5		4	
10/31/84	25,201									0							
11/01/84	25,268	781	38.00	0.00	5.94	65	36	0	0	71	0.1	3.2	0	0		3.2	6.3
11/02/84	25,346	782	47.00	0.00	13.88	79	47	0	0	184	0.1	3	0	0		3.0	12.3
11/03/84	25,395	783	32.00	0.00	13.87	50	32	0	0	227	0.1	3	0	0		3.0	18.2
11/04/84	25,475	783	42.00	0.00	3.96	79	42	0	0	310	0.1	2.5	0	0		2.5	23.2
11/05/84	25,548	785	40.00	0.00	5.94	73	40	0	0	389	0.1	2.8	0	0		2.8	28.8
11/06/84	25,630	788	46.00	0.00	9.91	81	48	0	0	490	0.1	2.8	0	0		2.8	34.3
11/07/84	25,687	787	35.00	0.00	11.89	58	35	0	0	549	0.1	2.8	0	0		2.8	39.9
11/08/84	25,753	788	39.00	0.00	11.89	65	39	0	0	626	0.1	2.8	0	0		2.8	45.4
11/09/84	25,790	789	22.00	0.00	6.95	38	22	0	0	670	0.1	2.8	0	0		2.8	51.0
11/10/84	25,842	789	30.00	0.00	7.92	52	30	0	0	730	0.1	2.8	0	0		2.8	66.6
11/11/84	25,923	770	44.00	0.00	5.93	81	44	0	0	817	0.1	3.2	0	0		3.2	62.9
11/12/84	25,989	772	37.00	0.00	7.92	85	37	0	0	890	0.1	3.2	0	0		3.2	69.2
11/13/84	26,082	773	43.00	0.00	11.89	73	43	0	0	975	0.1	2.8	0	0		2.8	74.8
11/14/84	26,100	774	23.00	0.00	7.93	38	23	0	0	1,021	0	2.8	0	0		2.8	80.3
11/15/84	26,156	774	32.00	1.80	3.97	68	30	0	0	1,081	1.8	5	5	10		0.0	80.3
11/16/84	26,220	775	38.00	1.80	3.96	64	34	0	0	1,149	1.8	5	5	20		0.0	80.3
11/17/84	26,262	777	25.00	1.50	3.97	43	24	0	0	1,196	1.5	5	5	30		0.0	80.3
11/18/84	26,319	777	33.00	1.50	5.94	57	32	0	0	1,258	1.5	5	5	40		0.0	80.3
11/19/84	26,348	778	23.00	5.00	5.95	30	18	0	0	1,294	5	5	5	50		0.0	80.3
11/20/84	26,388	779	28.00	5.00	5.95	40	23	0	0	1,340	5	5	5	60		0.0	80.3
11/21/84	26,438	779	33.00	5.00	5.94	50	28	0	0	1,398	5	5	5	69		0.0	80.3
11/22/84	26,484	780	29.00	2.90	6.94	46	28	0	0	1,448	3	5	5	79		0.0	80.3
11/23/84	26,552	780	40.00	2.70	5.94	68	37	0	0	1,522	2.8	5	5	89		0.0	80.3
11/24/84	26,598	781	29.00	2.50	5.94	47	27	0	0	1,575	2.8	5	5	99		0.0	80.3
11/25/84	26,844	782	29.00	2.70	5.94	48	26	0	0	1,627	2.7	5	5	109		0.0	80.3
11/26/84	26,691	782	29.00	2.70	5.94	46	26	0	0	1,679	2.7	5	5	119		0.0	80.3
11/27/84	26,708	783	14.00	2.50	6.94	17	12	0	0	1,702	2.5	5	5	129		0.0	80.3
11/28/84	26,746	783	25.00	2.70	5.94	38	22	0	0	1,748	2.8	5	5	139		0.0	80.3
11/29/84	26,776	784	21.00	2.90	5.93	30	18	0	0	1,782	2.9	5	5	149		0.0	80.3
11/30/84	26,813	784	25.00	3.10	5.93	38	22	0	0	1,825	3.2	5	5	159		0.0	80.3
12/01/84	26,859	785	28.00	2.90	3.98	46	25	0	0	1,875	3	5	5	169		0.0	80.3
12/02/84	26,897	786	24.00	2.70	3.98	38	21	0	0	1,917	2.8	5	5	179		0.0	80.3
12/03/84	26,943	787	28.00	2.90	3.96	46	25	0	0	1,967	2.9	5	5	188		0.0	80.3
12/04/84	26,977	787	24.00	5.00	3.96	34	19	0	0	2,005	5	5	5	198		0.0	80.3
12/05/84	26,989	788	8.00	0.00	3.97	12	8	0	0	2,021	1	18	5	208	13.0		106.1
12/06/84	27,030	788	23.00	0.00	3.97	42	23	0	0	2,087	1	27	5	218	22.0		149.8
12/07/84	27,086	788	30.00	0.00	3.97	58	30	0	0	2,127	0	5	5	228	0.0		149.8
12/08/84	27,199	789	58.00	0.00	3.97	113	59	0	0	2,244	0	5	5	238	0.0		149.8
12/09/84	27,284	791	36.00	1.20	3.98	65	35	0	0	2,313	1.3	5	5	248	0.0		149.8
12/10/84	27,312	792	28.00	2.00	3.98	48	26	0	0	2,365	2.1	5	5	258	0.0		149.8
12/11/84	27,357	794	30.00	5.00	3.98	48	25	0	0	2,415	7	5	5	268	0.0		149.8
12/12/84	27,427	794	42.00	5.00	3.98	69	37	0	0	2,488	8	5	5	278	0.0		149.8
12/13/84	27,496	796	39.00	2.00	3.98	89	37	0	0	2,581	2	5	5	288	0.0		149.8

Table 4
 Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
 Water Year 1985
 Reservoir Operations and River Gage Flows with Stock Water Releases of Inflow to Make 5 cfs Available

Date (Source/Note -> /)	Reservoir Content (acre-feet)	Surface Area at Content (acres)	Inflow (cfs) (COE)	Release (cfs) /4, /5, /8	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water		Cumulative Total Inflow Stored (acre-feet) /6	Gage Flows		Flow Avail For Stockwater at Trinidad gage (cfs)	Cumulative Flow Avail For Stockwater at Trinidad gage (acre-feet)	Flow Avail. Below Stockwater Diversions (cfs) /7	Cumulative Flow Avail Below Stockwater Diversions (acre-feet) /7
								Released From Storage (cfs) /5, /8	Stock Water From Storage (acre-feet)		Blw Trinidad Dam w/ 5 cfs SW (PURBTRCO) (cfs)	at Trinidad w/ 5 cfs SW (PURTRICO) (cfs)				
Total Days of Diversion/availability													120		32	
Totals (acre-feet)										574.57	0	7,708		1,190		261
Max Rates (cfs)													5		22	
Mean Rate when Diverting (cfs)													5		4	
12/14/84	27,544	797	29.00	2.70	3.99	48	26	0	0	2,613	2.8	5	5	298	0.0	149.8
12/15/84	27,599	799	32.00	2.50	3.99	55	30	0	0	2,672	2.6	5	5	307	0.0	149.8
12/16/84	27,639	799	25.00	2.50	3.99	41	23	0	0	2,717	2.8	5	5	317	0.0	149.8
12/17/84	27,648	800	9.00	2.70	3.99	9	8	0	0	2,729	2.8	5	5	327	0.0	149.8
12/18/84	27,697	800	29.00	2.20	3.98	49	27	0	0	2,782	2.3	5	5	337	0.0	149.8
12/19/84	27,752	801	32.00	2.50	3.98	55	30	0	0	2,841	2.6	5	5	347	0.0	149.8
12/20/84	27,816	803	37.00	2.50	3.98	64	35	0	0	2,909	2.8	5	5	357	0.0	149.8
12/21/84	27,841	804	17.00	2.70	3.99	24	14	0	0	2,937	2.8	5	5	367	0.0	149.8
12/22/84	27,856	805	13.00	3.10	3.99	16	10	0	0	2,957	3.2	5	5	377	0.0	149.8
12/23/84	27,912	805	33.00	2.70	3.98	56	30	0	0	3,017	2.8	5	5	387	0.0	149.8
12/24/84	27,944	808	21.00	3.10	3.98	32	18	0	0	3,053	3.2	5	5	397	0.0	149.8
12/25/84	28,000	807	33.00	2.50	3.98	57	31	0	0	3,113	2.8	5	5	407	0.0	149.8
12/26/84	28,072	808	40.00	2.00	3.98	71	38	0	0	3,188	2.1	5	5	417	0.0	149.8
12/27/84	28,152	810	45.00	2.50	3.98	80	43	0	0	3,272	2.6	5	5	428	0.0	149.8
12/28/84	28,232	811	45.00	2.50	3.97	80	43	0	0	3,356	2.8	5	5	438	0.0	149.8
12/29/84	28,289	813	33.00	2.50	3.98	57	31	0	0	3,416	2.5	5	5	448	0.0	149.8
12/30/84	28,329	814	25.00	2.70	3.98	40	22	0	0	3,460	2.7	5	5	458	0.0	149.8
12/31/84	28,386	814	33.00	2.20	3.97	57	31	0	0	3,521	2.2	5	5	468	0.0	149.8
01/01/85	28,420	815	21.00	3.10	3.98	34	18	0	0	3,557	3.1	5	5	478	0.0	149.8
01/02/85	28,431	816	8.00	2.50	0.00	11	6	0	0	3,588	2.5	5	5	488	0.0	149.8
01/03/85	28,443	816	8.00	2.00	0.00	12	6	0	0	3,580	2	5	5	498	0.0	149.8
01/04/85	28,486	817	24.00	2.00	0.00	44	22	0	0	3,624	2	5	5	508	0.0	149.8
01/05/85	28,545	817	32.00	2.50	0.00	59	30	0	0	3,683	2.5	5	5	518	0.0	149.8
01/06/85	28,595	818	28.00	2.70	0.00	50	25	0	0	3,733	2.7	5	5	528	0.0	149.8
01/07/85	28,653	819	32.00	2.50	0.00	59	30	0	0	3,782	2.5	5	5	538	0.0	149.8
01/08/85	28,728	820	40.00	2.50	0.00	74	38	0	0	3,866	2.5	5	5	548	0.0	149.8
01/09/85	28,777	822	28.00	3.10	0.00	49	25	0	0	3,915	3.1	5	5	558	0.0	149.8
01/10/85	28,804	823	16.00	2.70	0.00	26	13	0	0	3,941	2.7	5	5	568	0.0	149.8
01/11/85	28,836	823	20.00	2.70	0.00	34	17	0	0	3,975	2.7	5	5	578	0.0	149.8
01/12/85	28,857	824	12.00	2.20	0.00	19	10	0	0	3,994	2.2	5	5	588	0.0	149.8
01/13/85	28,909	824	28.00	2.20	0.00	51	26	0	0	4,045	2.2	5	5	598	0.0	149.8
01/14/85	28,951	825	24.00	2.50	0.00	43	22	0	0	4,088	2.5	5	5	608	0.0	149.8
01/15/85	28,995	825	24.00	2.00	0.00	44	22	0	0	4,132	2	5	5	618	0.0	149.8
01/16/85	29,046	828	28.00	2.00	0.00	52	26	0	0	4,184	2	5	5	628	0.0	149.8
01/17/85	29,090	827	24.00	2.20	0.00	43	22	0	0	4,227	2.2	5	5	638	0.0	149.8
01/18/85	29,149	828	32.00	2.00	0.00	60	30	0	0	4,287	2	5	5	648	0.0	149.8
01/19/85	29,200	829	28.00	2.20	0.00	51	26	0	0	4,338	2.2	5	5	658	0.0	149.8
01/20/85	29,235	830	20.00	2.70	0.00	34	17	0	0	4,372	2.7	5	5	668	0.0	149.8
01/21/85	29,261	831	18.00	2.90	0.00	26	13	0	0	4,398	2.9	5	5	678	0.0	149.8
01/22/85	29,295	831	20.00	2.60	0.00	35	18	0	0	4,433	2.6	5	5	688	0.0	149.8
01/23/85	29,340	831	25.00	2.70	0.00	44	22	0	0	4,477	2.7	5	5	698	0.0	149.8
01/24/85	29,382	833	24.00	2.70	0.00	42	21	0	0	4,519	2.7	5	5	708	0.0	149.8
01/25/85	29,440	833	32.00	2.50	0.00	59	30	0	0	4,578	2.5	5	5	718	0.0	149.8
01/26/85	29,482	834	24.00	2.90	0.00	42	21	0	0	4,620	2.9	5	5	728	0.0	149.8

APPENDIX D

Endangered Species Act Consultation



United States Department of the Interior

BUREAU OF RECLAMATION
Eastern Colorado Area Office
11056 West County RD 1&E
Loveland, Colorado 80537-9711



OFFICIAL FILE COPY
RECEIVED

JUN 23 03

IN REPLY
REFER TO:
GP-4200
ENV-7.00

JUN 19 2003

REPLY DATE		
INFO. COPY TO:		
DATE	INITIAL	TO
7-7	ABR	4200
7/14	RF	
CLASSIFICATION		
SERIALS		
CONTROL NO.		
FOLDER I.D.		

MEMORANDUM

To: Supervisor, U.S. Fish and Wildlife Service, Ecological
Colorado Field Office, Lakewood, Colorado

From: Brian Person,
Area Manager

Subject: Federally-Listed Threatened and Endangered Species Associated with Trinidad
Reservoir and Purgatoire River, Colorado

The Bureau of Reclamation is evaluating the environmental consequences of proposed changes to the Operating Principles and Operating Criteria for the Trinidad Dam and Reservoir Project. The changes would allow the City of Trinidad to use a portion of the irrigation pool for municipal and industrial purposes; allow the State of Colorado to use a portion of the irrigation pool for the reservoir recreation/fishery pool; and allow for more efficient stock watering downstream of the reservoir.

Trinidad Reservoir was constructed in 1976 by the Corps of Engineers as a joint water resource project with Reclamation and is authorized for flood control, irrigation, sediment retention, and recreation. Reclamation administers a water supply contract with the Purgatoire River Water Conservancy District.

The action area associated with the proposed action includes Trinidad Reservoir, surrounding Project lands, the Purgatoire River downstream of the reservoir to its confluence with the Arkansas River, and the Arkansas River from its confluence with the Purgatoire River to John Martin Reservoir. In addition, the action area includes that area of Las Animas County below elevation 6,000 feet mean sea level bounded by U.S. Highway 160 on the south, the Purgatoire River on the east, the drainage divide between the Purgatoire River and the Apishapa River on the north, and Interstate 25 on the west. A map is attached that highlights these boundaries.

Reclamation has determined that the following listed, proposed, and candidate species may be present in the action area and, following your written concurrence, intend to consider and evaluate potential effects on these species in a biological assessment.

Threatened or Endangered Species

Bald eagle (*Haliaeetus leucocephalus*)
Piping plover (*Charadrius melodis*)
Interior least tern (*Sterna antillarum*)
Eskimo curlew (*Numenius borealis*)
Black-footed ferret (*Mustela nigripes*)

Proposed Species

Mountain plover (*Charadrius montanus*)

Candidate Species

Arkansas darter (*Etheostoma cragini*)
Black-tailed prairie dog (*Cynomys ludovicianus*)
Lesser prairie-chicken (*Tympanuchus pallidicinctus*)

In addition to requesting written concurrence with this list of species, Reclamation is requesting all information available to the U.S. Fish and Wildlife Service, or references thereto, that would facilitate our evaluation of the potential effects the proposed action may have on these species. We would especially appreciate all available information concerning habitat requirements, current distribution, status of the species, and recent sightings.

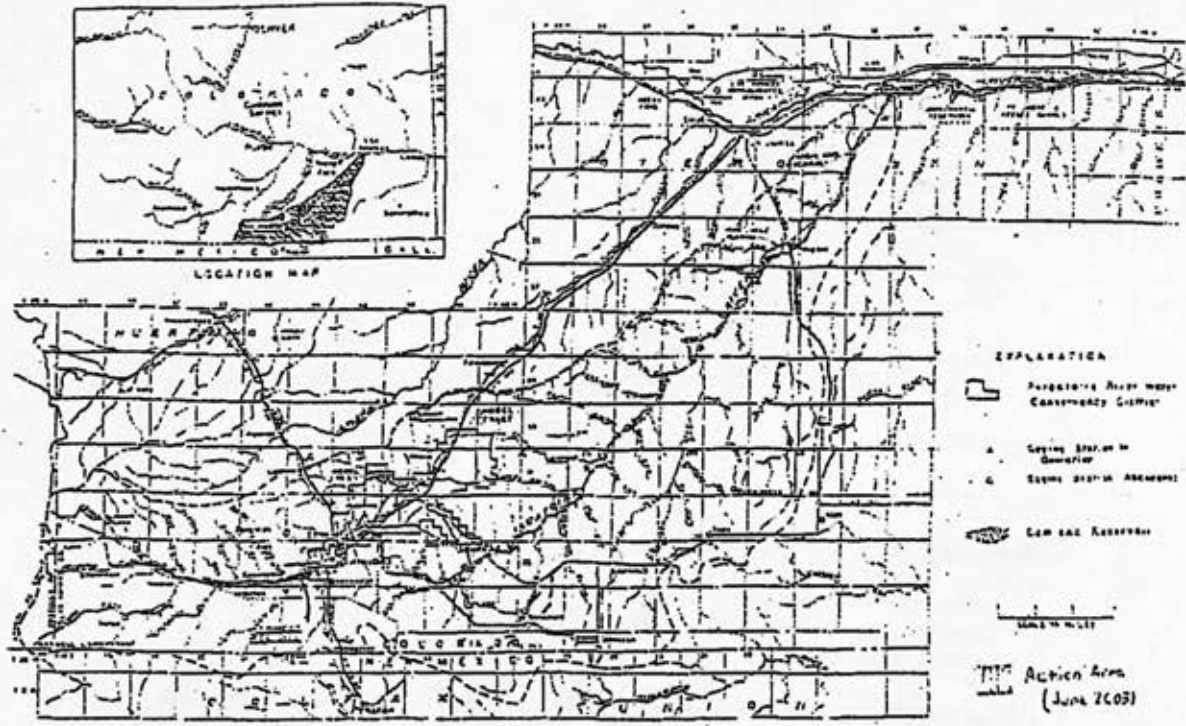
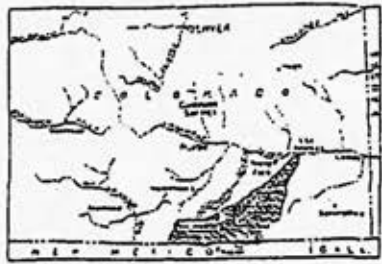
We appreciate your cooperation. Should you have questions concerning this request, you may contact Gary Davis at 406-247-7717.

Attachment -1

bc: GP-4200 (Epperly, Davis) (w/attachment)

EC-1003 (Vehmas), EC-1300 (Johns), EC-1340 (Wilson, Sunde) w/attachment

NOTICE:
YOU DETACH ENCLOSURES, PLEASE
INSERT YOUR CODE NUMBER _____



12



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

OFFICIAL FILE COPY
DECLASSIFICATION
C. AUG-0-1-2003
(744) 1340
1000, 1003, 1005, 1340
1300 SUMNER, WILSON

IN REPLY REFER TO:
ES/CO/LK: T&E/SP List
Mail Stop 65412

JUL 31 2003

MEMORANDUM

To: Brian Person
Area Manager, Bureau of Reclamation, Eastern Colorado Area Office
Loveland, Colorado

From: Susan C. Lirner
Colorado Field Supervisor, U.S. Fish and Wildlife Service
Lakewood, Colorado

Subject: Federally Listed Threatened and Endangered Species Associated with Trinidad Reservoir and Purgatoire River, Colorado

The U.S. Fish and Wildlife Service (Service) received your June 19, 2003 memorandum on June 23, 2003 regarding the proposed changes to the Operating Principles and Operating Criteria for the Trinidad Dam and Reservoir Project. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

The Service concurs with the list of species you have prepared. Please note, however, that the Eskimo curlew (*Numenius borealis*) has been removed from the list of special status species in Colorado, and will therefore not need to be addressed. For your convenience, I am enclosing a copy of the most recent species list, by county, for Colorado.

The Service would be concerned if the proposed action results in a depletion in the amount of water that is currently permitted to flow through the Purgatoire River Basin and/or affects John Martin Reservoir where nesting bald eagles (*Haliaeetus leucocephalus*), least terns (*Sterna antillarum*) and piping plover (*Charadrius melodus*) are known to be. Many of the species on your list depend directly on the river for their migration, breeding and feeding behavior. A disruption of these activities may adversely affect the species as defined in the Endangered Species Act.

Below is a very brief description of the habitat types of the species of concern. It is highly recommended that a more in-depth habitat analysis be accomplished before any conclusions are drawn. Among other places, this information can be found on various web sites (i.e. www.natureserveexplorer.org), the Colorado Breeding Bird Atlas (Published by the Colorado Division of Wildlife), and speaking with species experts from the Colorado Division of Wildlife.

Bald Eagle - Those pairs of bald eagles that breed in Colorado use large, mature cottonwoods or pines to hold their heavy nests (Colorado Breeding Bird Atlas, 1998. H.E. Kinglery, Ed.). Most of the time, they are found on or near large bodies of water that will provide foraging opportunities. Bald eagles feed on fish, waterfowl and carrion and prefer areas that are not heavily impacted by human disturbance.

Official File Copy
File ENV. 400
Project TRINIDAD
Folder I.D. 196458
Copies No. 3/1/03

- Piping plover - Piping plovers nest on sandy beaches, preferably on islands, but water level fluctuations from year to year force movement between sites. In wet years, when water covers island beaches, they have nested on gravel bars or sandstone benches between bands of cliffs (Colorado Breeding Bird Atlas. 1998. H.E. Kinglery, Ed.).
- Interior Least tern - The least tern nest in locations similar to the piping plover, but has shown a very high affinity to sites on islands.
- Mountain plover - Mountain plovers are found primarily in the arid grasslands of the Great Plains, where grass grows no taller than 3 inches tall (Colorado Breeding Bird Atlas. 1998. H.E. Kinglery, Ed.). Nesting plovers choose shortgrass prairie grazed by prairie dogs, bison or cattle, overgrazed tallgrass or fallow fields (Colorado Breeding Bird Atlas. 1998. H.E. Kinglery, Ed.).
- L. Prairie Chicken - Optimal habitat consists of midgrass to tallgrass prairies for nest and winter cover. The forb and shrub component of this rangelands provide foraging substrate (Colorado Breeding Bird Atlas. 1998. H.E. Kinglery, Ed.). Grasshoppers and insects provide the primary food source during the summer, whereas winter food consists largely of plant materials such as seeds and grain (Colorado Breeding Bird Atlas. 1998. H.E. Kinglery, Ed.).
- Arkansas Darter - Preferred habitat: spring-fed creeks with cool, clear water and herbaceous aquatic vegetation, growths of watercress or other aquatic plants. Often in pools with sand, fine gravel, or organic detritus substrate. Eggs are laid in gravel bottoms (www.natureserveexplorer.org).
- Black-tailed pr. dog - Black-tailed prairie dogs typically inhabit short-grass prairies; they usually avoid areas of heavy brush and tall grass, possibly because visibility is considerably reduced. Their food is chiefly plant materials, particularly low-growing weeds and grasses (The Mammals of Texas - Online, www.nsr.ttu.edu).
- Black-footed ferret - Ferrets utilize the same short-grass prairie habitats that the prairie dogs do. The prairie dogs are their primary food source.

Thank you the opportunity to comment on your project. If the Service can be of further assistance, please contact Jeff Peterson at (303) 275-2370.

Encl: Species List

David L. Zinner

12 1/2

F. O. S.

5/10/03 3:24

REC. OF BUREAU

AUG-04-2003 13:29

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective July 10, 2003)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS BY COLORADO

COUNTIES

	A D A M S	A L A M O S A	A R A P A H O E	A R C H U L E T A	B A C A	B E N T	B O U L D E R	B R O O M P I E L D	C H A P P E E	C H E Y E N N E	C L E A R C R E E K	C O N J O S	C O S T I L L A	C R O W L B Y	C U S T E R	D E L T A	D E N V E R
ald eagle, <i>Haliaeetus leucoccephalus</i> , Listed Threatened	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
junco sage-brook, <i>Centrocercus urophasianus</i> , Candidate for Listing		/		/					/			/	/			/	
east tern (interior population), <i>Sterna antillarum</i> , Listed Endangered	*		*			/	*	*			*			/			*
esser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing					/	/				/				/			
Mexican spotted owl, <i>Strix occidentalis incoln</i> , Listed Threatened	/	/	/	/			/		/		/	/	/		/		
Mountain plover, <i>Charadrius montanus</i> , Proposed Threatened	/	/	/		/	/	/	/		/		/	/	/			
Piping plover, <i>Charadrius melodus</i> , Listed Threatened					/	/											
Southern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered		/		/								/	/				
Whopping crane, <i>Grus americana</i> , Listed Endangered	*		*				*	*			*						*
Yellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing		/		/								/	/			/	
Black-footed ferret, <i>Mustela nigripes</i> , Listed Endangered	/	/	/	/	/	/		/		/		/	/	/		/	
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing	/		/		/	/	/	/		/				/			/
Canada lynx, <i>Lynx canadensis</i> , Listed Threatened		/		/			/		/			/	/		/	/	
Purple meadow jumping mouse, <i>Zapus ludsonianus preblei</i> , Listed Threatened	/		/				/	/									/
Boreal owl, <i>Nyctale boreas boreas</i> , Candidate for Listing				/			/		/		/	/				/	

14
 13:29
 AUG-04-2003
 BUREAU
 REC.
 1100000012

U. S. Fish and Wildlife Service
 Ecological Services
 Colorado Field Office

(Revised July 10, 2003)

COUNTIES -

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO

	D O L O R E S	D O U G L A S	E A G L E	R L B E R T	E L P A S O	P R E M O N T	G A R F I E L D	G I L P I N	G R A N D	G U N N I S O N	H I N S D A L E	H U E R P A N O	J A C K S O N	J E F F E R S O N	K I O W A	K I T C A R S O N
ald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
unioison sage-grouse, <i>Centrocercus minimus</i> , Candidate for Listing	/		/				/			/						
ast teal (interior population), <i>Sterna antillarum</i> , Listed Endangered		/	
asser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for List															/	
lexican spotted owl, <i>Strix occidentalis lucida</i> , Listed Threatened	/	/			/	/	/	/				/		/		
ountain plover, <i>Charadrius montanus</i> , Proposed Threatened		/		/	/	/						/	/		/	/
iping plover, <i>Charadrius melodus</i> , Listed Threatened															/	/
outhwestern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered	/										/					
whooping crane, <i>Grus americana</i> , Listed Endangered			
ellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing	/		/				/		/	/	/					
lack-footed ferret, <i>Mustela nigripes</i> , Listed Endangered	/	/	/	/	/	/									/	/
lack-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing	/	/		/	/	/						/		/	/	/
ankla lynx, <i>Lynx canadensis</i> , Threatened	/		/			/	/	/	/	/	/	/	/	/		
reble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened		/		/	/									/		
rkansas darter, <i>Etheostoma caeruleum</i> , Candidate for Listing				/	/	/						/			/	
onytail, <i>Gila elegans</i> , (presumed-historical) Listed Endangered	.	.	.				/					
olorado pikeminnow, <i>Psychrocellus lucius</i> , Listed Endangered					
reenback cutthroat trout, <i>Oncorhynchus clarki stansburii</i> , Listed Threatened		/			/							/				
Hotchkiss Chub, <i>Gila cypha</i> , Listed Endangered	.	.	.				/					

7/000111/1
 R. 00
 54
 217170000
 REC
 BUREAU OF
 US
 13:29
 AUG-04-2003

U. S. Fish and Wildlife Service
 Ecological Services
 Colorado Field Office

(Effective July 10, 2003)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO

COUNTIES -

	L A K E	L A P L A T A	L A R I M E R	L A S A N I M A S	L I N C O L N	L O G A N	M B S A	M I N E R A L	M O P P A T	M O N T E Z U M A	M O N T R O S E	M O R G A N	O T T E R O	O U R A Y	P A R K	P H I L L I P S
Golden Eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Common Sage-grouse, <i>Centrocercus uinimus</i> , Candidate for Listing		/					/			/	/			/		
Least Tern (Interior population), <i>Sterna antillarum</i> , Listed Endangered			.	.	.							/	/		.	
Greater Prairie-chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing					/											
Mexican Spotted Owl, <i>Strix occidentalis lucida</i> , Listed Threatened		/	/	/				/	/	/						/
Mountain Plover, <i>Charadrius montanus</i> , Proposed Threatened			/	/	/	/		/				/	/			/
piping Plover, <i>Charadrius melodus</i> , Listed Threatened				/								/				
Northwestern willow Flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered		/						/		/						
Yellow-billed Cuckoo, <i>Coccyus americanus</i> , Candidate for Listing		/					/	/	/	/	/				/	
Whooping Crane, <i>Grus americana</i> , Listed Endangered			
Black-footed Ferret, <i>Mustela nigripes</i> , Listed Endangered		/	/	/	/				/	/	/	/	/			
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing			/	/	/	/						/	/			/
Canada Lynx, <i>Lynx canadensis</i> , Listed Threatened	/	/	/	/			/	/	/	/	/			/	/	
Merriam's meadow jumping mouse, <i>Zapus merriami preblei</i> , Listed Threatened			/									/				
Arkansas darter, <i>Etheostoma cragini</i> , Candidate for Listing				/	/								/			
Longtail, <i>Gila elegans</i> , (presumed-historical) Listed Endangered								
Colorado pikeminnow, <i>Ptychocheilus lucius</i> , Listed Endangered			
Greenback cutthroat trout, <i>Oncorhynchus clarkii stansburiana</i> , Listed Threatened	/		/													/
Humpback chub, <i>Gila cypha</i> , Listed Endangered								

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective July 10, 2003)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO

SPECIES	COUNTIES														
	PITKIN	PROWERS	PUEBLO	RIOBLANCO	RIOGRANDE	ROST	SAOUCHE	SANJUAN	SANMIGUEL	SEDOWICK	SUMMIT	TELLER	WASHINGTON	WELD	YUMA
ald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
annison sage-grouse, <i>Centrocercus urophasianus</i> , Candidate for Listing	/				/		/		/						
east tern (Incaior population), <i>Sterna nivalis</i> , Listed Endangered		/							/			.	/	/	
east prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing		/													
lexican spotted owl, <i>Strix occidentalis incola</i> , Listed Threatened	/		/		/		/		/		/	/		/	
ountain plover, <i>Charadrius montanus</i> , Proposed Threatened		/	/	/	/		/						/	/	/
iping plover, <i>Charadrius melodus</i> , Listed Threatened		/							/				/	/	
onithwestern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered					/		/	/	/						
whooping crane, <i>Grus americana</i> , Listed Endangered										
ellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing	/			/	/	/	/	/	/		/				
lack-footed ferret, <i>Mustela nigripes</i> , Listed Endangered		/	/	/			/		/				/	/	
lack-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing		/	/						/			/	/	/	/
anada lynx, <i>Lynx canadensis</i> , Listed Threatened	/		/	/	/	/	/	/	/		/				
reble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened														/	
awnock montane skipper, <i>Hesperia leonardus montana</i> , Listed Threatened												/			
ncompagite fritillary butterfly, <i>Boloria acrocnema</i> , Listed Endangered	/				/		/	/	/		/				
Arkansas darter, <i>Etheostoma cruzi</i> , Candidate for Listing		/	/												
onyhall, <i>Gila elegans</i> , (presumed-historical) Listed Endangered				
olorado pikeminnow, <i>Ptychocheilus bicolor</i> , Listed Endangered				

US BUREAU OF RECL.

445-104-2003 1.3.30

TABLE TERMINOLOGY

- ✓ The check mark indicates that the species is present in that county or that the county is within the historical range of the species
- Water depletions in these counties may affect these species
- This sign means that the species is present in the county and there is designated critical habitat for the species within the county
- Candidate** Means there is sufficient information indicating that formal listing under the ESA may be appropriate
- Proposed** Means the species is proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants under the BSA
- Endangered** Means the species could become extinct
- Threatened** Means the species could become endangered

TOTAL P. 08



United States Department of the Interior



BUREAU OF RECLAMATION

Eastern Colorado Area Office
11056 West County RD 18E
Loveland, Colorado 80537-9711

IN REPLY
REFER TO:

EC-1340
ENV-4.00

EXTRA COPY

TO	Initial	Date
4200	De	2/2

MEMORANDUM

To: Supervisor, U.S. Fish and Wildlife Service
Ecological Services, Colorado Field Office
Attn: Ms. Susan Linner

From: Brian Person **Brian Person**
Area Manager

Subject: Biological Assessment (BA) for Amending the Existing Operating Principles and/or Operating Criteria at Trinidad Dam and Reservoir, Colorado

The Bureau of Reclamation is proposing to amend the existing Operating Principles and/or Operating Criteria at Trinidad Dam and Reservoir in Las Animas County, Colorado. The proposed amendments would (1) allow the City of Trinidad to use a portion of the irrigation capacity for municipal and industrial purposes; (2) allow the Colorado Division of Parks and Outdoor Recreation to permanently commit 700 acre-feet of the irrigation capacity to the recreation pool to replace evaporation and seepage losses; and (3) allow for more efficient delivery of stock water within the Purgatoire River Water Conservancy District during the non-irrigation season by permitting stock water to be released at rates greater than the five cubic feet per second that is currently permitted.

A more detailed description of the proposed amendments and their effect on listed species is included in the attached BA. Based on our evaluation, we have determined that the proposed federal action is likely to have beneficial effects on the bald eagle. Accordingly, we are requesting written concurrence that the proposed federal action is not likely to adversely affect the bald eagle.

We would appreciate your expeditious response to this request. Should you have questions or wish to discuss the BA in more detail, you can contact Gary Davis at 406-247-7717 or Paula Sunde at 970-962-4367.

Attachment

cc: Dennis Garcia
Army Corps of Engineers
41010 Jefferson Plaza, NE
Albuquerque, New Mexico 87109-3435
(w/att)

bc: GP-4200 (Davis, Epperly)(w/att)
EC-1003 (Vehmas), EC-1300 (Johns) (w/att)

NOTICE:
IF YOU DETACH ENCLOSURES, PLEASE
INSERT YOUR CODE NUMBER _____

BIOLOGICAL ASSESSMENT

AMENDMENT OF OPERATING PRINCIPLES AND/OR OPERATING CRITERIA AT TRINIDAD RESERVOIR

PURGATOIRE RIVER
LAS ANIMAS COUNTY
COLORADO

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
GREAT PLAINS REGION
Eastern Colorado Area Office

January 21, 2004

TABLE OF CONTENTS

PROPOSED ACTION.....	1
ACTION AREA	1
FEDERALLY-LISTED THREATENED OR ENDANGERED SPECIES AND CANDIDATE SPECIES.....	2
HABITAT REQUIREMENTS, DISTRIBUTION, AND STATUS OF SPECIES	3
METHODS	7
DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION	7
INTERRELATED AND INTERDEPENDENT ACTIONS AND CUMULATIVE EFFECTS ASSOCIATED WITH THE PROPOSED ACTION.....	10
CONSERVATION MEASURES.....	11
DETERMINATIONS OF EFFECT.....	11
REFERENCES CITED.....	13

PROPOSED ACTION

The Bureau of Reclamation (Reclamation) is proposing to approve amendments to the existing Operating Principles and/or Operating Criteria at Trinidad Dam and Reservoir. The proposed amendments would (1) allow the City of Trinidad (Trinidad) to use a portion of the irrigation capacity for municipal and industrial (M&I) purposes; (2) allow the Colorado Division of Parks and Outdoor Recreation (State) to permanently commit 700 acre-feet (af) of the irrigation capacity to the recreation pool to replace evaporation and seepage losses; and (3) more efficiently deliver stock water within the Purgatoire River Water Conservancy District (District) during the non-irrigation season by allowing stock water to be released at rates greater than the five cubic feet per second (cfs) that is currently allowed.

Trinidad Dam and Reservoir was authorized by Congress in 1958 in Public Law 85-500, as amended by Public Law 89-298, and was constructed in 1976 by the U.S. Army Corps of Engineers (Corps) as a joint water resource project with Reclamation. The project is authorized to impound water for flood control, irrigation, sediment retention, and recreation. The Corps owns and operates the reservoir; their major responsibility is for flood control. The State manages recreation activities at the Reservoir through an agreement with the Corps. Reclamation administers a repayment contract with the District which manages the irrigation capacity at the reservoir. Trinidad has acquired rights to 2,800 af of water in the irrigation capacity. The State is in the process of acquiring 700 af of water in the irrigation capacity.

ACTION AREA

The action area associated with the proposed action includes Trinidad Reservoir and adjacent Corps' lands, the Purgatoire River downstream of the reservoir to its confluence with the Arkansas River, and the Arkansas River from its confluence with the Purgatoire River to John Martin Reservoir. In addition, the action area includes Las Animas County below elevation 6,000 feet mean sea level (msl) that is bounded by U.S. Highway 160 on the south; the Purgatoire River on the east; the Las Animas County line and the drainage divide between the Purgatoire River and the Apishapa River on the north; and Interstate 25 on the west.

Trinidad Dam and Reservoir is located on the upper Purgatoire River approximately 2.75 miles upstream and southwest of Trinidad in Las Animas County, Colorado. The watershed contributing to the reservoir covers 671 square miles. The reservoir covers 2,553 surface acres at the maximum pool elevation of 6,279.3 feet msl and zero surface acres (reservoir can be fully drained) at the minimum elevation of 6,115 feet.

The Purgatoire River flows for 167 miles from the reservoir to the Arkansas River. Flows below the dam depend on releases from the reservoir and on tributary contributions, particularly Raton Creek. Releases from the reservoir range from 100 - 300 cfs during the irrigation season (approximately 1 April - 15 October) to minimal or no releases during the rest of the year.

Contributions from Raton Creek maintain some flow in the reach below the dam almost year round.

The reservoir is located in a narrow river valley where geology and vegetation transition from the Rocky Mountains to the Great Plains. Vegetation at the reservoir includes grasses, pinon pine, junipers, cottonwoods, and willows. A sediment delta has formed at the head of the reservoir that supports immature cottonwoods and willows. A small cattail wetland is located near Long's Canyon on the south side of the reservoir. Foothills adjacent to the reservoir are forested with pinon pine, juniper, and gambel oak. Riparian vegetation along the river and tributaries include cottonwood, willow, Siberian elm, box elder, locust, wild plum, and chokecherry. Grasslands in the vicinity of the District support blue grama, western wheatgrass, buffalograss, sagebrush and sand dropseed. Scattered junipers, four-wing saltbrush, soapweed, yucca, rabbitbrush, and prickly pear and cholla cacti are also found in the grasslands.

The Model Land & Irrigation District (ML&ID) is located generally east of the Town of Model and contains irrigated and dryland agricultural land and grasslands. The principal irrigated crop is alfalfa.

FEDERALLY-LISTED THREATENED OR ENDANGERED SPECIES AND CANDIDATE SPECIES

Four species have been listed as threatened or endangered under the ESA that may be present in the action area. Three species have been identified as candidates for listing. No critical habitat has been designated nor proposed in the action area.

Threatened or Endangered Species

Bald eagle (<i>Haliaeetus leucocephalus</i>)	Threatened
Piping plover (<i>Charadrius melodis</i>)	Threatened
Interior least tern (<i>Sterna antillarum</i>)	Endangered
Black-footed ferret (<i>Mustela nigripes</i>)	Endangered

Candidate Species

Arkansas darter (*Etheostoma cragini*)
 Black-tailed prairie dog (*Cynomys ludovicianus*)
 Lesser prairie-chicken (*Tympanuchus pallidicinctus*)

HABITAT REQUIREMENTS, DISTRIBUTION, AND STATUS OF SPECIES

Threatened or Endangered Species

Bald eagle - Bald eagles are large, opportunistic birds of prey that feed largely upon fish and waterfowl. Eagles are associated with rivers, lakes, and reservoirs where large trees provide perch sites for roosting and for locating and securing prey. Fish are the primary source of food. Under adverse conditions, eagles will search for prey in upland areas and will also feed on carrion. If severe winter conditions persist, eagles will concentrate in areas with open water or migrate further south.

Nesting and wintering eagles are found in close association with water that provides a reliable food source and isolation from human disturbance. Eagles wintering in Colorado are thought to originate in the central provinces of Canada and the Great Lakes states. Migrant and wintering bald eagles begin to arrive in the Arkansas River basin in mid- to late-October and begin to leave the area for breeding areas in the north by early March. Adult migrants tend to winter repeatedly in the same area but remain mobile when seeking food during changing winter weather conditions. The Colorado Division of Wildlife (CDOW) (2003) estimates that approximately 800 eagles winter in Colorado. Wintering and migrating eagles can be expected to occur throughout the lower Arkansas River basin.

Bald eagles nest near rivers, lakes, and reservoirs where they select nesting sites free from disturbance. Cottonwood trees are preferred nesting trees in the lower Arkansas River basin. Nests are large and re-used annually. Nesting activities begin in early to mid-March, eggs are laid in late March to early April, and both adults incubate the eggs. Eggs hatch in mid-May and fledging takes place after ten to eleven weeks with immature birds remaining near the nest for another six weeks. The number of active bald eagle nests is increasing in Colorado. In 2001, there were about 51 nesting pairs (CDOW 2003). There are no known active nests in Las Animas County (Gallegos, pers. comm. 2003). The bald eagle has been downlisted to threatened and has been proposed for de-listing.

Piping plover - The piping plover is a migratory shorebird that breeds along prairie rivers, alkali lakes and ponds of the northern Great Plains, on sandy beaches along the Great Lakes, and on the beaches of the Atlantic coast. Its primary food is aquatic invertebrates. Plover populations have fluctuated drastically since 1900 primarily as the result of market hunting. Populations rebounded by the 1920s; however, human encroachment, an increase in the recreational use of sandbars and beaches, channelization and impoundment of rivers, and the resultant modification and destruction of habitat have caused numbers to decline again.

The piping plover is one of three small plovers that can be found in Colorado. In eastern Colorado, plovers occur primarily as migrants and arrive in early April. Most non-breeding plovers leave Colorado by the end of May.

The plover's historic breeding habitat in eastern Colorado included the South Platte and

Arkansas rivers. Plovers can also be found breeding on sandy lake and reservoir shorelines, river sandbars, and sandy wetland pastures. Breeding plovers arrive in eastern Colorado in late April. Plovers are known to nest with interior least terns at John Martin Reservoir on the lower Arkansas River (Kaczmarek, pers. comm. 2003). The piping plover is listed as threatened.

Interior least tern - The interior least tern is the smallest member of the tern family and breeds in southeastern Colorado in the La Junta-Lamar area and in colonies of piping plovers at John Martin Reservoir (Kaczmarek, pers. comm. 2003). Breeding terns are normally associated with unvegetated shorelines, sandbars, and mudflats of rivers and reservoirs. The occurrence of breeding terns is localized and is highly dependent upon the presence of dry, exposed sand and gravel bars and favorable river flows that support a forage base and isolate the bars from the banks. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sand and gravel bars within a wide, unobstructed, water-filled river channel. This swallow-like aquatic bird feeds primarily on small fish, such as shiners (*Notropis* spp.) and plains killifish (*Fundulus kansae*), from shallow water in rivers and lakes.

Terns arrive on breeding sites in mid-May. Both sexes share egg incubation that takes 19 to 25 days. Winter habitat for the interior least tern is currently unknown. The interior least tern is listed as endangered.

Black-footed ferret - The black-footed ferret is a small carnivore about the size of a mink and is considered to be the most endangered mammal in North America. The historic range of the ferret coincides with that of the three species of prairie dogs upon which it depends for food and shelter and includes the short and mid-grass prairies of the Great Plains (Schroeder, 1987). Ferrets inhabit prairie dog towns utilizing abandoned burrows with approximately 90% of their diet consisting of prairie dogs. The remainder of their diet is composed of mice, ground squirrels, rabbits, rats, birds, reptiles, and insects. The demise of the ferret in the mid-1900s coincided with attempts to rid the Great Plains of prairie dogs. What was believed to be the last known ferret died in 1979 in captivity in South Dakota and the species was presumed extinct until it was rediscovered in Wyoming in 1981 (NGPC 1997). The last record of a ferret in Colorado was from 1946 (CDOW 2003).

Historically, ferrets were never abundant (because few people saw or recorded them) in Colorado, but they likely ranged statewide. Prairie dog towns/complexes consisting of more than 80 acres within four miles of one another should be surveyed for the presence of black-footed ferrets (FWS 1993). Small isolated prairie dog colonies are located north and east of Trinidad Reservoir (Kaczmarek, pers. comm. 2003). The black-footed ferret is listed as endangered.

Candidate Species

Arkansas darter - The following information was taken from the Colorado Division of Wildlife webpage (http://wildlife.state.co.us/species_cons/index.asp). The Arkansas darter is a three-inch member of the walleye and perch family. Its body displays 12 to 14 dusky stripes along the sides

with fine black specks on the back and a dark, vertical wedge-shaped spot beneath the eye. During the April-May breeding season, males display bright orange underneath.

Darters feed on a variety of aquatic invertebrates and plant material including small seeds. They prefer shallow, clear streams with sandy substrates, spring-fed pools, and abundant rooted aquatic vegetation.

Darters may spawn throughout spring and summer. Spawning takes place in shallow water over a bottom of coarse gravels. Eggs are usually deposited in open areas on organic material covering sandy substrates. Darters become sexually mature in a year or less.

The Arkansas darter has a very restricted natural range and is the only darter native to the Arkansas River drainage. It is found only in tributaries to the Arkansas River in Colorado, Kansas, Missouri, and Oklahoma. The species is found in the upper Arkansas River, Fountain Creek, Horse Creek, upper Arkansas River at John Martin Reservoir, Big Sandy Creek, Rush Creek, Black Squirrel Creek, and Chico Creek drainages. The darter has never been recorded from the Purgatoire River drainage and appears to be restricted to Arkansas River tributaries that enter the river from the north (Melby, pers. comm. 2003).

Darters are susceptible to predation by introduced fish and degradation of water quality. The Arkansas darter is a candidate species.

Black-tailed prairie dog - The Lewis and Clark expedition of 1804-6 was the first to collect a specimen of the black-tailed prairie dog. It was first described by Ord in 1815 from a specimen taken from the upper Missouri River basin (Hall and Kelson 1959). The black-tailed prairie dog is found in eastern Montana, eastern Wyoming, eastern Colorado, eastern New Mexico, southwestern North Dakota, western and central South Dakota, western and central Nebraska, western and central Kansas, western and central Oklahoma, northwestern Texas, and south-central Canada.

The black-tailed prairie dog is a small, stout rodent having an overall length of 14-17 inches with weights ranging from one to three pounds. The black-tipped tail is characteristic of the species with mixed body colors varying from brown, black, gray, and white (Hoogland 1995). Black-tailed prairie dogs are diurnal, burrowing animals with individuals spending most of their day above ground. They do not hibernate as do other North American prairie dog species (Hoogland 1995). The species is very social living in population aggregations that can contain thousands of individuals and extend for miles (Bailey 1905, King 1955). Within these colonies, prairie dogs live in territorial, harem-polygamous family groups called coteries (Hoogland 1995).

The colonial nature of the black-tailed prairie dog is a significant characteristic of the species. Coloniality offers an effective defense mechanism by aiding in the detection of predators and by deterring predators through mobbing behavior (Hoogland 1995). It increases reproductive success through cooperative rearing of juveniles, and it aids parasite removal through shared grooming. Hoogland (1995) notes that coloniality promotes transmission of disease that can

suppress populations and may be a major factor in population dynamics.

Many authors have recognized the biological importance of the black-tailed prairie dog as a keystone species. Keystone species influence ecosystem function through their activities in unique and significant ways. Prairie dogs act in several roles inasmuch as they are prey, provide shelter, modify vegetation, and influence ecological processes in a manner not entirely duplicated by other prairie herbivores (Wuerthner 1997). Although the black-tailed prairie dog creates habitat for itself and other species, it is also affected by other species. Prairie dogs can create preferential grazing opportunities for herbivores that in turn create opportunities for expansion of prairie dog colonies along their perimeters. Habitat modified by black-tailed prairie dogs is especially important to the black-footed ferret (*Mustela nigripes*), swift fox (*Vulpes velox*), mountain plover (*Charadrius montanus*), ferruginous hawk (*Buteo regalis*), and burrowing owl (*Athene cunicularia*).

The historic range of the black-tailed prairie dog included portions of eleven states, Canada, and Mexico. Its current range occurs from extreme south-central Canada to northeastern Mexico from approximately the 98th meridian west to the Rocky Mountains (FWS 2000). The species is found in scattered populations throughout eastern Colorado below 6,000 feet msl. The largest areas of active prairie dog colonies are located along the Front Range and in southcentral and southeastern portions of the state. A large colony of approximately 100 acres is located south and east of the Purgatoire River outside of the action area (T33S, R60W) (Gallegos, pers. comm. 2003). Small isolated prairie dog colonies are located north and east of Trinidad Reservoir within the action area (Kaczmarek, pers. comm. 2003; Gallegos, pers. comm. 2003); however, these colonies are believed to support primarily white-tailed prairie dogs (Holder, pers. comm. 2003). The species continues to decline due to conversion of grasslands to cropland, urban areas, and other vegetative communities; from structural deterioration of burrows; and from habitat fragmentation (FWS 2000). The black-tailed prairie dog is a candidate species.

Lesser prairie-chicken – The following information was taken from the Colorado Division of Wildlife webpage (http://wildlife.state.co.us/species_cons/index.asp). The lesser prairie chicken is mostly brown in color with horizontal barring, short rounded tails and about the size of a small chicken. Males have reddish air sacs on their necks that are inflated during mating courtship displays. Lesser prairie chickens historically occupied the grasslands of Texas, Oklahoma, New Mexico, Kansas, and southeastern Colorado. They prefer sandy grasslands having an abundance of mid-height grasses, sandsage, and yucca. During summer, they feed on grasshoppers and other insects. During winter, their food source consists of seeds, leaves, grain, and milo from agricultural areas.

Lesser prairie chickens are polygamous with males attracting females to leks with elaborate dancing displays. Males also inflate their red air sacs and display their yellow combs. Hens typically lay 12 eggs.

Populations have declined as a result of conversion of grasslands and overgrazing. In Colorado, most of the birds are found in the Comanche National Grassland near the Town of Campo in the

southeastern corner of the state. Smaller groups of birds are found south of the Town of Holly, east of the Town of Eads, and south of the Cimarron River. One group of birds was released in sadsage-yucca habitat east of the City of Pueblo in an effort to establish another population. The lesser prairie chicken is not found in Las Animas County (Kaczmarek, pers. comm. 2003). The lesser prairie chicken is a candidate species.

METHODS

Information about these species was collected through a review of existing literature and internet sources and through contact with knowledgeable individuals from the FWS, Colorado Division of Wildlife (CDOW), and Reclamation. The species addressed in this BA were identified by the Fish and Wildlife Service on July 31, 2003, as possibly being present in the action area.

There was little published technical or general literature available that pertained specifically to the Purgatoire River basin. Where available, information was cited for areas thought to contain analogous habitat types or conditions. Much of the distribution and habitat information was taken from the CDOW website (<http://wildlife.state.co.us>).

Hydrologic data for the stock watering analysis were provided by Reclamation model.

DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION

Environmental Baseline

The proposed action contains three components that have potential to affect flows in the Purgatoire River and elevation levels in Trinidad Reservoir. These components include conversion of irrigation water to M&I uses, use of irrigation water to offset the loss of recreation pool water in the reservoir, and modifications to releases for stock water purposes. Each of these components is evaluated against their relative environmental baseline.

The environmental baseline for the conversion of irrigation water to M&I uses is the continued leasing of water from Trinidad back to irrigators in the District until there are M&I needs for the water. The District irrigators currently lease approximately 2,800 af from Trinidad. This water would continue to either be passed through the reservoir for irrigation use or stored in the irrigation capacity of the reservoir and released later for irrigation use. This water is conveyed down the Purgatoire River and diverted approximately 8 miles downstream at the Model headgate. Approximately 35% of this irrigation water returns to the Purgatoire River at various locations downstream of the Hoehne Headgate, which is approximately 13 miles downstream of Trinidad Dam and 5 miles downstream of the Model headgate.

The environmental baseline for conversion of 700 af of the irrigation capacity water to the recreation pool for replacement of evaporation and seepage losses in the reservoir involves continued use of this water by ML&ID for irrigation purposes. This water would continue to

either be passed through the reservoir for irrigation use or stored in the irrigation capacity of the reservoir and released later for irrigation use. This water is conveyed down the Purgatoire River and diverted at the Model headgate. Approximately 35% of this irrigation water returns to the Purgatoire River at various locations downstream of the Hoehne Headgate. Recreation pool evaporation and seepage losses would continue to average approximately 1,060 af annually and may only be replaced occasionally when favorable hydrologic conditions exist for the State to make a one-time purchase of water to replace recreation pool losses. Consequently, the recreation pool will drop several thousand acre-feet before being refilled.

The environmental baseline for modification of reservoir releases for stock water purposes includes continued release and diversion of a portion of the water available for stockwatering. The gains typically range from approximately 0.5 to 3 cfs. The District is permitted to release 1,200 af for stock water purposes from January through March, but currently releases much less than this because of the inefficiency of delivering water at 5 cfs or less. These 5 cfs diversions include gains to the river between Trinidad Dam and the Trinidad gage (PURTRICO), an approximate 3 mile reach of the river, and sufficient releases from the reservoir, that when combined with the gains do not exceed 5 cfs at the Trinidad gage. Diversion of this water can vary from year-to-year, but is generally expected to occur for several days each non-irrigation season. On days when no stockwater diversions are made, gains to the river flow downstream of the District and are available for appropriation by other water users. Unused portions of the 1,200 af allowance for stockwatering remain in the reservoir for use during the irrigation season.

Effects of the Proposed Action

Once the proposed action goes into effect, leasing water back to irrigators until M&I uses are developed will continue and therefore does not alter environmental baseline conditions for that component. When irrigation water begins to be used for M&I purposes, irrigation return flows that normally return to the river below the Hoehne Headgate would then be released directly from the reservoir to compensate for the loss of irrigation return flows. This practice is identified in Trinidad's water decrees, which specify that historic irrigation return flows of 35% of the water right must be released from the reservoir in a pattern similar to historic return flows when irrigation water is converted to M&I uses. To mimic historic irrigation return flows, 25% is released during the irrigation season and the remaining 10% released during the non-irrigation season. These non-irrigation season releases, which historically returned to the river below Hoehne headgate during the non-irrigation season, result in additional flow in the Purgatoire River between Trinidad Dam and the Hoehne headgate, a 13-mile reach of the river.

There would be no return flows from developed M&I uses because Trinidad is permitted to use the consumptive portion of their water right, once developed, to extinction, and M&I return flows are expected to be re-used.

When irrigation water begins to be used for M&I purposes, previously irrigated land will no longer be cultivated and will be converted to grassland and pasture. Based on the analysis for the change in use of these water rights, approximately 2,000 acres could eventually be affected by

this action (Wheeler 1992).

Water used to replace recreation pool seepage and evaporation would now be stored in the reservoir and no longer released to the river for irrigation use. However, that portion of the irrigation water that would have returned to the river as irrigation return flows (approximately 35% or a maximum of approximately 377 af) would be released directly from the reservoir in a pattern similar to historic irrigation return flows. To mimic historic irrigation return flows, once the water right change is decreed, 25% would be released during the irrigation season and the remaining 10% would be released during the non-irrigation season. These non-irrigation season releases, which historically returned to the river below Hoehne headgate during the non-irrigation season, result in additional flow in the Purgatoire River between Trinidad Dam and the Hoehne headgate, a 13-mile reach of the river (Wheeler 2002).

When irrigation water begins to be used to replace recreation pool losses, previously irrigated land will no longer be cultivated and will be converted to grassland and pasture. Based on the analysis for the change in use of these water rights, an estimated 805 acres would be affected by this action (Wheeler 2002).

Water released from the reservoir for stock water is expected to be at rates of 100 cfs or less. These releases are expected to generally occur over a period of about nine days - three releases three days long each from January through March. When releases are made for stock water, the gains would be diverted and lost from the stream. When these releases are not made, there would be no diversion at District headgates and gains would flow past the headgates and be available for appropriation by water users downstream of the District. This pattern of diversion of the gains is not expected to alter environmental baseline conditions.

Under the proposed action, the full 1,200 af of stored water available for stock watering is expected to be released.

Threatened or endangered species

Bald eagle - The eagle may occasionally visit the Purgatoire River valley and Trinidad Reservoir during winter. Once water is used for M&I and recreation pool purposes and non-irrigation season historic return flow releases are being made from the reservoir, there will be higher flows in the river (a maximum of 3.2 cfs in winter) between the dam and the Hoehne Headgate (13 river miles below the dam and where return flows to the river are assumed to begin) during the non-irrigation season, enhancing aquatic, wetland, and riparian habitat necessary to support prey species utilized by eagles.

The proposed recreation pool and stock watering changes have the potential individually to affect the recreation pool and irrigation capacity, but cumulatively the proposed changes result in no adverse effect to the elevation level of Trinidad Reservoir. Recreation pool use of water from the irrigation capacity to replace evaporation and seepage will maintain higher winter storage levels in Trinidad Reservoir. Stock water releases are currently only partially used, but under the

proposed action full use of the 1,200 af allowance is expected. This would result in an annual reduction in reservoir volume of several hundred acre-feet during the winter months. Therefore, when considered together, these actions will very nearly or fully offset each other. Consequently, they are expected to result in either no effects or possibly a minor increase in storage.

Interior least tern/piping plover - These two species are addressed in common because of their similarity in habits and habitat requirements. Terns and plovers nest at John Martin Reservoir on the Arkansas River downstream of its confluence with the Purgatoire River. Neither species is known to nest along the Purgatoire River (Kaczmarek, pers. comm. 2003). There would be no change in flows in the Purgatoire River below the District during the months when terns and plovers would be nesting at John Martin Reservoir.

Black-footed ferret - Ferrets cohabitate with prairie dogs in large colonies. Only small, isolated prairie dog colonies are located within the action area and those occur outside of the District. The proposed action does include activities that would encourage changes in land use from cultivated use to grassland or pasture use within the District. This change in land use could create potential habitat for prairie dogs, that might result in potential black-footed ferret habitat. However, since there have been no confirmed sightings of ferrets in the state since 1946, it is unlikely that ferrets would inhabit the restored grasslands.

Candidate species

Arkansas darter - The Arkansas darter is not found in the Purgatoire River basin (Melby, pers. comm. 2003). The proposed action is not expected to alter Arkansas River flows.

Black-tailed prairie dog - A large prairie dog colony of approximately 100 acres is located south and east of the Purgatoire River outside of the action area. Small isolated prairie dog colonies are located north and east of Trinidad Reservoir within the action area but outside of the District; however, these colonies are believed to support primarily white-tailed prairie dogs (Holder, pers. comm. 2003). The proposed action does include activities that would encourage changes in land use from cultivated use to grassland or pasture use within the District. This change in land use would create potential habitat for black-tailed prairie dogs.

Lesser prairie-chicken - The lesser prairie-chicken is not found in Las Animas County. The closest known populations are found in Baca County.

INTERRELATED AND INTERDEPENDENT ACTIONS AND CUMULATIVE EFFECTS ASSOCIATED WITH THE PROPOSED ACTION

Threatened or endangered species

Bald eagle

There are no known interrelated or interdependent actions nor cumulative effects relative to non-federal actions associated with the proposed action.

Interior least tern and piping plover

There are no known interrelated or interdependent actions nor cumulative effects relative to non-federal actions associated with the proposed action.

Black-footed ferret

There are no known interrelated or interdependent actions nor cumulative effects relative to non-federal actions associated with the proposed action.

CONSERVATION MEASURES

No conservation measures are being proposed.

DETERMINATIONS OF EFFECT

Threatened or endangered species

Bald eagle

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action may affect but not adversely affect (beneficially affect) the bald eagle.

Piping plover

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the piping plover.

Interior least tern

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the interior least tern.

Black-footed ferret

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the black-footed ferret.

Candidate species

Arkansas darter

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the Arkansas darter.

Black-tailed prairie dog

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action has the potential to beneficially affect the black-tailed prairie dog.

Lesser prairie-chicken

Based upon our analysis of the effects of the proposed action, the current and potential status of this species in the Purgatoire River basin, and other land use activities in the area, we conclude the proposed action will have no effect on the lesser prairie-chicken.

REFERENCES CITED

- Bailey, V., 1905. Biological survey of Texas. U.S. Department of Agriculture, Bureau of Biological Survey. North American Fauna No. 25. Washington DC.
- Colorado Division of Wildlife, 2003. Natural Diversity Information Source webpage, <http://wildlife.state.co.us>. Denver CO.
- Gallegos, J., 2003. Personal communication to Gary Davis, Bureau of Reclamation. Colorado Division of Wildlife, Trinidad, Colorado.
- Hall, E.R. and K.R. Kelson, 1959. *The Mammals of North America*, Volume 1. Ronald Press, New York, New York.
- Holder, B., 2003. Personal communication to Gary Davis, Bureau of Reclamation. Colorado Division of Wildlife, Trinidad, Colorado.
- Hoogland, J.L., 1995. *The black-tailed prairie dog*. University of Chicago Press. Chicago, Illinois.
- Kaczmarek, K., 2003. Personal communication to Gary Davis, Bureau of Reclamation. Colorado Division of Wildlife, Denver, Colorado.
- King, J.A., 1955. Social behavior, social organization, and population dynamics in a black-tailed prairie dog town in the Black Hills of South Dakota. *Contrib. Lab. Vert. Biol.* University of Michigan. Ann Arbor, Michigan.
- Melby, J., 2003. Personal communication to Gary Davis, Bureau of Reclamation. Colorado Division of Wildlife. Pueblo, Colorado.
- Nebraska Game and Parks Commission, 1997. Nebraska's Threatened and Endangered Species - Interior Least Tern. Nebraska Game and Parks Commission, Lincoln, Nebraska.
- Schroeder, M., 1987. The Black-footed Ferret. Audubon Wildlife Report 1987/1988. Academic Press, Incorporated, Harcourt Brace Jovanovitch, Publishers.
- U.S. Fish and Wildlife Service, 2002a.
- _____, 2002b.
- _____, 2001. Proposed Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover. *Federal Register*. June 12, 2001
- _____, 2000. Twelve month administrative finding for the black-tailed prairie dog.

Denver, Colorado.

_____, 1993. Unpublished memorandum. Grand Island, Nebraska

Wheeler, W. W. and Associates, Inc., 1998. City of Trinidad Change of Water Rights Case No. 88CW61. Englewood, Colorado.

_____, 2002. Model Ditch Change of Water Rights. Englewood, Colorado.

Wuerthner, G., 1997. Viewpoint: the black-tailed prairie dog - headed for extinction? *Journal of Range Management* 50:459-466.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215-5599

IN REPLY REFER TO:
ES/CO:BR/T&E
MS 65412 LK

FEB 20 2004

Memorandum

To: Area Manager, Eastern Colorado Area Office, Bureau of Reclamation, Loveland, Colorado
From: Field Supervisor, Ecological Services, Lakewood, Colorado
Subject: Biological Assessment for Amending the Existing Operating Principles and/or Operating Criteria at Trinidad Dam and Reservoir, Colorado

The U.S. Fish and Wildlife Service received your memorandum of January 26, 2004, regarding the Bureau of Reclamation's proposal to amend the existing operating principles and/or operating criteria at Trinidad Dam and Reservoir in Las Animas County, Colorado. You requested concurrence with your determination that the bald eagle is likely to be beneficially affected by the proposed action and would not be adversely affected by the proposed action.

Based on the information you have provided, the Service concurs that the proposed action is likely to beneficially affect the bald eagle and is not likely to adversely affect the bald eagle. Further, we concur that the proposed action will have no effect on other federally-listed threatened or endangered species. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

If the Service can be of further assistance, contact Peter Plage of this office at (303)275-2370.

cc: Plage

PPlage:T&E2004.02.02.1104

Official File Copy	
File Code	IAITD-4.00
Project	TRINIDAD
Folder I.D.	
Control No.	

OFFICIAL FILE COPY		
RECLAMATION		
FEB 23 2004		
Date _____		
File	Source	Dist
1340		
Copy to _____		

Table 4
Trinidad Reservoir - Stock Water Modeling During Non-Irrigation Season
Water Year 1985
Reservoir Operations and River Gage Flows with Stock Water Releases of Inflow to Make 5 cfs Available

Date (Source/Note ->) /1	Reservoir Content (acre-feet)	Surface Area at Content (acres)	Inflow (cfs) (COE)	Release (cfs) 14, 15, 18	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) 18	Stock Water		Cumulative Stock Water (acre-feet) 18	Cumulative Total Inflow Stored (acre-feet) 18	Gage Flows		Flow Avail. For Stockwater at Trinidad gage (cfs)	Cumulative Flow Avail. For Stockwater at Trinidad gage (acre-feet)	Flow Avail. Below Stock water Diversions (cfs) 17	Cumulative Flow Avail. Below Stockwater Diversions (acre-feet) 17
								Released From Storage (cfs) 15, 18	From Storage (acre-feet)			Blw Trinidad Dam w/ 5 cfs SW (PURTRICO) (cfs)	at Trinidad w/ 5 cfs SW (PURTRICO) (cfs)				
Total Days of Diversion/availability						574.57			0	7,708			120		32		
Totals (acre-feet)													5	1,190	22	261	
Max Rates (cfs)													5		4		
Mean Rate when Diverting (cfs)													5				
01/27/85	29,532	834	28.00	2.70	0.00	50	25	0	0	4,670		2.7	5	734	0.0	149.8	
01/28/85	29,578	835	25.00	3.10	0.00	43	22	0	0	4,713		3.1	5	744	0.0	149.8	
01/29/85	29,601	836	18.00	3.10	0.00	26	13	0	0	4,739		3.1	5	754	0.0	149.8	
01/30/85	29,610	837	8.00	3.50	0.00	9	5	0	0	4,748		3.5	5	764	0.0	149.8	
01/31/85	29,621	837	8.00	2.70	0.00	11	5	0	0	4,759		2.7	5	774	0.0	149.8	
02/01/85	29,627	837	4.00	1.00	0.00	6	3	0	0	4,765		1	5	783	0.0	149.8	
02/02/85	29,640	837	8.00	1.20	0.00	13	7	0	0	4,778		1.2	5	793	0.0	149.8	
02/03/85	29,668	837	29.00	1.00	0.00	56	28	0	0	4,834		1	5	803	0.0	149.8	
02/04/85	29,731	838	20.00	2.20	0.00	35	18	0	0	4,869		2.2	5	813	0.0	149.8	
02/05/85	29,759	838	18.00	2.00	0.00	28	14	0	0	4,897		2	5	823	0.0	149.8	
02/06/85	29,786	839	18.00	2.50	0.00	27	14	0	0	4,924		2.5	5	833	0.0	149.8	
02/07/85	29,812	839	18.00	2.70	0.00	26	13	0	0	4,950		2.7	5	843	0.0	149.8	
02/08/85	29,856	839	25.00	2.70	0.00	44	22	0	0	4,994		2.7	5	853	0.0	149.8	
02/09/85	29,888	840	21.00	5.00	0.00	32	16	0	0	5,026		5	5	863	0.0	149.8	
02/10/85	29,938	840	29.00	5.00	0.00	48	24	0	0	5,074		5	5	873	0.0	149.8	
02/11/85	29,970	841	20.00	2.70	0.00	34	17	0	0	5,108		2.7	5	883	0.0	149.8	
02/12/85	30,015	841	25.00	2.50	0.00	45	23	0	0	5,153		2.5	5	893	0.0	149.8	
02/13/85	30,083	842	37.00	2.50	0.00	68	35	0	0	5,221		2.5	5	902	0.0	149.8	
02/14/85	30,142	843	33.00	3.10	0.00	59	30	0	0	5,280		3.1	5	912	0.0	149.8	
02/15/85	30,209	843	37.00	3.30	0.00	67	34	0	0	5,347		3.3	5	922	0.0	149.8	
02/16/85	30,278	844	37.00	3.30	0.00	67	34	0	0	5,414		3.3	5	932	0.0	149.8	
02/17/85	30,326	846	29.00	3.70	0.00	50	25	0	0	5,464		3.7	5	942	0.0	149.8	
02/18/85	30,377	846	29.00	3.50	0.00	51	26	0	0	5,515		3.5	5	952	0.0	149.8	
02/19/85	30,427	848	29.00	3.70	0.00	50	25	0	0	5,565		3.7	5	962	0.0	149.8	
02/20/85	30,489	847	25.00	3.70	0.00	42	21	0	0	5,607		3.7	5	972	0.0	149.8	
02/21/85	30,520	847	29.00	3.50	0.00	51	26	0	0	5,658		3.5	5	982	0.0	149.8	
02/22/85	30,562	848	25.00	3.50	0.00	43	22	0	0	5,701		3.5	5	992	0.0	149.8	
02/23/85	30,630	848	37.00	3.10	0.00	67	34	0	0	5,768		3.1	5	1,002	0.0	149.8	
02/24/85	30,673	849	25.00	2.90	0.00	44	22	0	0	5,812		2.9	5	1,012	0.0	149.8	
02/25/85	30,733	850	33.00	3.10	0.00	59	30	0	0	5,871		3.1	5	1,022	0.0	149.8	
02/26/85	30,782	850	20.00	5.00	0.00	30	15	0	0	5,901		5	5	1,031	0.0	149.8	
02/27/85	30,800	851	24.00	5.00	0.00	38	19	0	0	5,939		5	5	1,041	0.0	149.8	
02/28/85	30,840	851	25.00	5.00	0.00	40	20	0	0	5,979		5	5	1,051	0.0	149.8	
03/01/85	30,885	851	25.00	2.00	0.00	46	23	0	0	6,025		2.1	5	1,061	0.0	149.8	
03/02/85	30,924	851	21.00	1.50	0.00	39	20	0	0	6,064		1.5	5	1,071	0.0	149.8	
03/03/85	30,954	852	17.00	1.80	0.00	30	15	0	0	6,094		1.8	5	1,081	0.0	149.8	
03/04/85	30,992	852	22.00	2.20	1.98	37	20	0	0	6,133		2.3	5	1,091	0.0	149.8	
03/05/85	31,020	852	18.00	2.50	1.98	29	16	0	0	6,164		2.6	5	1,101	0.0	149.8	
03/06/85	31,066	853	28.00	2.20	1.98	45	24	0	0	6,211		2.2	5	1,111	0.0	149.8	
03/07/85	31,077	853	10.00	2.20	3.98	12	8	0	0	6,226		2.2	5	1,121	0.0	149.8	
03/08/85	31,108	853	20.00	2.50	5.94	29	18	0	0	6,261		2.5	5	1,131	0.0	149.8	
03/09/85	31,153	854	29.00	2.20	5.94	47	27	0	0	6,314		2.2	5	1,141	0.0	149.8	
03/10/85	31,191	854	25.00	1.80	7.91	38	23	0	0	6,360		1.8	5	1,150	0.0	149.8	
03/11/85	31,259	855	38.00	0.00	7.91	97	38	0	0	6,435		0	5.7	1,160	0.7	151.1	

Table 4
Trinidad Reservoir - Stock Water Modeling During Non-Irrigation Season
Water Year 1985
Reservoir Operations and River Gage Flows with Stock Water Releases of Inflow to Make 5 cfs Available

Date (Source/Note →) /1	Reservoir Content (acre-feet)	Surface Area at Content (acres)	Inflow (cfs) (COE)	Release (cfs) /4, /5, /8	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water Released (cfs) /5, /8	Cumulative Stock Water From Storage (acre-feet)	Cumulative Total Inflow Stored (acre-feet) /8	Gage Flows		Flow Avail. For Stockwater at Trinidad gage (cfs)	Cumulative Flow Avail. For Stock water at Trinidad gage (acre-feet)	Flow Avail. Below Stock water Diversions (cfs) /7	Cumulative Flow Avail. Below Stockwater Diversions (acre-feet) /7
											Blw Trinidad Dam w/ 5 cfs SW (PURBTRCO) (cfs)	at Trinidad w/ 5 cfs SW (PURTRICO) (cfs)				
Total Days of Diversion/availability												120		32		
Totals (acre-feet)						574.57	0			7,708				1,190		261
Max Rates (cfs)												5		22		
Mean Rate when Diverting (cfs)												5		4		
03/12/85	31,334	855	42.00	0.00	7.91	75	42	0	0	6,518	0.1	8	5	1,170	1.0	153.1
03/13/85	31,383	856	29.00	0.20	7.91	49	29	0	0	6,575	0.4	5	5	1,180	0.0	153.1
03/14/85	31,439	857	33.00	0.80	7.91	56	32	0	0	6,539	1	5	5	1,190	0.0	153.1
03/15/85	31,495	858	33.00	1.00	7.91	56	32	0	0	6,702	1.2	5	0	1,190	5.0	163.0
03/16/85	31,570	858	42.00	0.00	7.90	75	42	0	0	6,785	0.2	4.2	0	1,190	4.2	171.4
03/17/85	31,620	859	29.00	0.00	7.90	50	29	0	0	6,843	0.2	3.8	0	1,190	3.8	178.9
03/18/85	31,679	860	34.00	0.00	7.90	60	34	0	0	6,910	0.2	4	0	1,190	4.0	186.8
03/19/85	31,721	860	25.00	0.00	7.90	42	25	0	0	6,960	0.2	4.2	0	1,190	4.2	195.2
03/20/85	31,804	861	46.00	0.00	7.89	83	46	0	0	7,051	0.2	4	0	1,190	4.0	203.1
03/21/85	31,858	863	30.00	0.00	7.91	52	30	0	0	7,111	0.2	3.5	0	1,190	3.5	210.1
03/22/85	31,898	863	25.00	0.00	7.91	42	25	0	0	7,161	0.2	3.8	0	1,190	3.8	217.6
03/23/85	31,939	864	25.00	0.00	7.91	42	25	0	0	7,211	0.2	3.5	0	1,190	3.5	224.5
03/24/85	31,999	864	35.00	0.00	9.89	60	35	0	0	7,280	0.2	3.2	0	1,190	3.2	230.9
03/25/85	32,051	865	34.00	0.00	15.82	52	34	0	0	7,347	0.2	3.2	0	1,190	3.2	237.2
03/26/85	32,078	866	25.00	0.00	23.74	26	25	0	0	7,397	0.2	4	0	1,190	4.0	245.2
03/27/85	32,128	866	38.00	0.00	23.73	52	38	0	0	7,472	0.2	4	0	1,190	4.0	253.1
03/28/85	32,180	867	31.00	0.00	9.89	52	31	0	0	7,533	0.2	4	0	1,190	4.0	261.0
03/29/85	32,235	867	30.00	0.00	3.96	56	30	0	0	7,593	0	0	0	1,190	0.0	261.0
03/30/85	32,299	868	37.00	0.00	9.92	63	37	0	0	7,668	0	0	0	1,190	0.0	261.0
03/31/85	32,334	869	21.00	0.00	5.97	36	21	0	0	7,708	0	0	0	1,190	0.0	261.0

See list of footnotes after Table 5.

Table 5
Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
Water Year 1985

Reservoir Operations and River Gage Flows with Stock Water Releases Made at Alternative Rates

Date (Source/Note -> /)	Alternate Stockwater Surface Content at Content (acre-feet) (acres)		Inflow (cfs) (COE)	Release Rate 64.9 (cfs) /4, /8, /9		Evap. (acre-feet)	Change In Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water Cumulative Released From Storage (cfs) /8, /9		Cumulative Stock Water (acre-feet) /8	Cumulative Total Inflow Stored (acre-feet) /8	Gage Flows Shw Trinidad Dam w/ Alternate SW [PURBTRCO] (cfs)		at Trinidad w/ Alternate SW [PURTRICO] (cfs)	Flow Avail For Stockwater at Trinidad gage (cfs) /10	Cumulative Flow Avail For Stockwater at Trinidad gage (acre-feet) /10	Flow Avail. Below Stockwater Diversions (cfs) /7	Cumulative Flow Avail. Below Stockwater Diversions (acre-feet) /7	
Total Days of Diversion/availability Totals (acre-feet)						571.83					704	7,886				9		130		791
Max Rates (cfs)																88		27		
Mean Rate when Diverting (cfs)																67		3		
10/31/84	25,201											0								
11/01/84	25,268	761	36.00	0.00	5.94	85	36	0	0	0	71		0.1	3.2		0	0	3.2	6.3	
11/02/84	25,348	762	47.00	0.00	13.88	79	47	0	0	0	164		0.1	3.0		0	0	3.0	12.3	
11/03/84	25,395	763	32.00	0.00	13.87	60	32	0	0	0	227		0.1	3.0		0	0	3.0	18.2	
11/04/84	25,476	763	42.00	0.00	3.98	79	42	0	0	0	310		0.1	2.5		0	0	2.5	23.2	
11/05/84	25,548	765	40.00	0.00	5.94	73	40	0	0	0	389		0.1	2.8		0	0	2.8	28.8	
11/06/84	25,630	766	48.00	0.00	9.91	81	48	0	0	0	480		0.1	2.8		0	0	2.8	34.3	
11/07/84	25,887	767	35.00	0.00	11.89	58	35	0	0	0	549		0.1	2.8		0	0	2.8	39.9	
11/08/84	25,753	768	39.00	0.00	11.89	65	39	0	0	0	628		0.1	2.8		0	0	2.8	45.4	
11/09/84	25,790	769	22.00	0.00	5.95	38	22	0	0	0	670		0.1	2.8		0	0	2.8	51.0	
11/10/84	25,842	769	30.00	0.00	7.92	62	30	0	0	0	730		0.1	2.8		0	0	2.8	56.5	
11/11/84	25,923	770	44.00	0.00	5.93	81	44	0	0	0	817		0.1	3.2		0	0	3.2	62.9	
11/12/84	25,989	772	37.00	0.00	7.92	65	37	0	0	0	890		0.1	3.2		0	0	3.2	69.2	
11/13/84	26,062	773	43.00	0.00	11.89	73	43	0	0	0	975		0.1	2.8		0	0	2.8	74.8	
11/14/84	26,100	774	23.00	0.00	7.93	38	23	0	0	0	1,021		0.0	2.8		0	0	2.8	80.3	
11/15/84	26,159	774	32.00	0.00	3.97	60	32	0	0	0	1,084		0.0	3.2		0	0	3.2	86.7	
11/16/84	26,227	775	36.00	0.00	3.98	67	36	0	0	0	1,155		0.0	3.2		0	0	3.2	93.0	
11/17/84	26,272	777	25.00	0.00	3.97	48	25	0	0	0	1,205		0.0	3.5		0	0	3.5	100.0	
11/18/84	26,332	778	33.00	0.00	5.94	60	33	0	0	0	1,270		0.0	3.5		0	0	3.5	106.9	
11/19/84	26,371	778	23.00	0.00	5.95	40	23	0	0	0	1,318		0.0	0.0		0	0	0.0	106.9	
11/20/84	26,292	779	28.00	64.90	5.95	-79	0	37	73	1,316		64.9	64.9		64.9	129	0.0	0.0	106.9	
11/21/84	26,223	778	33.00	64.90	5.93	-69	0	32	136	1,316		64.9	64.9		64.9	257	0.0	0.0	106.9	
11/22/84	26,148	777	29.00	64.90	5.92	-77	0	36	208	1,318		65.0	67.0		67	390	0.0	0.0	106.9	
11/23/84	26,219	775	40.00	0.00	5.90	73	40	0	208	1,395		0.1	2.3		0	390	2.3	2.3	111.5	
11/24/84	26,271	777	29.00	0.00	5.91	52	29	0	208	1,453		0.1	2.5		0	390	2.5	2.5	116.4	
11/25/84	26,323	778	29.00	0.00	5.91	52	29	0	208	1,511		0.0	2.3		0	390	2.3	2.3	121.0	
11/26/84	26,374	778	29.00	0.00	5.91	52	29	0	208	1,569		0.0	2.3		0	390	2.3	2.3	125.6	
11/27/84	26,396	779	14.00	0.00	5.91	22	14	0	208	1,597		0.0	2.5		0	390	2.5	2.5	130.5	
11/28/84	26,440	779	25.00	0.00	5.91	44	25	0	208	1,647		0.1	2.3		0	390	2.3	2.3	135.1	
11/29/84	26,478	780	21.00	0.00	5.91	36	21	0	208	1,689		0.0	2.1		0	390	2.1	2.1	139.2	
11/30/84	26,519	790	25.00	0.00	5.90	44	25	0	208	1,739		0.1	1.9		0	390	1.9	1.9	143.0	
12/01/84	26,571	781	28.00	0.00	3.94	52	28	0	208	1,795		0.1	2.1		0	390	2.1	2.1	147.2	
12/02/84	26,614	781	24.00	0.00	3.94	44	24	0	208	1,843		0.1	2.3		0	390	2.3	2.3	151.7	
12/03/84	26,668	782	28.00	0.00	3.94	52	28	0	208	1,899		0.0	2.1		0	390	2.1	2.1	155.9	
12/04/84	26,710	783	24.00	0.00	3.94	44	24	0	208	1,947		0.0	0.0		0	390	0.0	0.0	155.9	
12/05/84	26,722	783	8.00	0.00	3.95	12	8	0	208	1,963		1.0	18.0		0	390	18.0	18.0	191.6	
12/06/84	26,763	783	23.00	0.00	3.95	42	23	0	208	2,009		1.0	27.0		0	390	27.0	27.0	245.2	
12/07/84	26,819	784	30.00	0.00	3.95	56	30	0	208	2,069		0.0	5.0		0	390	5.0	5.0	255.1	
12/08/84	26,932	786	59.00	0.00	3.95	113	59	0	208	2,188		0.0	5.0		0	390	5.0	5.0	265.0	
12/09/84	26,999	787	38.00	0.00	3.96	67	38	0	208	2,257		0.1	3.8		0	390	3.8	3.8	272.5	
12/10/84	27,051	788	28.00	0.00	3.95	52	28	0	208	2,313		0.1	3.0		0	390	3.0	3.0	278.5	
12/11/84	27,107	789	30.00	0.00	3.96	56	30	0	208	2,373		2.0	0.0		0	390	0.0	0.0	278.5	
12/12/84	27,166	789	42.00	0.00	3.96	79	42	0	208	2,458		3.0	0.0		0	390	0.0	0.0	278.5	
12/13/84	27,259	791	38.00	0.00	3.96	73	38	0	208	2,533		0.0	3.0		0	390	3.0	3.0	284.4	

Table 5
Trinidad Reservoir - Stock Water Modeling During Non-irrigation Season
Water Year 1985
Reservoir Operations and River Gage Flows with Stock Water Releases Made at Alternative Rates

Date (Source/Note ->)/1	Allamata Stockwater Surface Acres		Inflow (cfs) (COE)	Release Rate 64.9 (cfs) /4, 16, /9	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) /5	Stock Water		Cumulative Total Inflow Stored (acre-feet) /6	Gage Flows		Flow Avail For Stockwater at Trinidad gage (cfs) /10	Cumulative Flow Avail For Stockwater Below Stockwater Diversion (acre-feet) /11	Flow Avail Below Stockwater Diversion (cfs) /11	Cumulative Flow Avail Below Stockwater Diversion (acre-feet) /11
	Content (acre-feet)	at Content (acres)						Released From Storage (cfs) /8, /9	Stock Water From Storage (acre-feet) /8		at Trinidad Dam w/ Allamata SW (cfs) (PURBTRCO)	at Trinidad Dam w/ Allamata SW (cfs) (PURTRICO)				
Total Days of Diversion/availability													9		130	
Totals (acre-feet)					571.83				704	7,888				1,199		791
Max Rates (cfs)													88		27	
Mean Rate when Diverting (cfs)													87		3	
12/14/84	27,313	792	29.00	0.00	3.96	54	29	0	208	2,591	0.1	2.3	0	390	2.3	289.0
12/15/84	27,372	794	32.00	0.00	3.96	60	32	0	208	2,654	0.1	2.5	0	390	2.5	294.0
12/16/84	27,418	795	25.00	0.00	3.96	46	25	0	208	2,704	0.1	2.5	0	390	2.5	298.9
12/17/84	27,432	795	9.00	0.00	3.97	14	9	0	208	2,722	0.1	2.3	0	390	2.3	303.5
12/18/84	27,485	796	29.00	0.00	3.98	54	29	0	208	2,780	0.1	2.8	0	390	2.8	309.0
12/19/84	27,545	797	32.00	0.00	3.98	60	32	0	208	2,843	0.1	2.5	0	390	2.5	314.0
12/20/84	27,614	799	37.00	0.00	3.98	69	37	0	208	2,916	0.1	2.5	0	390	2.5	318.9
12/21/84	27,644	800	17.00	0.00	3.97	30	17	0	208	2,950	0.1	2.3	0	390	2.3	323.5
12/22/84	27,666	800	13.00	0.00	3.98	22	13	0	208	2,976	0.1	1.9	0	390	1.9	327.3
12/23/84	27,727	801	33.00	0.00	3.98	61	33	0	208	3,041	0.1	2.3	0	390	2.3	331.8
12/24/84	27,766	802	21.00	0.00	3.98	38	21	0	208	3,083	0.1	1.9	0	390	1.9	335.6
12/25/84	27,827	803	33.00	0.00	3.98	61	33	0	208	3,148	0.1	2.5	0	390	2.5	340.8
12/26/84	27,902	805	40.00	0.00	3.98	75	40	0	208	3,227	0.1	3.0	0	390	3.0	346.5
12/27/84	27,987	808	45.00	0.00	3.98	85	45	0	208	3,318	0.1	2.6	0	390	2.6	351.5
12/28/84	28,073	808	45.00	0.00	3.98	85	45	0	208	3,405	0.1	2.5	0	390	2.5	356.4
12/29/84	28,134	810	33.00	0.00	3.98	61	33	0	208	3,470	0.0	2.5	0	390	2.5	361.4
12/30/84	28,180	811	25.00	0.00	3.97	46	25	0	208	3,520	0.0	2.3	0	390	2.3	366.0
12/31/84	28,241	812	33.00	0.00	3.98	61	33	0	208	3,585	0.0	2.8	0	390	2.8	371.6
01/01/85	28,281	813	21.00	0.00	1.98	40	21	0	208	3,627	0.0	1.9	0	390	1.9	375.3
01/02/85	28,297	814	8.00	0.00	0.00	18	8	0	208	3,643	0.0	2.5	0	390	2.5	380.2
01/03/85	28,313	814	8.00	0.00	0.00	18	8	0	208	3,659	0.0	3.0	0	390	3.0	385.2
01/04/85	28,380	814	24.00	0.00	0.00	48	24	0	208	3,707	0.0	3.0	0	390	3.0	392.1
01/05/85	28,424	815	32.00	0.00	0.00	63	32	0	208	3,770	0.0	2.6	0	390	2.6	397.1
01/06/85	28,479	816	28.00	0.00	0.00	56	28	0	208	3,826	0.0	2.3	0	390	2.3	401.7
01/07/85	28,543	817	32.00	0.00	0.00	63	32	0	208	3,889	0.0	2.5	0	390	2.5	406.8
01/08/85	28,622	818	40.00	0.00	0.00	79	40	0	208	3,968	0.0	2.5	0	390	2.5	411.6
01/09/85	28,678	820	28.00	0.00	0.00	56	28	0	208	4,024	0.0	1.9	0	390	1.9	415.3
01/10/85	28,709	821	16.00	0.00	0.00	32	16	0	208	4,058	0.0	2.3	0	390	2.3	418.9
01/11/85	28,749	821	20.00	0.00	0.00	40	20	0	208	4,096	0.0	2.3	0	390	2.3	424.5
01/12/85	28,773	822	12.00	0.00	0.00	24	12	0	208	4,120	0.0	2.8	0	390	2.8	430.0
01/13/85	28,828	823	28.00	0.00	0.00	56	28	0	208	4,176	0.0	2.8	0	390	2.8	435.6
01/14/85	28,878	824	24.00	0.00	0.00	48	24	0	208	4,224	0.0	2.5	0	390	2.5	440.5
01/15/85	28,795	824	24.00	64.90	0.00	-81	0	41	289	4,224	64.9	67.9	67.9	525	0.0	440.5
01/16/85	28,722	823	28.00	64.90	0.00	-73	0	37	362	4,224	64.9	67.9	67.9	660	0.0	440.5
01/17/85	28,641	822	24.00	64.90	0.00	-81	0	41	443	4,224	64.9	67.7	67.7	794	0.0	440.5
01/18/85	28,704	820	32.00	0.00	0.00	63	32	0	443	4,287	0.0	3.0	0	794	3.0	446.5
01/19/85	28,760	821	28.00	0.00	0.00	56	28	0	443	4,343	0.0	2.8	0	794	2.8	452.0
01/20/85	28,799	823	20.00	0.00	0.00	40	20	0	443	4,383	0.0	2.3	0	794	2.3	456.6
01/21/85	28,831	823	16.00	0.00	0.00	32	16	0	443	4,415	0.0	2.1	0	794	2.1	460.8
01/22/85	28,871	824	20.00	0.00	0.00	40	20	0	443	4,455	0.0	2.5	0	794	2.5	465.7
01/23/85	28,920	824	25.00	0.00	0.00	50	25	0	443	4,505	0.0	2.3	0	794	2.3	470.3
01/24/85	28,968	825	24.00	0.00	0.00	48	24	0	443	4,553	0.0	2.3	0	794	2.3	474.8
01/25/85	29,031	826	32.00	0.00	0.00	63	32	0	443	4,618	0.0	2.5	0	794	2.5	479.8
01/26/85	29,079	827	24.00	0.00	0.00	48	24	0	443	4,664	0.0	2.1	0	794	2.1	484.0

Table 5
Trinidad Reservoir - Stock Water Modeling During Non-Irrigation Season
Water Year 1985
Reservoir Operations and River Gage Flows with Stock Water Releases Made at Alternative Rates

Date [Source/Note ->] / /	Alternate Stockwater Content (acre-feet)	Surface Area at Content (acres)	Inflow (cfs) (COE)	Release Rate 64.9 (cfs) /4, /8, /9	Evap. (acre-feet)	Change in Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water		Cumulative Stock Water (acre-feet) /6	Gage Flows		Flow Avail. For Stockwater (cfs) /10	Cumulative Flow Avail. For Stockwater (acre-feet)	Flow Avail. Below Stockwater Diversions (cfs) /7	Cumulative Flow Avail. Below Stockwater Diversions (acre-feet) /7	
								Released (cfs) /8, /9	From Storage (acre-feet)		at Trinidad w/ Allamata SW (PURBTRCO) (cfs)	at Trinidad w/ Alternate SW (PURTRICO) (cfs)					
Total Days of Diversion/availability														9		130	
Totals (acre-feet)						571.83				704	7,888			68	1,199	27	791
Max Rates (cfs)														67		3	
Mean Rate when Diverting (cfs)																	
01/27/85	29,134	828	28.00	0.00	0.00	58	28	0	443	4,720	0.0	2.3	0	794	2.3	488.5	
01/28/85	29,184	829	25.00	0.00	0.00	50	25	0	443	4,770	0.0	1.9	0	794	1.9	492.3	
01/29/85	29,218	830	16.00	0.00	0.00	32	16	0	443	4,802	0.0	1.9	0	794	1.9	496.1	
01/30/85	29,232	830	8.00	0.00	0.00	16	8	0	443	4,818	0.0	1.5	0	794	1.5	499.0	
01/31/85	29,247	830	8.00	0.00	0.00	16	8	0	443	4,834	0.0	2.3	0	794	2.3	503.6	
02/01/85	29,255	831	4.00	0.00	0.00	8	4	0	443	4,842	0.0	4.0	0	794	4.0	511.5	
02/02/85	29,271	831	6.00	0.00	0.00	18	8	0	443	4,858	0.0	3.8	0	794	3.8	519.1	
02/03/85	29,329	831	29.00	0.00	0.00	58	29	0	443	4,916	0.0	4.0	0	794	4.0	527.0	
02/04/85	29,388	832	20.00	0.00	0.00	40	20	0	443	4,958	0.0	2.8	0	794	2.8	532.6	
02/05/85	29,400	833	18.00	0.00	0.00	32	18	0	443	4,988	0.0	3.0	0	794	3.0	538.5	
02/06/85	29,432	833	18.00	0.00	0.00	32	18	0	443	5,020	0.0	2.5	0	794	2.5	543.5	
02/07/85	29,464	834	18.00	0.00	0.00	32	18	0	443	5,052	0.0	2.3	0	794	2.3	548.0	
02/08/85	29,513	834	25.00	0.00	0.00	50	25	0	443	5,102	0.0	2.3	0	794	2.3	552.6	
02/09/85	29,555	835	21.00	0.00	0.00	42	21	0	443	5,144	0.0	0.0	0	794	0.0	552.6	
02/10/85	29,612	836	29.00	0.00	0.00	58	29	0	443	5,202	0.0	0.0	0	794	0.0	552.6	
02/11/85	29,652	837	20.00	0.00	0.00	40	20	0	443	5,242	0.0	2.3	0	794	2.3	557.2	
02/12/85	29,702	838	25.00	0.00	0.00	50	25	0	443	5,292	0.0	2.5	0	794	2.5	562.1	
02/13/85	29,775	838	37.00	0.00	0.00	73	37	0	443	5,385	0.0	2.5	0	794	2.5	567.1	
02/14/85	29,841	839	33.00	0.00	0.00	65	33	0	443	5,430	0.0	1.9	0	794	1.9	570.9	
02/15/85	29,914	840	37.00	0.00	0.00	73	37	0	443	5,503	0.0	1.7	0	794	1.7	574.2	
02/16/85	29,987	841	37.00	0.00	0.00	73	37	0	443	5,578	0.0	1.7	0	794	1.7	577.8	
02/17/85	30,045	842	29.00	0.00	0.00	58	29	0	443	5,634	0.0	1.3	0	794	1.3	580.2	
02/18/85	30,102	842	29.00	0.00	0.00	58	29	0	443	5,692	0.0	1.5	0	794	1.5	583.1	
02/19/85	30,160	843	29.00	0.00	0.00	58	29	0	443	5,750	0.0	1.3	0	794	1.3	585.7	
02/20/85	30,209	844	25.00	0.00	0.00	50	25	0	443	5,800	0.0	1.3	0	794	1.3	588.3	
02/21/85	30,267	844	29.00	0.00	0.00	58	29	0	443	5,858	0.0	1.5	0	794	1.5	591.3	
02/22/85	30,317	845	25.00	0.00	0.00	50	25	0	443	5,908	0.0	1.5	0	794	1.5	594.3	
02/23/85	30,390	845	37.00	0.00	0.00	73	37	0	443	5,981	0.0	1.9	0	794	1.9	598.0	
02/24/85	30,440	846	25.00	0.00	0.00	50	25	0	443	6,031	0.0	2.1	0	794	2.1	602.2	
02/25/85	30,505	847	33.00	0.00	0.00	65	33	0	443	6,096	0.0	1.9	0	794	1.9	606.0	
02/26/85	30,545	848	20.00	0.00	0.00	40	20	0	443	6,136	0.0	0.0	0	794	0.0	606.0	
02/27/85	30,592	848	24.00	0.00	0.00	48	24	0	443	6,184	1.0	0.0	0	794	0.0	608.0	
02/28/85	30,642	849	25.00	0.00	0.00	50	25	0	443	6,234	0.0	0.0	0	794	0.0	608.0	
03/01/85	30,583	849	25.00	64.90	0.00	-79	0	40	522	6,234	65.0	67.9	67.9	929	0.0	606.0	
03/02/85	30,478	848	21.00	64.90	0.00	-87	0	44	609	6,234	88.4	68.4	1,064	0.0	606.0		
03/03/85	30,381	847	17.00	64.90	0.00	-95	0	48	704	6,234	64.9	68.1	1,199	0.0	606.0		
03/04/85	30,422	846	22.00	0.00	1.98	42	22	0	704	6,278	0.1	2.8	0	1,199	2.8	611.5	
03/05/85	30,456	847	18.00	0.00	1.96	34	18	0	704	6,314	0.1	2.5	0	1,199	2.5	616.5	
03/06/85	30,508	847	26.00	0.00	1.96	50	26	0	704	6,368	0.0	2.8	0	1,199	2.8	622.0	
03/07/85	30,522	848	10.00	0.00	3.94	16	10	0	704	6,388	0.0	2.8	0	1,199	2.8	627.8	
03/08/85	30,555	848	20.00	0.00	5.90	34	20	0	704	6,428	0.0	2.5	0	1,199	2.5	632.5	
03/09/85	30,607	848	29.00	0.00	5.90	52	29	0	704	6,484	0.0	2.8	0	1,199	2.8	638.1	
03/10/85	30,649	849	25.00	0.00	7.86	42	25	0	704	6,534	0.0	3.2	0	1,199	3.2	644.4	
03/11/85	30,716	849	38.00	0.00	7.86	68	38	0	704	6,609	0.0	5.7	0	1,199	5.7	655.7	

Table 5
Trinidad Reservoir - Stock Water Modeling During Non-Irrigation Season
Water Year 1985
Reservoir Operations and River Gage Flows with Stock Water Releases Made at Alternative Rates

Date (Source/Note ->) /1	Altamata Stockwater		Inflow (cfs) (COE)	Release Rate		Evap. (acre-feet)	Change In Content (acre-feet)	Inflow Stored (cfs) /8	Stock Water			Gage Flows		Flow Avail For Stockwater at Trinidad (cfs) /10	Cumulative Flow Avail For Stockwater at Trinidad gage (acre-feet)	Flow Avail. Below Stockwater/ Diversions (cfs) /7	Cumulative Flow Avail. Below Stockwater/ Diversions (acre-feet) /7
	Content (acre-feet)	Surface Acres at Content (acres)		64.9 (ch) /4, /8, /9	Evap. (acre-feet)				Released From Storage (cfs) /8, /9	Cumulative Stock Water From Storage (acre-feet)	Cumulative Total Inflow Stored (acre-feet) /8	Bw Trinidad w/ Altamata SW (PURBTRCO) (cfs)	at Trinidad w/ Altamata SW (PURTRICO) (cfs)				
Total Days of Diversion/availability														9		130	
Totals (acre-feet)						571.83			704	7,888				88	1,199	27	791
Max Rates (cfs)														87		3	
Mean Rate when Diverting (cfs)																	
03/12/85	30,792	850	42.00	0.00	7.88	75	42	0	704	6,692		0.1	6.0	0	1,199	6.0	667.6
03/13/85	30,841	851	29.00	0.00	7.88	50	29	0	704	6,750		0.2	4.8	0	1,199	4.8	677.2
03/14/85	30,899	851	33.00	0.00	7.85	58	33	0	704	6,815		0.2	4.2	0	1,199	4.2	685.5
03/15/85	30,957	851	33.00	0.00	7.85	58	33	0	704	6,880		0.2	4.0	0	1,199	4.0	693.4
03/16/85	31,032	852	42.00	0.00	7.85	75	42	0	704	6,963		0.2	4.2	0	1,199	4.2	701.8
03/17/85	31,082	853	29.00	0.00	7.84	60	29	0	704	7,021		0.2	3.8	0	1,199	3.8	709.3
03/18/85	31,141	853	34.00	0.00	7.84	80	34	0	704	7,088		0.2	4.0	0	1,199	4.0	717.2
03/19/85	31,183	854	25.00	0.00	7.84	42	25	0	704	7,138		0.2	4.2	0	1,199	4.2	725.6
03/20/85	31,266	855	48.00	0.00	7.84	83	48	0	704	7,229		0.2	4.0	0	1,199	4.0	733.5
03/21/85	31,318	856	30.00	0.00	7.84	62	30	0	704	7,289		0.2	3.5	0	1,199	3.5	740.4
03/22/85	31,360	856	25.00	0.00	7.84	42	25	0	704	7,339		0.2	3.8	0	1,199	3.8	748.0
03/23/85	31,402	857	25.00	0.00	7.84	42	25	0	704	7,389		0.2	3.5	0	1,199	3.5	754.9
03/24/85	31,461	857	35.00	0.00	9.81	60	35	0	704	7,458		0.2	3.2	0	1,199	3.2	761.3
03/25/85	31,513	858	34.00	0.00	15.89	52	34	0	704	7,525		0.2	3.2	0	1,199	3.2	767.6
03/26/85	31,539	858	25.00	0.00	23.54	28	25	0	704	7,575		0.2	4.0	0	1,199	4.0	775.5
03/27/85	31,591	859	38.00	0.00	23.53	52	38	0	704	7,650		0.2	4.0	0	1,199	4.0	783.5
03/28/85	31,642	859	31.00	0.00	9.81	52	31	0	704	7,711		0.2	4.0	0	1,199	4.0	791.4
03/29/85	31,688	860	30.00	0.00	3.93	58	30	0	704	7,771		0.0	0.0	0	1,199	0.0	791.4
03/30/85	31,762	861	37.00	0.00	9.84	64	37	0	704	7,844		0.0	0.0	0	1,199	0.0	791.4
03/31/85	31,797	862	21.00	0.00	5.92	38	21	0	704	7,888		0.0	0.0	0	1,199	0.0	791.4

See list of footnotes on following page.

Trinidad Project
Modeling of Stock Water Alternatives
Eastern Colorado Area Office
Bureau of Reclamation
Nov-03

Footnotes to Tables 3, 4, 5

- /1 Columns not attributed are calculated.
- /2 Stockwater releases are assumed to have been available at the gages below the dam and at Trinidad
- /3 Stockwater was stored and then released at greater than 5 cfs rates until the 1993 season.
- /4 Consistent with historical practice, stockwatering assumed to be conducted between mid November (11/15) and mid March (3/15).
- /5 Stockwater releases made at a rate sufficient with stream gains to make 5 cfs available at the Trinidad gage but not to exceed the previous days inflow.
- /6 Stored inflow is not reduced for evaporation losses.
- /7 Flow not diverted for stockwater assumed available below diversions. Does not include gains.
- /8 Any releases made during the non irrigation season are considered releases for stockwatering.
- /9 Total releases from the reservoir for stockwater, when added to gains at the Trinidad gage, not to exceed 1200 acre-feet.
- /10 Flow considered available for stockwatering only when releases are being made from reservoir.

Table 6
Trinidad Project
Summary of Stock Water Alternatives Modeling Results
Modeled Stock Water Diversions

Water Year	Total Stock Water Diverted*		Total Days of Diversion		Maximum Rate of Diversion		Mean Rate when Diverting		Cummulative Stockwater Released from Storage	
	Current Stock Water (acre-feet)	Alternative Stock Water (acre-feet)	Current Stock Water (days)	Alternative Stock Water (days)	Current Stock Water (cfs)	Alternative Stock Water (cfs)	Current Stock Water (cfs)	Alternative Stock Water (cfs)	Current Stock Water (acre-feet)	Alternative Stock Water (acre-feet)
1985	1,190	1,199	120	9	5	68	5	67	0	704
1986	1,190	1,199	120	9	5	68	5	67	0	729
1994	1,190	1,199	120	9	5	68	5	67	0	673
1995	1,199	1,200	121	9	5	73	5	67	0	711
1996	1,200	1,199	121	9	5	68	5	67	0	702
1997	1,179	1,199	121	9	5	68	5	67	0	749
1998	1,200	1,200	121	9	5	68	5	67	0	561
1999	1,200	1,197	121	9	5	78	5	67	0	621
2000	1,200	1,197	121	9	5	68	5	67	0	543

* Values less than 1,200 acre-feet are due to rounding error except for 1997 Current Stock Water amount which was limited by the 120 day period of modeling assumed for stock water deliveries.

Table 7
Trinidad Project
Summary of Stock Water Alternatives Modeling Results
Total Non-Irrigation Season Reservoir Evaporation

Water Year	Current Stock Water (acre-feet)	Alternative Stock Water (acre-feet)	Diff b/w Current & Alt. (acre-feet)
1985	575	572	3
1986	487	484	3
1994	382	379	3
1995	431	426	5
1996	511	508	3
1997	315	313	2
1998	395	390	5
1999	537	532	5
2000	1,384	1,380	4

Table 8
Trinidad Project
Summary of Stock Water Alternatives Modeling Results
Gains from the Reservoir to the Trinidad Gage Available Below Stock Water Diversions*

Water Year	Total Days Available		Maximum Rate Available		Mean Rate when Available**		Total Gains Available Below Stock Water Diversions		
	Current Stock Water (days)	Alternative Stock Water (days)	Current Stock Water (cfs)	Alternative Stock Water (cfs)	Current Stock Water (cfs)	Alternative Stock Water (cfs)	Current Stock Water (acre-feet)	Alternative Stock Water (acre-feet)	Diff btw Current & Alt. (acre-feet)
1985	32	130	22	27	4	3	261	791	530
1986	28	130	5	10	2	2	149	487	338
1994	31	142	6	6	4	3	248	887	639
1995	33	137	8	13	3	2	188	555	369
1996	33	142	32	32	3	2	221	688	467
1997	33	138	4	9	2	1	153	399	246
1998	50	142	27	27	8	6	757	1,644	887
1999	61	136	21	22	9	6	1,085	1,600	515
2000	34	143	17	20	5	3	340	925	585

* Results presented here are based upon assumed rates and timing of stock watering for the modeling. (See discussion at IV Results in Report)

** While the Mean Rate of available gains under that Alternative Stock Water practice is less, it is available over more days under the Alternative practice and thus results in greater total gains available as indicated in the next set of columns.

APPENDIX B

Scoping Letter and Mailing List



IN REPLY
REFER TO:
EC-1340
PRJ-13.00

United States Department of the Interior

BUREAU OF RECLAMATION
Eastern Colorado Area Office
11056 West County RD 18E
Loveland, Colorado 80537-9711

JUL 21 2003

OFFICIAL USE ONLY

RECEIVED

JUL 24 03

REPLY DATE		
INFO. COPY TO:		
DATE	INITIAL	TO
7/24	98E	4200
CLASSIFICATION		
PROJECT		
CONTROL NO.		
FOLDER I D		

To: Interested Agencies and Members of the Public

Subject: Trinidad Dam and Reservoir Project

The Bureau of Reclamation (Reclamation) requests your input regarding a proposal to amend the existing Operating Principles and Operating Criteria for the Trinidad Dam and Reservoir Project (See enclosed map). The proposed changes would:

- Provide for the City of Trinidad's (City) use of a portion of the irrigation capacity for municipal and industrial (M&I) purposes.
- Allow the Colorado State Parks to utilize 700 acre-feet (af) of the irrigation capacity to replace evaporation and seepage losses to the recreation pool
- Allow more effective delivery of stock watering during the non-irrigation season by allowing the stock water to be stored temporarily and then released at higher rates than the 5 cubic feet/second (cfs) rate presently allowed

Public input will assist Reclamation in determining environmental issues and a range of alternatives related to the proposed action. This information will be incorporated into an environmental assessment (EA), which will be prepared in accordance with the National Environmental Policy Act of 1969 (NEPA).

Purpose & Need:

The purpose and need for each element of the proposed action is presented below:

- The City has insufficient water to meet their current and future water needs. In an effort to meet their needs, the City has purchased water rights from irrigators that store water in the irrigation capacity at Trinidad Reservoir. However, the current Operating Criteria only allow water stored in the irrigation capacity to be delivered to the irrigable lands in the Purgatoire River Water Conservancy District (District), and not for M&I purposes. Implementing the 1997 Operating Principles through amendment of the Operating Criteria will allow water in the irrigation capacity to be used for M&I purposes would allow the City to address their water supply needs.

- Trinidad Reservoir is subject to a great deal of fluctuation of both the water storage and water surface elevation. This is undesirable for management of the recreation facilities, recreation experience, and for optimizing the health and success of the fishery. Stabilizing water levels and keeping them higher during the recreation season by offsetting losses to the recreation pool would improve recreation experience, recreation access, and the fishery. The current Operating Principles and Operating Criteria do not provide this.
- Currently, the Operating Principles allow daily releases for non-irrigation season stock watering within the District, however the rate of releases cannot exceed 5 cfs. This release rate has proven to be an impractical method for delivering the stock water to stock ponds along the ditches. At the rate of 5 cfs, transit and evaporative losses along the ditches often do not allow water to reach the stock ponds. Allowing stock water to be stored for short periods during the non-irrigation season, and then releasing the water at a higher rate will allow water to reach stock water ponds that under the current rate do not receive water.

Reclamation's execution of the Operating Principles and Operating Criteria is a Federal action that requires compliance with NEPA. Reclamation will be the lead Federal agency. The U.S. Army Corps of Engineers, Albuquerque District, owner and operator of Trinidad Dam and Reservoir Project, will be acting as a cooperating agency. Reclamation anticipates the preparation of an EA to evaluate the environmental consequences of the proposed action and determine whether there is a need to prepare an Environmental Impact Statement. The appropriate environmental documents will support Reclamation's final decision.

Potential Environmental Issues and Concerns:

Reclamation has tentatively identified the following issues or potential resource impacts that could result from the proposed action.

1. Impacts from changes in the hydrology of the Purgatoire River and its tributaries downstream of Trinidad Reservoir, and the Arkansas River between its confluence with the Purgatoire River and John Martin Reservoir.
 2. Impacts on federally-listed threatened, endangered, and candidate species.
 3. Impacts from the retirement of irrigated farmland from production.
 4. Impacts from changes in Trinidad Reservoir storage.
-

Alternatives:

Reclamation will consider environmental issues identified to develop appropriate mitigation measures and alternatives. Preliminary alternatives that have been developed for initial consideration include:

1. *No Action Alternative:* Reclamation would not execute the proposed amended Operating Principles and Operating Criteria, and would continue to operate under the existing Operating Principles and Operating Criteria.
2. *Proposed Action Alternative:* Reclamation would execute the amended Operating Principles and Operating Criteria to:
 - Allow the City of Trinidad (City) to use of a portion of the irrigation capacity for municipal and industrial (M&I) purposes
 - Allow the Colorado State Parks to utilize 700 acre-feet (af) of the irrigation capacity for the recreation pool, primarily to replace evaporation and seepage losses
 - Allow more effective delivery of stock watering during the non-irrigation season by allowing the stock water to be stored and released at higher rates than the 5 cubic feet/second (cfs) rate presently allowed

Timeframe for Receiving Comments

Again, the purpose of this document is to solicit initial public and agency comments on environmental issues and potential effects that should be considered by Reclamation. If upon review of this information you desire to provide written comments or have any questions, please send your comments by August 11, 2003, to: Bureau of Reclamation, Great Plains Regional Office, Attn: D. Epperly (GP-4200), P.O. Box 36900, Billings, MT 59104 or Fax 406-247-7680.

Sincerely,

Brian Person
Brian Person
Area Manager

Enclosure

bc: GP- 4200 (Doug Epperly)
EC-1003 (Vehmas), EC-1300 (Johns), EC-1340 (Wilson, Sunde)

NOTICE:
IF YOU DETACH ENCLOSURES, PLEASE
INSERT YOUR CODE NUMBER _____

Appendix B

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Eugene Aiello
President
Purgatoire River Water Conservancy District
314 West Main Street
Trinidad CO 81082
Work Phone: 719-846-7285
Fax Number: 719-846-6941
Email address: prwcd@yahoo.com

Ms. Jan Anderson
Recording Secretary
Arkansas River Compact Administration
112 W. Elm Street
P.O. Box 1600
Lamar CO 81052
Work Phone: 719-336-2732
Fax Number: 719-336-3835
Email address: secdec@secdec.net

Ms. Carol Angel Esq.
First Ass't. Attorney General
Attorney General's Office
1525 Sherman St., 5th Floor
Denver CO 80203
Work Phone: 303-866-5016
Fax Number: 303-866-3558
Email address: carol.angel@state.co.us

Mr. Dale Book
Spronk Water Engineers Inc.
1000 Logan Street
Denver CO 80203-3011
Work Phone: 303-861-9700
Fax Number: 303-861-9799
Email address: dbook@spronkwater.com

Mr. David Brenn
1710 Pheasant Court
Garden City KS 67846
Work Phone: 620-275-7460
Fax Number: 620-260-9605
Email address: dbrenn@gcnet.com

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Jeris Danielson Ph.D., P.E.

President

Danielson & Associates

517 Belleview Ave

Work Phone: 719-383-2598

Fax Number: 719-384-9528

La Junta CO 81050

Email address: prwcd@yahoo.com

Mr. John Draper

Montgomery & Andrews

P.O. Box 2307

Work Phone: 505-982-3873

325 Paseo De Peralta

Fax Number: 505-982-4289

Santa Fe NM 87504-2307

Email address: jdraper@montand.com

Mr. James Fernandez

Utilities Director

City of Trinidad

135 North Animas

Work Phone: 719-846-2266

Fax Number: 719-846-4140

Trinidad CO 81082

Email address: linda@historict Trinidad.com

Mr. Dennis Garcia

Reservoir Control

Albuquerque Dist. U.S. Army Corps of Engineers

Albuquerque District

Work Phone: 505-342-3380

4101 Jefferson Plaza, NE

Fax Number: 505-342-3197

Albuquerque NM 87109-3435

Email address: dennis.e.garcia@usace.army.mil

Mr. Randy Hayzlett

Route 1, Box 44

Work Phone: 620-355-7499

Fax Number: 620-355-7499

Lakin KS 67860

Email address: hayzlett@pld.com

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Jeffrey Kahn Esq.

Attorney

Bernard, Lyons & Gaddis, PC

515 Kimbark Street

P.O. Box 978

Longmont

CO 80502-0978

Work Phone: 303-776-9900

Fax Number: 303-413-1003

Email address: jkahn@biglaw.com

Mr. Dick Kreiner

Reservoir Control

U.S. Army Corps of Engineers

Albuquerque District

4101 Jefferson Plaza, NE

Albuquerque

NM 87109

Work Phone: 505-342-3383

Fax Number: 505-342-3195

Email address: richard.d.kreiner@usace.army.mil

Mr Bruce Kroeker P.E.

President

TZA Water Engineers, Inc.

9200 W. Cross Drive Suite 250

Littleton

CO 80123

Work Phone: 303-971-0030

Fax Number: 303-971-0077

Email address: bkroeker@tza4water.com

Mr. Rod Kuharich

Director

Colorado Water Conservation Board

721 State Centennial Building

1313 Sherman Street

Denver

CO 80203

Work Phone: 303-866-3441

Fax Number: 303-866-4474

Email address: rod.kuharich@state.co.us

Mr. John Lefferdink Esq.

Attorney at Law

Lefferdink Law Office, LLC

409 South Main

P.O. Box 110

Lamar

CO 81052

Work Phone: 719-336-7411

Fax Number: 719-336-7621

Email address: lefflaw@centurytel.net

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mrs. Thelma Lujan

Secretary

Purgatoire River Water Conservancy District

314 West Main Street

Work Phone: 719-846-7285

Fax Number: 719-846-6941

Trinidad CO 81082

Email address: prwcd@yahoo.com

Mr. Steve Miller

Colorado Water Conservation Board

Work Phone: 303-866-3532

1313 Sherman Street Room 721

Fax Number: 303-866-4474

Denver CO 80203-2239

Email address: steve.miller@state.co.us

Mr. Donald Pitts

Assistant Attorney General

Office of the Attorney General

Kansas Judicial Center, 2nd Floor

Work Phone: 785-296-2215

301 SW 10th Street

Fax Number: 785-296-6296

Topeka KS 66612-1597

Email address: pittsd@01po.wpo.state.ks.us

Mr. Thomas Pointon

34805 Road 17

Work Phone: 719-456-0413

Fax Number: 719-456-1609

Las Animas CO 81054

Email address: tomw7@centurytel.net

Mr. David Pope P.E.

Chief Engineer-Director

Kansas Department of Agriculture

Division of Water Resources

Work Phone: 785-296-3717

109 S.W. 9th Street, 2nd Floor

Fax Number: 785-296-1176

Topeka KS 66612-1283

Email address: dpope@kda.state.ks.us

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Kevin Pratt
Attorney

480 Holly Sugar Bldg
2 N Cascade Ave
Colorado Springs CO 80903-1623

Work Phone:
Fax Number:
Email address:

Mr. James Rogers

32259 County Road 13 (Route 2)
Lamar CO 81052

Work Phone: 719-336-2124
Fax Number: 719-336-2422
Email address: rogerscountry@cmlinet.net

Mr. Lee Rolfs
Attorney

Kansas Department of Agriculture
Kansas Division of Water Resources
109 SW 9th Street, 4th Floor
Topeka KS 66612

Work Phone: 785-296-4616
Fax Number: 785-368-6668
Email address: lrolfs@kda.state.ks.us

Mr. Mark Rude

Assistant Operations Secretary
Water Commissioner, Garden City Field Office
Division of Water Resources
2508 Johns Street
Garden City KS 67846

Work Phone: 620-276-2901
Fax Number: 620-276-9315
Email address: mrude@kda.state.ks.us

Mr. Hal Simpson
State Engineer

CO Division of Water Resources
818 State Centennial Bldg
1313 Sherman Street
Denver CO 80203-2277

Work Phone: 303-866-3581
Fax Number: 303-866-3589
Email address: hal.simpson@state.co.us

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Tom Simpson

City of Aurora

Water Resources Department

17850 Road JJ

Rocky Ford CO 81067

Work Phone: 719-254-7984

Fax Number: 719-254-7986

Email address: tsimpson@rural-com.com

Ms. Beverly Spady

Spady Consulting

420 Vigil St.

Las Animas CO 81054

Work Phone: 719-456-1899

Fax Number: 719-456-1899

Email address: b_spady@yahoo.com

Mr. Mark Stark

Operations Manager

U.S. Army Corps of Engineers

John Martin Reservoir

29955 County Road 25.75

Hasty CO 81044

Work Phone: 719-336-3476

Fax Number: 719-336-9711

Email address: mark.m.stark@usace.army.mil

Mr. Donald Steerman Esq.

Attorney at Law

Shinn, Steerman & Shinn

P.O. Box 390

Lamar CO 81052

Work Phone: 719-336-4313

Fax Number: 719-336-4315

Email address: shinnsteermanlaw@centurytel.net

Mr. Tom Tefertiller

Oxley Farms

Model CO 81059

Work Phone:

Fax Number:

Email address:

Trinidad Operating Principles Interested Parties List

Revised: 27-Sep-04

Mr. Tom Tifertill

Model Land Irrigation Company

P.O. Box 57

Work Phone: 719-846-6745

Fax Number:

Model CO 81059

Email address: oxleymgr@hotmail.com

Mr. Robert Trout Esq.

Trout and Witmer and Freeman , P.C.

1120 Lincoln Street Suite 1600

Work Phone: 303-861-1963

Fax Number: 303-832-4465

Denver CO 80203

Email address: rtrout@troutlaw.com

Mr. Steven Witte

Operations Secretary, Division 2 Engineer

Colorado Division of Water Resources

310 East Abriendo, Suite B

Work Phone: 719-542-3368

Fax Number: 719-544-0800

Pueblo CO 81004

Email address: steve.witte@state.co.us

Ms. Julianne Woldridge Esq.

MacDougall Law Office

530 Communications Circle Suite 204

Work Phone: 719-520-9288

Fax Number: 719-520-9447

Colorado Springs CO 80905

Email address: jwoldridge@waterlaw.tv

APPENDIX C

Comment Letters



OFFICIAL FILE COPY RECEIVED		
AUG 13 03		
REPLY DATE		
INFO. COPY TO:		
DATE	INITIAL	TO
8/14	DE	YACC
KATHLEEN SEBELIUS, GOVERNOR		
CLASSIFICATION		
PROJECT		
CONTROL NO.		
FOLDER NO.		

DEPARTMENT OF AGRICULTURE
ADRIAN J. POLANSKY, SECRETARY

August 11, 2003
VIA FAX

Attn: D. Epperly (GP-4200)
Great Plains Regional Office
Bureau of Reclamation
PO Box 36900
Billings, MT 59104

RE: Trinidad Dam and Reservoir Project
NEPA Notice dated July 21, 2003

Dear Mr. Epperly:

The State of Kansas has been, and will continue to be, actively involved in the three issues listed in this notice. Kansas is a signatory to the Trinidad Operating Principles (referred to as *Principles*).

The Principles were amended to allow the City of Trinidad to transfer water from irrigation to municipal and industrial (M&I) use. The State of Kansas agreed to this transfer with the understanding that consumptive use would not be increased over the historical use made of this water. Kansas has expressed concerns that at least one tract of dry-up land did not appear to have been irrigated in many years. Appropriate lands should be dried up and associated return flows protected to their historic point of return on the Purgatoire River so the transfer has no significant effect on downstream water users.

The proposal to convert additional irrigation water supply to make up for evaporation and seepage from the permanent fishery pool must be done in a way which does not impact downstream water supply by limiting use under the transfer to the historic consumptive use. The State of Kansas had the opportunity to review the lands proposed for dry-up. Kansas expressed concerns to a representative of the Model Land & Irrigation Company about two of these proposed dry-up tracts. The Model Land and Irrigation Company should substitute other tracts. Return flows associated with this transfer should be protected to their historic point of return on the Purgatoire River so that downstream users are not affected.

Division of Water Resources David L. Pope, Chief Engineer
109 SW 9th St., 2nd Floor Topeka, KS 66612-1283
Voice (785) 296-3717 Fax (785) 296-1176 <http://www.accesskansas.org/ldo>

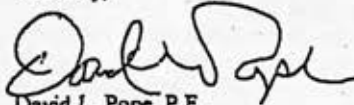
D. Epperly (GP-4200)
Great Plains Regional Office
Page 2
August 11, 2003

If an alternative is identified which provides for more efficient deliveries of stockwater, this must be done without increasing depletions. This issue was considered at the CY2002 Arkansas River Compact Administration Annual Meeting in May 2003. A proposal made during the meeting by the Purgatoire District varied significantly from previous proposals related to stockwater deliveries. At that time, there was not sufficient time for the other parties to compare the proposal to either the current or the temporary stockwater amendments. Any depletions due to an alternative stockwater release should be compared to the depletions under the stockwater release as prescribed by the Principles. Under the current Principles, inflow may be passed through for stockwatering (not to exceed a daily mean flow of 5 cfs), otherwise inflows are stored under the transferred Model storage right. If temporary stockwater storage were allowed, it should be done within the Model storage right. The combined storage for all uses of the Model storage right should be limited to 20,000 acre feet.

The transfer of water to Colorado State Parks for evaporation and seepage, and changes to stockwater operations must not be implemented until such time as the amendments to the Principles are approved by the signatory parties.

We appreciate the opportunity to be able to comment in the NEPA process. We would like to continue to be involved. Should you have any questions, please feel free to call this office.

Sincerely,



David L. Pope, P.E.
Chief Engineer

DLP/kis/dlm

c: Brian Person, USBR
Randy Hayzlett, KS ARCA Rep
David Brenn, KS ARCA Rep

MacDOUGALL, WOLDRIDGE & WORLEY, P.C.
530 Communication Circle, #204
Colorado Springs, CO 80905-1743

M.E. MacDougall
Julianne M. Woldridge
Henry D. Worley

jwoldridge@waterlaw.tv

August 11, 2003

14

OFFICIAL FILE COPY RECEIVED		
AUG 14 '03		
REPLY DATE		
INFO. COPY TO:		
DATE	INITIAL	TO
8/14	SE	YJG
Telephone		
(719) 534-0288		
FAX		
CLASSIFICA (204) 520-9947		
PROJECT		
SERIAL NO.		
100		

Bureau of Reclamation
Great Plains Regional Office
Attn: D. Epperly (GP-4200)
P.O. Box 26900
Billings, MT 59104

Re: Trinidad Dam and Reservoir Project

To Whom It May Concern:

This office represents the Purgatoire River Water Conservancy District, a water conservancy district formed under the laws of the State of Colorado ("PRWCD"). PRWCD operates the irrigation portion of the Trinidad Dam and Reservoir Project, pursuant to a contract with the United States. On behalf of PRWCD, I am providing the following comments on the proposals to amend the existing Operating Principles and Operating Criteria for the Project:

1. The proposed amendments to the operation of the Irrigation Capacity of the Reservoir do not involve any physical change to the reservoir itself. The physical capacity of the reservoir will not be altered, and no physical work or construction on site will be necessary to implement the amendments. The amendments for the City of Trinidad and the State Parks involve changes in the types of uses for water that has always been part of the District's Water Supply, as defined by the Initial Operating Principles. As such, the only operating changes will be administrative. There is no increase in the amount of water to be stored, or used, only a change in type of use. The amendment regarding stock water will involve storage of additional small amounts of water, but it is water that historically has passed through the Project anyway, and that can be stored in currently available capacity within the reservoir.

2. The amendments may cause a difference in timing as to when such water will be released for use, but releases from the reservoir for the new uses or for stock watering do not require a change in the time of year during which PRWCD is currently allowed to administer such Water Supplies, as defined by the initial Operating Principles.

3. The City of Trinidad and State Parks amendments have or will be allowed

2954-2L j:PRWCD\8-11-03 Bureau

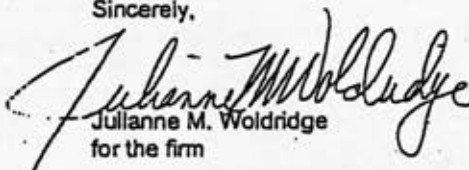
only pursuant to a change of water rights approved by the Colorado Water Court. As part of this process, the historic consumptive use of the subject water has or will be determined and future use of the water will be limited to that historic consumptive use. Thus, to a great extent, the affect on the hydrology of these rivers has or will be determined in the Water Court process. This process is designed to prevent expanded consumptive use of the water and to prevent adverse affects on the water right administration on the Purgatoire River or the Arkansas River, or on other water rights. The Water Court process, however, does not involve issues of environmental impacts.

4. The amendment regarding stock water does not require a Water Court change of water rights. The water will continue to enter the Project at the same time and in the same amount as it has historically, and will pass through Project facilities within the same time period as it has historically. The total amount of such water passing through the Project will not change. Thus, there should be no measurable affect on the hydrology or environment of the river below the Project.

5. PRWCD does not believe there will be any adverse impacts from changes in Trinidad Reservoir storage. As noted above, there is no change in the total amount of water available to the Irrigation Capacity and managed by the District as a result of any of these amendments, the only change is in how such water is used and in the timing of the use. The additional water that may be stored as a result of the stock water amendment is minimal, can be stored within existing physical capacity, and should have no measurable affect on the operations of the Project or its effects on the environment. In fact, the amendments regarding the City of Trinidad have been implemented for several years now with no noticeable adverse impact on the environment or the Project operations.

PRWCD recommends that the Bureau adopt Proposed Action Alternative number 2, approving the changes to the Operating Principles and Operating Criteria. PRWCD is willing to provide copies of any documentation that may be helpful in this effort. Please contact the District if you desire any such documentation.

Sincerely,


Julianne M. Woldridge
for the firm

JMW

cc: PRWCD
Robert Trout
Jeff Kahn

15

OFFICIAL FILE COPY
RECEIVED

AUG 14 03

DATE _____

BY _____

TO _____

PROJECT _____

CLASSIFICATION _____

CONTROLLER/ENGINEER _____

DIVISION ENGINEER _____

STATE OF COLORADO

WATER DIVISION 2
OFFICE OF THE STATE ENGINEER
310 East Nicholas Ave., Suite B
Pueblo, CO 81004
Phone (719) 543-1343
FAX (719) 544-0802

August 5, 2003

Bureau of Reclamation
Great Plains Regional Office
P.O. Box 36900
Billings, MT 59104

Attn: D. Epperly (GP-4200)

RE: Trinidad Dam and Reservoir Project
Environmental Assessment Comments

To Whom It May Concern:

In response to your request for initial public and agency comments on the above referenced project, the Colorado Division of Water Resources, Division 2 office offers the following:

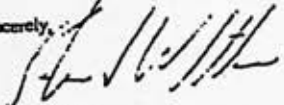
1. City of Trinidad's use of a portion of the irrigation capacity for M&I purposes.

The requested change in the Operating Criteria is consistent with the 1997 Amended Operating Principles - Article IV(B)(3) and the decree entered in Case No. S8CW061.
2. Colorado State Parks use of 700 acre-feet of irrigation capacity.

As noted, the requested change requires amendment of the Operating Principles and Operating Criteria. Additionally, water court approval to change the irrigation water right to a fully consumptive use without injuring Colorado water rights is required.
3. Delivery of stock water during the non-irrigation season.

As noted, the requested change requires amendment of the Operating Principles. During the non-irrigation season, all inflows are stored in the reservoir except for M&I purposes, winter return flow requirements and stock water needs. The ability to temporarily store stock water allowances for subsequent release at a higher rate of flow (to be determined and with volumetric limits) will benefit the project with negligible effects downstream.

Thank you for the opportunity to provide initial comments. Please keep us advised as the process develops.

Sincerely,

Steven J. Witte
Division Engineer

RECLAMATION

Managing Water in the West

Trinidad Dam and Reservoir Project Operating Principles and Operating Criteria Amendment

Finding Of No Significant Impact



U.S. Department of the Interior
Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

November 2004

INTRODUCTION

This Finding of No Significant Impact (FONSI) describes the Bureau of Reclamation's (Reclamation) environmental conclusions regarding a proposal to amend the Operating Principles and Operating Criteria for the Trinidad Dam and Reservoir Project to allow delivery of water for municipal and industrial (M&I) purposes, allow use of a portion of the irrigation capacity to replace evaporation and seepage losses of the recreation pool, and improve the effectiveness of stockwater deliveries.

Environmental effects of the Operating Principles and Operating Criteria Amendment Alternative (Amendment Alternative) and the No Action Alternative were evaluated under the provisions of the National Environmental Policy Act (NEPA), and are documented in the attached Environmental Assessment (EA).

Purpose and Need

The purpose of changing the Operating Criteria to include M&I uses is to allow the City of Trinidad (City) to utilize water rights that they have acquired to meet their water needs. The City has purchased water rights from irrigators who store water in the irrigation capacity at Trinidad Reservoir. The City operates its changed water rights in accordance with State law and the Operating Principles. However, the current Operating Criteria only addresses use of the irrigation capacity for irrigation purposes, and not for M&I purposes. The City is currently using some of its changed water rights for augmentation of city wells and has determined that their population growth may necessitate use of more of their water as early as 2005. The Operating Criteria need to be amended to be consistent with the changed water rights and amended Operating Principles. This will facilitate the City's ability to address their needs.

The purpose of amending the Operating Principles for the Trinidad Dam and Reservoir Project (Operating Principles) and the Operating Criteria to allow the irrigation capacity to be used to replace the recreation pool's evaporation and seepage losses is to improve recreational experience at the reservoir. The surface water elevation of Trinidad Reservoir is subject to a great deal of fluctuation. This is undesirable for management of the recreation facilities, recreation experience, and for optimizing the health and success of the fishery. Stabilizing water levels and keeping them higher during the recreation season by having an annual supply of water to replenish recreation pool evaporation and seepage losses would improve the recreation experience, recreation access, and the fishery.

The purpose of changing how stock water releases are managed is to make more effective stock water deliveries. The current Operating Principles allow releases for non-irrigation season stock watering within the Purgatoire River Water Conservancy District (District), however these releases cannot exceed 5 cubic feet per second (cfs). This has proven to be an impractical method for delivering the stock water. Because these releases occur outside of the irrigation season (October - March), there are typically very few if any releases for other purposes being made at the same time as these stock water releases. Consequently, the transit losses and evaporation of these releases are high, and very little, if any, of the releases reach the stock water ponds. Allowing stock water to be stored for periods during the non-irrigation season, and then releasing the water at a higher rate (> 5 cfs) will increase the amount of water that reaches the stock water ponds.

During the environmental review process, potential effects from the Proposed Action were identified, either by the public, other agencies, or Reclamation staff. Reclamation used potential effects to help focus the environmental review process, to structure the EA, and to identify opportunities for mitigating or avoiding adverse effects of the Proposed Action.

PREFERRED ALTERNATIVE

Reclamation evaluated the effects of two alternatives—the No Action Alternative and the Amendment Alternative. Reclamation has selected the Amendment Alternative as the Preferred Alternative. This alternative entails approval of amendments to the existing Operating Principles adopted by the Arkansas River Compact Administration (ARCA) in May and December 2003, and approval of amendments to the Operating Criteria to implement 1998 and 2003-proposed amendments of the Operating Principles. The proposed amendments would:

- Allow the City to use a portion of the irrigation capacity for M&I purposes (through approval of proposed amendments to the Operating Criteria; amendments to Operating Principles to allow for this were approved in 1998)
- Allow the State of Colorado Division of Parks and Outdoor Recreation (State) to utilize 700 acre-feet (af) of the irrigation capacity to replace evaporation and seepage losses of the recreation pool (a.k.a. permanent fishery pool) (through approval of amendments to the Operating Principles adopted by ARCA in May and December 2003 and amendments to the Operating Criteria)
- Allow more effective delivery of stock watering during the non-irrigation season by allowing stock water to be stored in Trinidad Reservoir and released at higher rates than the 5 cfs rate presently allowed (through approval of amendments to the Operating Principles adopted by ARCA in May and December 2003).

FINDING

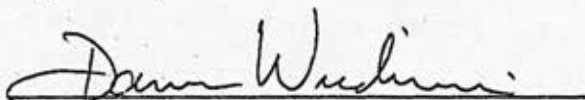
Having evaluated potential significant impacts associated with the Preferred Alternative, Reclamation has determined that no significant impacts are anticipated to occur. Furthermore, Reclamation makes the following specific findings:

- No significant adverse impacts to hydrology are expected as a result of the Preferred Alternative, based on the following:
 - Trinidad Reservoir. Reservoir elevations are generally expected to be higher and remain higher during the irrigation season and will not be noticeably different during the non-irrigation season when compared to historic or no action conditions.
 - Purgatoire River. No impacts to the Purgatoire River downstream of the Hoehne headgate will occur. Upstream of the Hoehne headgate, minor decreases in average flow are expected during the irrigation season, and minor increases in average flow are expected during the non-irrigation season. In addition, changes in stockwater deliveries will result in higher but minor, short duration (6-9 days) non-irrigation season flows between the dam and District headgates.
 - Arkansas River. The Arkansas River will not be impacted.
- No significant adverse impacts to prime farmlands are expected as a result of the Preferred Alternative. The effected lands can still be used for agricultural or ranch purposes, but irrigation water can no longer be delivered to them.
- The Preferred Alternative will not result in a material depletion at the state line, and consequently will not impact the Arkansas River Compact.

- Analysis determined that the Preferred Alternative would have no affect on piping plover, interior least tern, black-footed ferrets, Arkansas darter, and lesser-prairie chickens. Bald eagles may be affected, but any effects will be minor and are anticipated to be beneficial due to improved winter forage habitat.
- The majority of State of Colorado species of concern within the action area will not be impacted. Some water-related species, such as the plains minnow, suckermouth minnow, flathead chub, yellow mud turtle, and the northern river otter, may experience very minor, insignificant negative and/or beneficial impacts due to river flow and reservoir storage changes.
- The Preferred Alternative would result in higher and more stable average minimum reservoir levels throughout the year, including during historically low reservoir volume periods such as late summer and fall. This would benefit recreation at the reservoir.
- The Preferred Alternative will result in the City having sufficient water resources for growth through 2020 and beyond, therefore no socioeconomic impacts are anticipated.
- The Preferred Alternative is expected to result in hydrologic changes that are within the range of historic storage and flow levels. Consequently, this is not the type of undertaking that would have an effect on cultural resources.
- The Preferred Alternative will have no effects on Indian trust assets or Indian sacred sites.

This Finding of No Significant Impact has therefore been prepared and is submitted to document environmental review and evaluation of the Proposed Action in compliance with the National Environmental Policy Act of 1969, as amended.

Approved By:



Area Manager
Eastern Colorado Area Office

11/12/04
Date

APPENDIX H
SUMMARY OF COMMENTS ON THE DRAFT EA

Number	Comment	Agency	Reclamation Response
1	Page 7, Introduction- The second paragraph is confusing, as three (3) documents are listed (PRWCD's repayment contract, Operating Principles, and Operating Criteria). Also, the specific amendments in these three separate documents are not delineated. The proposed amendments for each of these documents should be described separately for clarity. As far as the construction of this sentence, amendments to the Operating Principles and Operating Criteria is referred to in two (2) separate locations.	Kansas Division of Water Resources	The paragraph was rewritten as follows: Reclamation's approval of these proposed amendments are all federal actions subject to provision of the National Environmental Policy Act (NEPA) of 1969. The amendments would: 1) Extend the contract repayment period; 2) Amend the method of calculating PRWCD's repayment contract amount 3) Update standard contract articles pursuant to Reclamation policy; 4) Approve amendments to both the Operating Principles and Operating Criteria, which are also included as exhibits attached to PRWCD repayment contract.
2	Page 7, Purpose and Need- add "and Colorado Parks and Wildlife" after "reflect repayment obligations based on the City of Trinidad (Trinidad) that does not go through the head gates.	City of Trinidad	Appendix G- 2004 Environmental Assessment was added to provide additional context. The Proposed Action was updated to separate Reclamation's actions into three general categories: 1) amend the repayment contract, 2) approve amendments to the Operating Criteria, and 3) approve amendments to the Operating Criteria.
3	Page 7, Purpose and Need- Additional context is needed to speak to past changes in water rights similar to those addressed through the current Operating Principles amendments. CDNR requests that the Purpose and Need section of the EA include a statement acknowledging that Colorado Parks and Wildlife has already obtained a change in water rights from irrigation to storage in the permanent pool.	CDNR	See Comment above. Also, all changes in water rights uses in Colorado are adjudicated through Colorado State Water Court and administered by the Colorado Division of Water Resources.
4	Page 7, Purpose and Need- Insert "replication of" in front of "historic return flows..." In the last sentence.	PRWCD	Change was incorporate into the Final EA.
5	Page 7, Purpose and Need- The Proposed Action is to amend the repayment contract, however a list of proposed actions is identified later in the document. The first paragraph lists two (2) items that do not necessarily relate directly to the repayment contract. As I understand the Operating Principles and Operating Criteria are exhibits to the PRWCD's repayment contract and are separate documents which have proposed amendments that could should be evaluated in the EA.	Kansas Division of Water Resources	This section was rewritten to address the commenter's concerns. There are three actions Reclamation is considering in the EA: 1) Amending the Repayment Contract, 2) Approving amendments to the Operating Principles; and 3) Approving Amendments to the Operating Criteria. Please see the Proposed Action and Appendices for additional detail.
6	Page 7, Purpose and Need- Item 2) from comment above, notes an update (emphasis added) that would allow the conversion of project water from irrigation to M&I purposes. This is actually the subject of an amendment to the Operating Principles proposed by PRWCD for the City of Trinidad. My understanding of this EA, the focus is to determine the impacts of such an amendment. I would note that this is similar to the November 2004 EA. The November 2004 EA was completed for three changes to the Trinidad Operating Principles: Trinidad conversion of irrigation water rights to M&I; Colorado State Parks conversion of irrigation water rights to replace evaporation and seepage associated with recreation pool; and Changes to how stock water releases are made. A link should be provided to the 2004 EA done on the previous amendments since it is referred to often.	Kansas Division of Water Resources	The commenter is correct and the primarily analysis of this EA focuses on the environmental effects of the proposed amendment to the Operating Principles. The 2004 EA was incorporated by reference and the Finding of No Significant Impact signed by Reclamation was included in the Draft EA as Appendix E. A copy of the 2004 Final EA has been added to Appendix G for ease of reference.

Number	Comment	Agency	Reclamation Response
7	Page 7, Purpose and Need -The second misstatement of Item 2 above is the need of additional water to "meet its current and future needs". This doesn't seem to be supported by the EA, as it is noted that the population trend of Trinidad (and Las Animas Count) is in decline.	Kansas Division of Water Resources	Response: "and storage in Trinidad Reservoir" was added in front of "may be necessary to meet Trinidad's future municipal and industrial (M&I) needs. Also please see the Water Resources Section for a description of Trinidad's current water supply and vulnerability to a major disruption in treated water supply if their 30 year old pipeline is damaged. Additional M&I storage in Trinidad Reservoir plays an important role in providing water storage flexibility and water delivery system redundancy.
8	Page 7, Purpose and Need -Item 3) misstates the scope of the update to the Operating Principles as the proposed amend only deals with the City of Trinidad. Also in Item 3) as the proposed amendment only deals with the City of Trinidad. Also in Item 3), there may have been changes to the Operating Criteria that relate to PRWCD which haven't been clearly defined. However, the EA doesn't seem to evaluate any changes in the Operating Principles.	Kansas Division of Water Resources	See Comment and Response No. 5 above.
9	Page 7, Purpose and Need -Not sure of the need for the remaining two paragraphs in the Purpose and Need, as they don't relate to the stated Proposed Action (PRWCD's repayment contract). Nor do they provide any specific purpose or need for the amendment of the PRWCD repayment contract.	Kansas Division of Water Resources	The last two sentences address the purpose and need for changes to the Operating Principles and Operating Criteria, specifically Colorado Irrigation Improvement Rule 10 and compact compliance, which is discussed in Appendix C (2017 CDWR Approval of PRWCD's Irrigation Improvement Rules Compliance Plan).
10	Page 8, Background, Trinidad Project -USACE, Albuquerque District, Authorized & Operating Purposes for Trinidad Lake are Recreation under PL 78-534 and Flood Control, Irrigation and Sediment Control under PL 85-500.	USACE	The additional authorization reference for recreation was added to the Final EA.
11	Page 8, Background, Purgatoire River Water Conservancy District -Clarification...what does this difference between 19,499 and 20,607.9 acres mean?	USACE	See Response to Comment 12 below for more detail.
12	Page 8, Background, Purgatoire River Water Conservancy District -The reference to PRWCD contracted lands totals 20,607.9 acres is misleading. I believe that the acres under contract with PRWCD boundaries is more than 51,000 with the 20,607.9 acres under individual ditches by the Operating Principles, of which up to 19,499 acres less land removed from Irrigation can be irrigated.	Kansas Division of Water Resources	The referenced 20,607.9 acres was removed to avoid confusion. As identified in Reclamation's 2005-2014 Review of Operating Principles and Project Operations dated October 2017, "Articles II and Article IV B. use the terms "contracted lands" and "contracted acres," respectively. The terms are not defined in the current version of the Operating Principles and created confusion in how they should be applied during this review cycle.
13	Page 9, Proposed Action -Does 4, 5, & 6 belong under 3? If so, number them differently and indent.	USACE	This was clarified in the Final EA.
14	Page 10, Proposed Action -It is important to note that volumetric limits are on deliveries to storage for M&I. Suggest adding "address the conversion of Project Water from irrigation uses to Trinidad's M&I uses and the" to the first sentence of the 2nd paragraph and "storage of." Add "on Trinidad's deliveries of this additional water to M&I storage or permanent fishery pool storage not including delayed return flows" to the second sentence.	PRWCD	Change was incorporated into the Final EA.
15	Page 10, Proposed Action -last paragraph, change "expand" to "modify" and "reduce" to "correct and error in".	PRWCD	Change was incorporated into the Final EA.

Number	Comment	Agency	Reclamation Response
16	Page 10, Proposed Action -In the Proposed Action, three specific changes to PRWCD's repayment contract are listed. However, the listing for 3) is not complete as it suggests a description of the update to the standard contract articles that are not included "as follows." Items 4 and 5 are attachments and I would suggest having separate actions that need to be evaluated in the EA. Item 6) doesn't seem to be an action item but rather a statement of fact.	Kansas Division of Water Resources	This section was re-written and "as follows" was deleted. Items 4 and 5 are separate actions evaluated in the EA. Item 6 was deleted from the Proposed Action and moved to the Cumulative Impacts section of the EA.
17	Page 10, Proposed Action -Regarding than one proposed action (amend PRWCD's repayment contract) it really seems like there are several proposed actions that haven't been fully evaluated in this EA. For example, it is mentioned "The Operating Criteria amendments would authorize Model water to be stored in the Joint Use Pool space for release after the irrigation season to replace the loss of return flows associated with the conversion of lands from flood irrigation to sprinkler." But there is no evaluation of the impact of this operational change on the reservoir or water supply.	Kansas Division of Water Resources	See Comments above. Also, please see the Water Resources Section, regarding the example. The Draft EA included the following language: "Under the Proposed Action, Trinidad Reservoir elevations are generally expected to increase and remain higher during the irrigation season as previously described in the 2004 EA."
18	Page 10, Table 1- 1,127 acres should be 1,217 acres.	USACE	Corrected in the Final EA.
19	Page 12, Water Resources -Insert "is generally transferred to" in front of "the Joint Use Pool..." in the second paragraph.	PRWCD	Change was incorporated into the Final EA.
20	Page 12, Water Resources -Insert "storage" in front of "volumes" in the third paragraph.	PRWCD	Change was incorporated into the Final EA.
21	Page 12, Water Resources -Change "expand" to "modify" in the last paragraph.	PRWCD	Change was incorporated into the Final EA.
22	Page 14, Prime and Unique Farmlands -change "reduce" to "correct and error in" in the third paragraph.	PRWCD	Change was incorporated into the Final EA.
23	Page 15, Prime and Unique Farmlands -Last Paragraph, replace "mean less water is delivered for irrigation" with "accommodate the transfer of water from storage for irrigation to storage for M&I uses".	PRWCD	Change was incorporate into the Final EA.
24	Page 19, Cumulative Impacts - Do not understand, reportedly pending NRCS for future conversion projects.	USACE	Corrected in the Final EA to say "pending NRCS applications"
25	Page 14, Water Resources -The EA also briefly acknowledges changes required by the State Engineer's Irrigation Improvement Rules, but never explains their relevance. The reference to the Irrigation Improvement Rules appear related to the Operating Criteria changes, but again, this is difficult to evaluate without further discussion of the changes to the Operating Criteria, or the purpose and need for those changes. DNR additionally notes that Irrigation Improvement Rules became effective in 2011, not 2009 as is incorrectly stated in the EA.	CDNR	This section was edited to state: "The proposed amendments to the Operating Criteria require changes in Trinidad Reservoir storage accounting that supports the return flow requirements as described above already approved and implemented by the State of Colorado." "2009" was deleted and the Final EA was changed to read "The rules went into effect in 2011."
26	Page 16, Summary -The Summary should have more linkage on the Proposed Action(s). The Proposed Action was the amendment to the PRWCD repayment contract, which is not mentioned in the summary. That being said, the various proposed actions presented in this EA should have corresponding conclusions of the potential impacts presented in the summary.	Kansas Division of Water Resources	This section was update in the Final EA to provide more connectivity with the Final EA and the 2004 EA.

Number	Comment	Agency	Reclamation Response
27	Page 16, Summary -The EA has the following conclusion listed in its summary: "The Arkansas River will not be affected and the Proposed Action will not result in a material depletion at the Kansas State Line. Consequently, it will not impact the Arkansas River Compact." I do not believe that all changes were evaluated to determine their impacts. Even with regard to the proposed action on behalf of the City of Trinidad, I do not see a substantive evaluation.	Kansas Division of Water Resources	Reclamation's determination was based on 2004 EA and ARCA's Resolution No. 2012-01 and 2014-03.
28	Page 17, Land Use and Socioeconomics -Table 5 doesn't provide any Economic Data.	Kansas Division of Water Resources	The work "Economic" was removed from the caption. Available economics data is discussed in the text.
29	General Comment -DNR believes that the EA would benefit from additional context explaining the purpose and need for the EA. For example, the EA should explain the history of the amendments to the Trinidad Dam Operating Principles and why they are incorporated into the EA process for amendments to the repayment contract. The two processes have not been linked in the past, and the decision to include the amendments to the Operating Principles in a National Environmental Policy Act (NEPA) process has delayed the approval of those changes for years. Providing the reasoning for why the Operating Principles amendments needed to be approved through this process will set clearer expectations for the next time amendments are proposed. Furthermore, we believe that the context of how the Operating Principles amendments came to be proposed, and the buy-in they have already received from key players on the Purgatoire River, are essential for a complete understanding of the issue. The Arkansas River Compact Administration (ARCA) first approved these amendments at its 2012 meeting, then again in 2014 (when it agreed to split the 2012 amendments into two separate amendments so the more important change referenced in Resolution 2014-03 could move more quickly). This is briefly addressed on page 19 of the draft EA, but DNR believes that further discussion of ARCA's role and process would be useful.	CDNR	<p>Appendix G- 2004 Environmental Assessment was added to provide additional context. The Proposed Action was updated to separate Reclamation's actions to three general categories: 1) amend the repayment contract; 2) approve amendments to the Operating Principles; and 3) approve amendments to the Operating Criteria. For clarification, amendments to the operating principles and operating criteria have always required review under NEPA, as is indicated by the 2004 EA. Depending on the proposed amendments, some proposed changes may fit within Reclamation's existing categorical exclusion 516 DM 14-Operating and Maintenance Activities (14)- Approval, renewal, transfer, and execution of an original, amendatory, or supplemental water service or repayment contract where the only result will be to implement an administrative or financial practice or change. The scope of the proposed amendments to the Operating Principles and Operating Criteria did not meet this definition and therefore, an EA was required. It should be noted that the preparation of the EA did not cause the years of delay.</p> <p>As Reclamation described at the 2016 ARCA meeting, the delay was due to the proposed amendment potentially affecting the PRWCD's Repayment Contract with Reclamation. This is because the Repayment Contract is a variable rate contract which depends on the amount of water diverted through the headgates. The City of Trinidad's water however, does not go through the headgates. Instead, it is released from Trinidad Reservoir for augmentation purposes. Consequently, Reclamation determined that the headgate diversion definition must be amended in the Repayment Contract, to include the City of Trinidad water. Additionally, the Repayment Contract needed updating to include the revised PRWCD Irrigable Area acres which were amended in the 2004 Operating Principles.</p> <p>Reclamation initially worked directly with the City of Trinidad on amending the Operating Principles thinking the Repayment Contract amendment would be fast and simple. However, in 2015, after Reclamation prepared the proposed amendment and shared a draft EA with PRWCD, City of Trinidad, and USACE, PRWCD rejected amending the Repayment Contract. Consequently, Reclamation determined that discussions on amending the Operating Principles, which are an exhibit to the Repayment Contract, must involve PRWCD. In 2018, PRWCD indicated a desire to amend the Repayment Contract and the associated Operating Principles.</p>
30	General Comment -"John" or "Johns"?	USACE	John Ditch was the term incorporated into the Final EA for consistency.

Number	Comment	Agency	Reclamation Response
31	General Comment -The EA would also benefit from further explanation of the scope of the document. The EA addresses changes to the Operating Criteria, but not detailed discussion of those changes contained in the EA, and the Appendix B does not indicate the extent of the changes. The EA often references the Operating Criteria in tandem with the Operating Principles as if they are companion document, but they are very different. Five different signatories, including ARCA and Kansas, need to approve changes to the Operating Principles; that is not the case with the Operating Criteria. The EA would benefit from treatment these two documents, and the changes thereto, completely separately.	CDNR	The Final EA was updated to make it clearer that the Repayment Contract, Operating Principles, and Operating Criteria are three separate documents and that amendments to each document require Reclamation's approval.
32	General Comment -It should be noted that the City of Trinidad has filed an application to change the shares of the Pioneer Property in Case Number 2017CW3073.	CDNR	This was already included in the Draft EA in Page 10-"Water rights associated with the Pioneer Property are included in the additional acreages to be dried-up, but are subject to a pending case in Colorado Water Court (Case No. 17CW3073.)"
33	General Comments -I concur with the Colorado comment letter and reemphasize the following: 1) the needed separation of the Operating Principles and the Operating Criteria throughout the document; and 2) the extent of the changes to the Operating Criteria needs to be delineated, preferably through a redline strikeout of the attachment.	Kansas Division of Water Resources	See Responses to CDNR comments. Also redline strike versions of the proposed amended Repayment Contract, Operating Principles, and Operating Criteria have been added as Appendices A, B, and C.
34	General Comment -Upon reflection, this EA would have benefited from a review of the City's utilization of the reservoir which was provided under the 2004 Amendments to the Operations Principles.	Kansas Division of Water Resources	To keep this EA brief, Reclamation attached the 2004 Finding of Significant Impact for the 2004 Amendments to the Operating Principles rather than restate the 2004 analysis. To address the commenter's concern, Appendix F has been updated to include both the 2004 Final EA and FONSI.
35	General Comment -Throughout the document Johns Flood is referred to as John Flood.	Kansas Division of Water Resources, USACE	Both "Johns Flood" and "John Flood" have been used in various documents throughout the years. The actual name of the ditch listed in the court decrees is "John Flood Ditch" named after James John. For consistency, Reclamation decided to use "John Flood" throughout the Final EA.
36	Appendix B-Operating Principles -These two documents should be put into separate attachments as they are two distinctly different documents.	Kansas Division of Water Resources	Appendix B was separated into Appendices B & C in the Final EA.
37	Appendix B-Operating Principles -Regarding the proposed amended Operating Principles, the document found in Appendix B may have been inadvertently changed beyond the scope of the ARCA 2014-03 resolution. I cannot speak for signatory parties, but I would recommend that the format and style be consistent with the Operating Principles as amended in 2004. Any modifications to documents itself be limited to ARCA's 2014-03 resolution. If additional modification are needed, those should be presented at the next opportunity to amend the Operating Principles.	Kansas Division of Water Resources	This change was incorporated into the Final EA, so that the formatting and style of the Operating Principles is consistent with the Operating Principles as amended in 2004, with the exception that a footer was added to the Operating Principles proposed to be amended in 2018. ARCA's 2014-03 Resolution is included in Appendix F. For consistency, the same redline-strikeout Exhibit to the Resolution is included in Appendix B to show the amended table and preceding paragraph.