STATE OF COLORADO

Colorado Water Conservation Board
Department of Natural Resources
1313 Sherman Street, Room 721
Denver, Colorado 80203
Phone: (303) 866-3441
Fax: (303) 866-4474
www.cwcb.state.co.us

TO: Colorado Water Conservation Board Members

FROM: Ted Kowalski, Chief, Interstate, Federal & Water Information Section
Steve Miller, Sr. Water Resource Specialist

SUBJECT: **Agenda Item 19, May 21-22, 2014 Board Meeting Interstate, Federal, and Water Information Section, Arkansas Valley Conduit Presentation**

This is an informational item in which Mr. Jim Broderick, General Manager of the Southeastern Colorado Water Conservancy District ("SECWCD"), will update the Board on recent progress and future activities regarding the Arkansas Valley Conduit Project. The Conduit is an authorized, but long delayed, feature of the Fryingpan-Arkansas Project designed to provide high quality municipal and domestic water to the communities in the Lower Arkansas Valley between Pueblo and Lamar.

While the Fry-Ark Project was authorized in 1962 and the principal feature, Pueblo Reservoir, was completed in 1975, the Conduit was never constructed due to the apparent inability of the local participants to pay for that feature. In the 1990s, as part of the SECWCD's "Storage Needs Assessment Study" (funded in part by the Board), interest in and support for the Conduit was revived and new financing alternatives were proposed. A significant portion of the eventual funding plan is the $60 million loan already authorized from the CWCB Construction Fund. Mr. Broderick will fill in some of the subsequent history and details of the current plans, but in short, things have progressed to point where NEPA compliance has been completed and a Record of Decision has been issued by the US Bureau of Reclamation.

The following materials are attached to provide additional background information about the Conduit Project:

- USBR Newsletter dated June 2013
- USBR Press release dated Feb. 27, 2014
- Excerpt from USBR Record of Decision, dated Feb. 27, 2014

Staff Recommendation:
There is no staff recommendation, although the Board may wish to consider ways to support expeditious development of this critical project.

RECLAMATION

Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

Newsletter
Arkansas Valley Conduit
Long-Term Excess Capacity Master Contract
Environmental Impact Statement
Fryingpan-Arkansas Project, Colorado

June 2013

In August 2013 the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) will release the Final *Arkansas Valley Conduit and Long-Term Excess Capacity Master Contract, Fryingpan-Arkansas Project Environmental Impact Statement* (Final AVC EIS) evaluating the Arkansas Valley Conduit (AVC). The AVC is a proposed water supply project that would serve the needs of communities in the lower Arkansas River valley. It would include a pipeline, called an "Interconnect" to convey water between the existing north and south outlet works at Pueblo Reservoir. The Final EIS also discloses the environmental impacts of a proposed long-term excess capacity master contract, which would allow participants to store water in Pueblo Reservoir. This newsletter updates readers on EIS activities and identifies Comanche North as the agency-preferred alternative in the Final EIS.

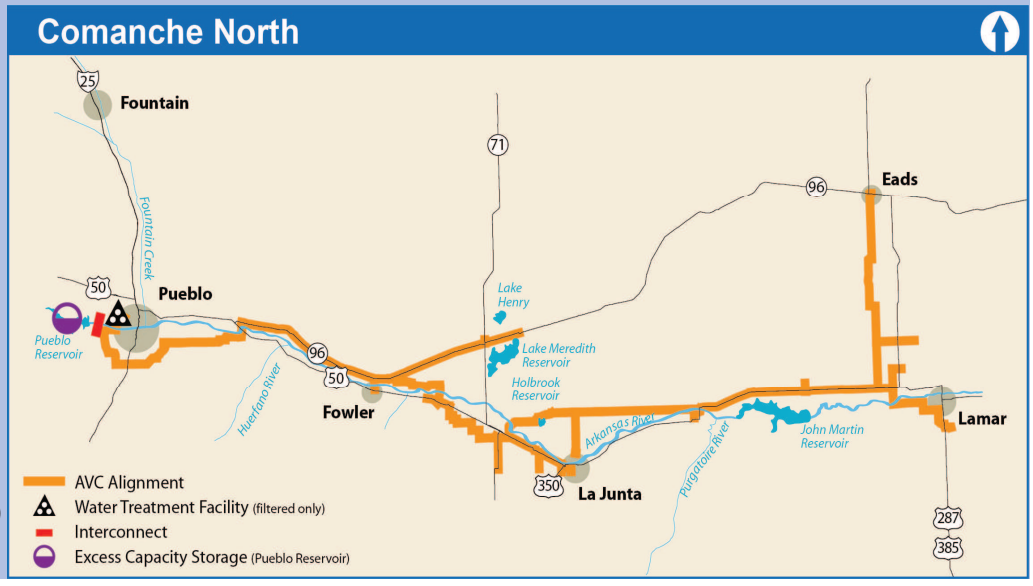
Preferred Alternative: Comanche North Alternative

The Comanche North Alternative minimizes cost and urban construction disturbance, avoids the U.S. Highway 50 expansion corridor, and maximizes source water quality and yield. It is a hybrid alternative developed in response to comments on the Draft AVC EIS by using components of alternatives analyzed in that document.

Comanche North Alternative:

- Includes the AVC, Interconnect and Master Contract.
- Diverts water from the existing Joint Use Pipeline (JUP) immediately upstream from Pueblo Boulevard, north of the Arkansas River, and constructs a new pipeline to the existing Whitlock Water Treatment Plant. The JUP is an existing pipeline that currently delivers water from Pueblo Reservoir to the Whitlock Water Treatment Plant. The Comanche North and JUP North alternatives would use excess capacity available in the JUP.
- From Whitlock Water Treatment Plant, a new pipeline south of Pueblo to St. Charles Mesa and Avondale crosses Interstate 25 southwest of the Comanche Power Plant. East of Avondale, the new pipeline would

(continued on page 2)



Development of the Comanche North Alternative

The Draft EIS was released for public view in August 2012. During the public review period, Reclamation held five public hearings in September 2012 to inform people about the proposed actions and to solicit comments. A total of 200 comments were received from reviewing state and federal agencies, organizations, and interested and potentially affected members of the public.

In response to several public comments and recommendations, the alternatives were re-examined to see if mixing pipeline routes, water treatment options, and other engineering features would decrease costs and minimize infrastructure effects in Pueblo. The JUP, Interconnect, Master Contract, and various routes of AVC pipeline segments were incorporated into a hybrid alternative called Comanche North. The Comanche North Alternative replaced Comanche South and is evaluated in the Final AVC EIS.

EIS Team Guided by Criteria-Based Alternative Ranking Process

Through a structured alternative development and screening process, seven alternatives were identified for evaluation in the Draft AVC EIS. The goal of this process was to identify a range of reasonable alternatives to meet the purpose and needs of the AVC, Interconnect, and Master Contract.

Each alternative was ranked from 1 to 7, with 1 for the alternative that best met the criteria and 7 for the alternative that least met criteria.

To help identify a preferred alternative for the Final AVC EIS, the EIS team developed alternative rankings to summarize performance, cost, engineering, and environmental data.

Purpose and Need

Purpose and need criteria were emphasized based on the *2012 Reclamation National Environmental Policy Act Handbook* guidelines on purpose and need:

- The preferred alternative should complete the action and best meet the purpose and need for the action as defined in the EIS.
- The preferred alternative should have the consensus of the affected community and be reasonable and practicable, meet the purpose and need for action, and be within Reclamation's statutory authority to implement.

The purpose and need for the federal proposed actions, as defined in the EIS, included four criteria: source water quality and source water quantity, redundancy, and reliability. Criteria and ranking were defined as follows:

- Source Water Quality: Refers to the quality of water to be used by the water treatment plant. Five alternatives use Pueblo Reservoir water and received the best ranking. Use of water from the Arkansas River above Fountain Creek resulted in a less favorable ranking and use of existing groundwater and surface water downstream from Fountain Creek resulted in the worst ranking.
- Source Water Quantity: Assesses the necessary annual water demand. All alternatives met the

(continued on page 3)

Comanche North Alternative:

(continued from page 1)

run generally north of the Arkansas River, except between Manzanola and Rocky Ford. The pipeline and spurs would be about 227 miles long, with primary spur pipelines along State Highway 96 and north of Highway 50 to serve Eads. Pipeline sizes would range from 36 inches in diameter from the JUP to 4 inches at some AVC participant tie-in locations.

- Integrates new water treatment plant components into the existing Whitlock Water Treatment Plant.
- Delivers filtered water to the St. Charles Mesa Water District.
- Builds pumping stations at the Whitlock Water Treatment Plant and at the south end of the spur to Eads.
- Allows Master Contract participants to store up to 29,938 ac-ft of water (an acre foot is approximately the size of a football field filled with water 1 foot deep) in Pueblo Reservoir.
- Results in estimated cost of construction: $400 million; estimated cost of annual operations, maintenance and replacement: $3.5 million; estimated annual costs for the Master Contract: $0.8 to $1.1 million.

Table 1. Alternatives Ranking Used to Identify the Preferred Alternative

Alternative	Criteria Ranking					Overall Sum	Overall Rank
	Purpose and Need: Water Quality	Purpose and Need: Quantity, Redundancy, and Reliability	Financial	Engineering and Realty	Environmental Effects		
No Action	6	7	2	1	1	17	2
Comanche North	1	1	1	3	4	10	1
Pueblo Dam South	1	3	4	5	5	18	3
JUP North	1	5	3	6	7	22	6
Pueblo Dam North	1	1	7	4	5	18	3
River South	5	3	6	7	3	24	7
Master Contract Only	6	6	4	1	2	19	5

Note: Standard competitive ranking methodology was used to rank alternatives. An alternative was assigned its relative rank (for example, the sixth best alternative would be ranked 6, even if the first five alternatives tie and are each ranked 1).

Comanche North Alternative Receives Best Ranking Among Alternatives

(continued from page 2)

annual demand threshold, so all received the best ranking.

- Redundancy: Refers to a back-up system to prevent disrupting water delivery from Pueblo Reservoir. Three alternatives received the best ranking because they include the Interconnect that provides water delivery redundancy. Alternatives without the Interconnect received a lower ranking. Alternatives without the Interconnect and AVC received the worst ranking.
- Source Water Reliability: Refers to source water reliability and drought protection. Alternatives with AVC and Master Contract received the best ranking. Alternatives with the Master Contract but without AVC received a less favorable ranking, followed by a worse ranking for alternatives with just AVC. The No Action Alternative received the worst ranking because it did not have the same level of reliability as the action alternatives.

Additional Criteria

Regarding financial values, alternatives were ranked on an estimated cost of construction and annual operation, maintenance, and contracting costs. The least expensive alternative was assigned the best ranking, the next least expensive a less favorable ranking, and so on.

The Engineering and Realty criterion evaluated the physical features and constructability of alternatives. The alternatives ranked best if they had lower pumping requirements (fewer operating and maintenance costs and greenhouse gas emissions); treated water according to preferred Colorado Department of Public Health and Environment methods; had less construction risk related to utilities, public safety, and business disruptions; had fewer effects on industrial, commercial, and residential zones.

The environmental effects category rankings assessed a wide range of environmental effects and were based on direct and indirect effects outlined in the forthcoming Final AVC EIS.

Total Rankings

The rankings for each alternative and criteria are in Table 1. Based on the alternatives ranking process, the Comanche North Alternative received an overall ranking of 1, the best of 7 alternatives evaluated. As a result, Reclamation identified Comanche North as the preferred alternative.

Identifying the preferred alternative does not define Reclamation's final decision. Other considerations may result in a change in the preferred alternative and may even result in the final decision (recorded in the Record of Decision) not being the preferred alternative identified in the Final EIS.

Great Plains Region
Billings, Mont.

Media Contact: Tyler Johnson
(406) 247-7609

Released On: February 27, 2014

Reclamation Releases Record of Decision on Arkansas Valley Conduit

Reclamation selects Arkansas Valley Conduit for construction using the Comanche North Alternative

BILLINGS, Mont. -- Bureau of Reclamation Great Plains Regional Director Michael Ryan has signed the Record of Decision for the Arkansas Valley Conduit and Long Term Excess Capacity Master Contract Final Environmental Impact Statement. The selected alternative is construction of the Arkansas Valley Conduit using the Comanche North Alternative.

"This project will help water providers throughout the Arkansas River Basin meet existing and future demands," said Ryan. "While funding details remain to be coordinated, it is prudent this project move forward to be in a position to take advantage of federal, state or local funding opportunities when they arise."

The Arkansas Valley Conduit is a feature of the Fryingpan-Arkansas Project. It will provide treated water to communities in southeastern Colorado. When complete, the pipeline for the Arkansas Valley Conduit could be up to 227 miles long. The Comanche North Alternative includes three federal actions:

- Construct and operate the Arkansas Valley Conduit and enter into a repayment contract with Southeastern Colorado Water Conservancy District.
- Enter into a conveyance contract with various water providers for use of a pipeline interconnect between Pueblo Dam's south and north outlet works.
- Enter into an excess capacity master contract with Southeastern Colorado Water Conservancy District to store water in Pueblo Reservoir.

"For the many small rural water providers the conduit will serve, this critical step in the process of building the project is greatly welcomed. Facing the water quality and waste water discharge compliance challenges has been daunting for this area, and the congressional approval in 2009 and now the Record of Decision from the Bureau of Reclamation provide real hope for an effective and efficient way to meet those challenges," said Bill Long, President of the Southeastern Colorado Water Conservancy District.

A Record of Decision is a decision document; it concludes the environmental impact statement prepared in compliance with the National Environmental Policy Act. It does not provide or allocate funding for the project. Reclamation published the final environmental impact statement in August, 2013.

"The District is grateful for this decision, which is one more milestone in a half-century journey to a clean water supply for southeastern Colorado. As federally-mandated standards have changed, the need for the solution the preferred alternative provides is even greater. The promise to build this piece of the project was first made in 1962 by President Kennedy and was restated in 2012, right here in Pueblo, Colorado, by President Obama. Now let's move forward to the next phases of design and construction," said Jim Broderick, General Manager for the Southeastern Colorado Water Conservancy District.

For more information on the Record of Decision, please visit www.usbr.gov/avceis. To obtain a hard copy of the Record of Decision, contact Doug Epperly at (406) 247-7638 or depperly@usbr.gov.

# # #

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at www.usbr.gov.

Relevant Links:

RECLAMATION

Managing Water in the West

Record of Decision for the Arkansas Valley Conduit and Long-term Excess Capacity Master Contract Final Environmental Impact Statement

Approved:

Michael J. Ryan, Regional Director
Great Plains Region
Bureau of Reclamation
Department of the Interior

FEB 27, 2014
Date

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

Introduction and Decision to be Made

Introduction

"It's kind of hard to argue against clean drinking water and frankly, it's something that should have gotten done a long time ago. My general theory is a bill that was passed authorizing a project when I was born should be finished by now."
-- President Barack Obama, speaking of the proposed Arkansas Valley Conduit in Pueblo, Colo. on August 9, 2012.

The President's August 2012 visit to the community of Pueblo, Colorado and the Lower Arkansas River Valley coincided with the 50th anniversary of the federal Fryingpan-Arkansas Project (Fry-Ark), a water delivery system designed and built to provide clean water for agricultural, municipal and industrial use across southeastern Colorado. Although the project was authorized in 1962, one major component, the Arkansas Valley Conduit (AVC), has yet to be constructed. As a result, the people of the agricultural communities in the southeast corner of the state have been waiting more than 70 years for safe drinking water.

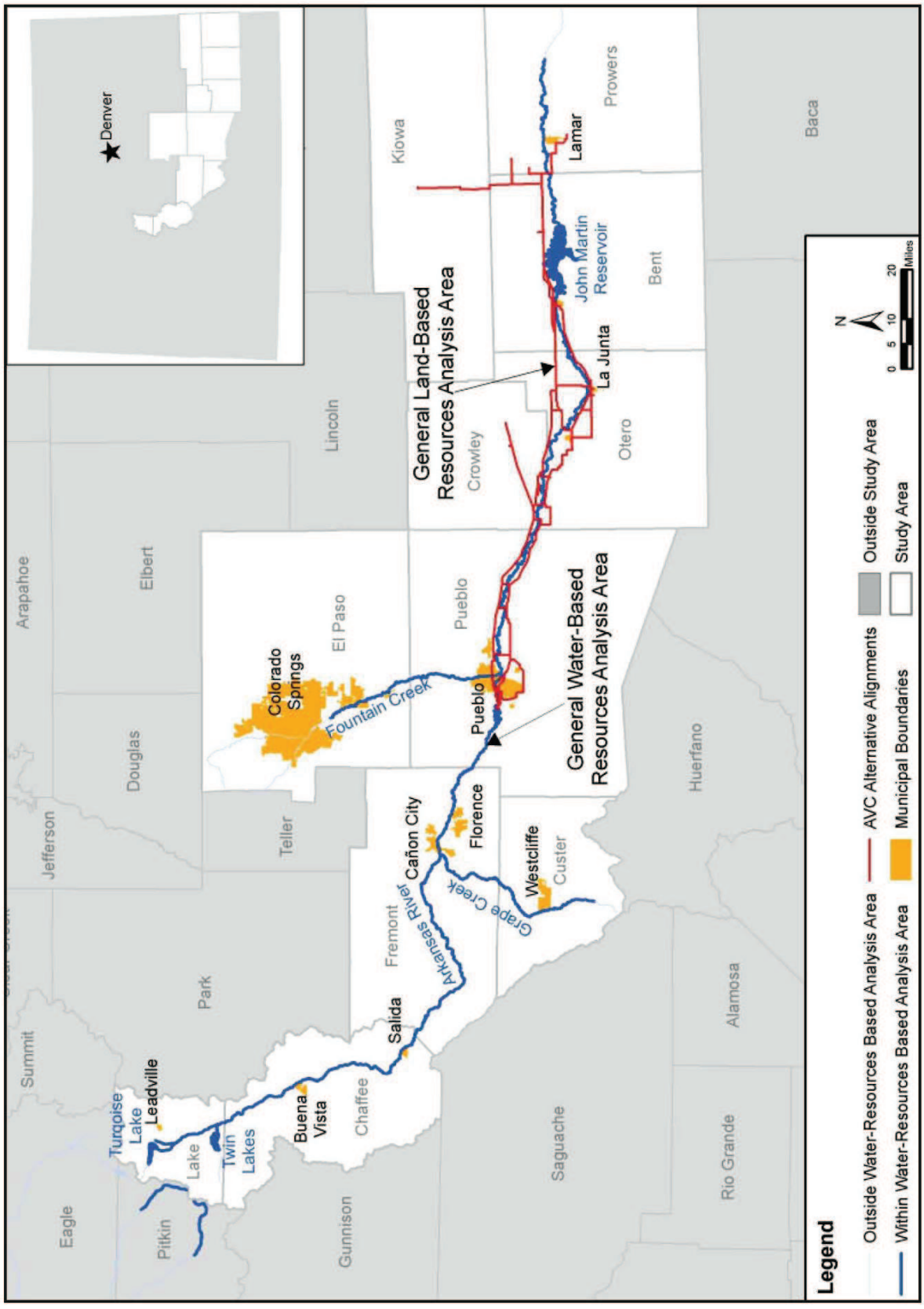
The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) is issuing this Record of Decision selecting the AVC for construction using the Comanche North Alternative, consistent with the policies and programs of the President.

The Lower Arkansas Valley

"The Lower Arkansas Valley water systems are failing and with the water quality standards changing at a rapid rate, they need this project for the future of their communities."
--Dwight Gardner, resident of Ordway, Colorado

Currently, the Lower Arkansas River Basin communities in southeastern Colorado use groundwater wells to supply most of their drinking water. Now, that supply is in question. More and more towns are finding their groundwater contains cancer-causing radioactive contaminants including naturally occurring radium and uranium. Twelve water providers are currently under orders by the Colorado Department of Public Health and Environment to remove the radioactivity using expensive treatment technology, or to find a better quality water source.

To address these issues, Reclamation prepared the *Arkansas Valley Conduit and Long-Term Excess Capacity Master Contract Final Environmental Impact Statement* (Final EIS) in August 2013 that discloses potential environmental consequences associated with constructing and operating the proposed AVC, entering into a conveyance contract for the Pueblo Dam north-south outlet works interconnect (Interconnect), and entering into a long-term excess capacity master contract (Master Contract). These facilities and contracts are needed in the Arkansas River Basin precisely because they would deliver water that meets federal and state drinking water standards, provide for existing and future water demands, and provide system redundancy for water deliveries. The study area in the Final EIS covers much of southeastern Colorado (see map on page 2).


Denver
General Land-Based Resources Analysis Area
General Water-Based Resources Analysis Area
Colorado Springs
Fountain Creek
Pueblo
Cañon City
Florence
Westcliffe
Grape Creek
Arkansas River
Salida
Buena Vista
Twin Lakes
Turquoise Lake
Leadville
Lake
Lamar
John Martin Reservoir
La Junta
Summit
Eagle
Pitkin
Gunnison
Chaffee
Park
Fremont
Custer
Teller
Douglas
Jefferson
Arapahoe
Elbert
El Paso
Pueblo
Lincoln
Crowley
Otero
Kiowa
Bent
Prowers
Baca
Huerfano
Alamosa
Saguache
Rio Grande
Legend
Outside Water-Resources Based Analysis Area
Within Water-Resources Based Analysis Area
AVC Alternative Alignments
Municipal Boundaries
Outside Study Area
Study Area
N
0 5 10 20
Miles

the water provider delivery points. Under this alternative, the St. Charles Mesa Water District would be delivered unfiltered water.

Master Contract Only Alternative

To provide a range of reasonable and practicable alternatives for evaluation in the Final EIS, the Master Contract Only Alternative does not include federal actions to build the AVC or Interconnect. The Master Contract would include up to 29,938 ac-ft of excess capacity storage in Pueblo Reservoir. Each water provider would request that Reclamation release water from Pueblo Reservoir to either the Arkansas River to an existing or future water delivery system, or exchange water to an upstream location. Water could be stored and released if and when space is available after other Fry-Ark commitments have been met. Contract terms and costs for using Pueblo Reservoir excess capacity would be determined during contract negotiations.

Without the AVC or Interconnect, AVC and Interconnect water providers would pursue actions similar to those previously described in the No Action Alternative to meet water supply and water quality needs.

Decision and Rationale for Decision

"This valley's towns need the quality water from the Pueblo Reservoir to remain in a growth situation rather than the opposite effect of dealing with individual treatment plants and poorer quality water as individuals."

--Nancy Moore, resident of Otero County

Decision

Reclamation has taken a hard look at the impacts of constructing the AVC in the Final EIS, as well as the consequences of not constructing the AVC (No Action). Reclamation has also listened to the comments of people in the lower Arkansas Valley, cooperating agencies, community leaders, state and federal political leaders, and the President. With all this in mind, Reclamation has selected the Comanche North Alternative for implementation.

Rational for Decision

Decision Not to Select No Action

"We believe that the No Action Alternative is not a reasonable alternative for water providers in the Arkansas Valley, especially those of us under an enforcement order from the Colorado Department of Public Health & Environment for not meeting drinking water standards with the radionuclide rule...The waste disposal of radionuclides is simply too expensive."

"A No Action Alternative leaves South Swink Water Company and many others without drinking water that meets standards."

--John Hostetler, President, South Swink Water Company

Reclamation found that the costs of the No Action Alternative exceed its benefits. Simply put, families and communities across the Lower Arkansas Valley face the insurmountable problem of rising water treatment costs in a declining local economy. Without a realistic option for coming decades, these same communities will soon spend themselves out of sustainable water treatment.

Reclamation did not select the No Action Alternative for implementation for the following reasons:

- *The No Action Alternative Would Not Meet National Secondary Drinking Water Regulations.* Not meeting secondary water quality regulations will result in increased OM&R costs exacerbating the economic disadvantages of the area. The Environmental Protection Agency (EPA) has established National Secondary Drinking Water Regulations for 15 contaminants. These guidelines assist public water systems in managing contaminants in drinking water that do not risk human health but do have economic consequences because of objectionable color, odor, and taste and detrimental effects on equipment. EPA states these contaminants "may cause a great number of people to stop using water from their public water system even though the water is actually safe to drink (2013)."

- *The No Action Alternative Could Have Significant Economic Implications.* No Action Alternative water sources are particularly high in two contaminants - sulfates and total dissolved solids. Sulfates are associated with undesirable aesthetic effects on water, while total dissolved solids have corrosion and scaling effects that lead to premature deterioration of distribution pipes, water treatment equipment, and household appliances. Many of the No Action Alternative water supplies exceed the total dissolved solids standard, some by more than 500%. EPA (2013) states corrosion caused by high total dissolved solids can, "have significant economic implications" due to impacts on pipes. EPA describes scaling impacts as "mineral deposit which builds up on the insides of hot water pipes, boilers and heat exchangers, restricting or even blocking water flow." Total dissolved solids cannot be removed by conventional water treatment, requiring "fairly expensive technologies and may be impractical for smaller systems."

- *The No Action Alternative Would Have Negative Net Benefits.* Economic analysis estimates benefits of No Action range from $194.78 to $239.88 million, while the costs of No Action range from $307.31 to $308.43 million (construction cost of $192 million, present value of annual costs of $112.17 million, and short-term excess capacity storage costs of $3.14 million to $4.26 million), resulting in estimated net benefits of -$113.65 million to -$67.43 million. <u>The net benefits of No Action are negative under all benefit and cost scenarios.</u>

- *The No Action Alternative Would Cost $33 Million More in OM&R than Comanche North.* The water treatment facilities under the No Action Alternative are expected to cost significantly more to operate, maintain, and replace than treatment of AVC water by

Comanche North. Many of the communities being served are economically disadvantaged; this would be an additional economic burden. The estimated cost per month of No Action would more than double the cost of water, which could be interpreted as evidence of financial hardship and rate shock.

- *The No Action Alternative Would Lack the Water Delivery Reliability of Comanche North.* Without the Interconnect there would be no operational redundancy for entities taking water deliveries from Pueblo Reservoir, such as the Southern Delivery System (Colorado Springs) and the Fountain Valley Conduit, in the event that either of Pueblo Dam's two outlets is not operational.

Economic Benefits of Action vs. No Action

> *"One of the things that I don't think you did address in your costs was the savings that's going to be realized by folks right here. Ask Pat Palmer what it costs him to soften enough water to wash cars or run his sub shop or anybody else in town that serves food."*
> --Bill Rich, Hasty Water Company

Benefits

This decision takes into account a final economic analysis based on the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies entitled *Arkansas Valley Conduit and Long-Term Excess Capacity Master Contract, Evaluation of the Economic Feasibility of Appraisal Level Alternatives* (Principles and Guidelines Study). The study quantified the benefits of additional water supplies, water quality improvements, avoided transit losses, avoided maintenance and monitoring losses with the Interconnect, reductions in greenhouse gas emissions and meeting drinking water standards. Values were derived from previous economic studies for domestic and commercial water supplies, net farm revenue from irrigated agriculture, health-related benefits from meeting primary drinking water standards, and future carbon dioxide prices.

Table 4. Comparison of the Benefits of the No Action Alternative to the Comanche North Alternative

Benefit	No Action Alternative	Comanche North Alternative
Improved Water Quality (excludes radionuclide improvement)	🔴	🟢
Improved Radionuclide Water Quality	=	=
Excess Capacity Water Supply (excludes rotational fallowing contract)	🔴	🟢
Excess Capacity Water Supply (rotational fallowing contract only)	🟢	🔴
Reduced Greenhouse Gas Emission	🔴	🟢
Reduced Transit Losses	🔴	🟢
System Redundancy (Interconnect)	🔴	🟢

Key:
🟢 – more beneficial 🔴 – less or not beneficial = – benefits are equal

Costs

In conjunction with the AVC EIS, Reclamation conducted appraisal studies for the EIS alternatives (Reclamation 2012a, 2013). The Appraisal Design Reports prepared construction and operating, maintenance, and replacement cost estimates for planning, evaluating, and comparing alternatives and features (Table 5). Comanche North is the least expensive of the AVC water supply action alternatives.

Table 5. Estimated Costs of Alternatives

COST DESCRIPTION	COSTS ($ MILLION) [1][2]						
	NO ACTION	COMANCHE NORTH	PUEBLO DAM SOUTH	JUP NORTH	PUEBLO DAM NORTH	RIVER SOUTH	MASTER CONTRACT ONLY
Construction [3]	192	400	495	495	505	475	192
Annual OM&R [3]	5.0	3.5	3.4	3.8	3.8	4.2	5.0
Annual Master Contract [4]	0.1 - 0.2	0.8 - 1.1	0.8 - 1.1	0.1 - 0.2	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1

Notes:
[1] These cost estimates are not suitable for construction funding appropriations from Congress.
[2] Costs are in 2011 dollars.
[3] Construction and OM&R costs for Comanche North, Pueblo Dam South, JUP North, Pueblo Dam North, and River South costs from appraisal design reports (Reclamation 2012a, 2013a). Construction and Operation, Maintenance, and Replacement (OM&R) costs for No Action and Master Contract Only alternatives from Appendix B.3.
[4] Master Contract costs presents range of costs.

Benefit-Cost Analysis

In the Principles and Guidelines Study Reclamation compared the benefits of the action alternatives to the costs of those alternatives (Table 6). Although most Principles and Guidelines analyses are based on feasibility-level alternatives, this analysis is based on appraisal engineering design and would be considered appraisal level.

Based on that study, Comanche North would be the least expensive action alternative to construct at $400 million, as compared to other action alternatives that would cost $475-505 million. Present value of OM&R is $78.85 million for Comanche North, in comparison to No Action and Master Contract Only at $112.17 million. The other AVC alternatives present value of OM&R ranges from $76.48 – $98.53 million.

The preliminary benefit-cost ratio of Comanche North ranges from .78 to 1.02. The other AVC alternatives benefit-cost ratios are lower with a high end range from .56 to .86. A range of net benefits and benefit-cost ratios are estimated which reflects a level of uncertainty that is expected at the appraisal level of analysis. A benefit-cost ratio greater than 1.0 indicates benefits exceed costs.

Table 6. Comparison of Benefits-Costs of the No Action Alternative to the Comanche North Alternative

Action Alternative	Benefits (millions$)	Costs (millions$)	Net Benefits (millions$)	Benefit-Cost Ratio
Comanche North	427.21 to 549.66	539.27 to 545.33	- 118.12 to + 10.39	.78 to 1.02
No Action	194.78 to 239.88	307.31 to 308.43	- 113.65 to - 67.43	.63 to .78

Although the *Principles and Requirements for Federal Investments in Water Resources* (P&R) were established in March 2013, the P&R will not be in effect until 180 days after publication of final Interagency Guidelines. The exact form of a P&R analysis is not yet known because the final Interagency Guidelines have not been completed. However, the P&R consider environmental and social goals in addition to economic goals. This means that there would likely be some additional benefits recognized under the P&R for Comanche North that were not included in the P&G analysis. These benefits would likely not be realized or would be substantially less under the No Action Alternative.

Reclamation compared all alternatives in the Final EIS in terms of how well each addressed purpose and need, relevant environmental and non-environmental issues identified by Reclamation during the EIS process, and estimated costs (Table 7). The Comanche North Alternative ranked number one.

Table 6. Alternatives Ranking Used to Identify the Preferred Alternative

Alternative	Criteria Ranking					Overall Sum	Overall Rank
	Purpose and Need: Water Quality	Purpose and Need: Quantity, Redundancy, and Reliability	Financial	Engineering and Realty	Environ-mental Effects		
Comanche North	1	1	1	3	4	10	1
No Action	6	7	2	1	1	17	2
Pueblo Dam South	1	3	4	5	5	18	3
Pueblo Dam North	1	1	7	4	5	18	3
Master Contract	6	6	4	1	2	19	5
JUP North	1	5	3	6	7	22	6
River South	5	3	6	7	3	24	7

Note: Standard competitive ranking methodology was used to rank alternatives. An alternative was assigned its relative rank (for example, the sixth best alternative would be ranked 6, even if the first five alternatives tie and are each ranked 1).

Agency Mission Considerations

The decision to construct the AVC is consistent with Reclamation's mission "to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public." Testimonials during Reclamation's NEPA public proceedings for the AVC were no different than those Reclamation heard across various rural water public processes. Like the others, those commenting on the AVC expressed many of the same concerns for safe and clean drinking water and also expectations of good governance from federal agencies like Reclamation.

Reclamation has witnessed the benefits of "managing, developing, and protecting" clean water in the course of construction of rural water projects like the Southwest Pipeline; Lewis & Clark Regional Water System; Mid-Dakota Rural Water System; Mni Wiconi; and Perkins County Rural Water Systems. All of these projects cited good quality water that meets secondary drinking water standards as an important purpose and/or need of the project. Our observation is when clean water is a reality, businesses can turn their attention to new opportunities, communities can gain stability, and people have one less thing to worry about.

"This is very exciting for Mercer County. The people getting this water are ecstatic to be able to turn on their faucets and have good tasting water, instead of the brown, icky water they had before."

--Marie Johnson, Director, Southwest Water Authority, North Dakota

Comanche North Alternative Selection Summary

Based on the above and the following reasons, the Comanche North Alternative was selected for implementation:

- The Comanche North Alternative will complete the action; will best meet the purpose and need for the action; has the consensus of the affected community; is reasonable and practicable; and is within Reclamation's statutory authority to implement (Reclamation 2012b).

- Regarding purpose and need, the Comanche North Alternative will deliver water that meets both primary and secondary drinking water standards. The preferred alternative will also meet future annual participant demands, assuming base levels of conservation; includes the Interconnect as a back-up system that will minimize water delivery disruptions from Pueblo Reservoir; and the Master Contract that will increase supply reliability and drought protection.

- The Comanche North Alternative is less expensive than other alternatives that would fully meet purpose and need.

- The Comanche North Alternative will integrate new water treatment plant components into the existing Whitlock Water Treatment Plant, which will minimize water treatment plant construction costs and terrestrial effects.

- The Comanche North Alternative's alignment south of Pueblo will have less construction risk, urban construction disturbance, and real estate constraints than other alternatives that will fully meet purpose and need. East of Pueblo, aligning the AVC pipeline north of the river avoids most of the U.S. Highway 50 corridor.

- When coupled with proposed mitigation measures described in Appendix A, the Comanche North Alternative will have similar or fewer environmental effects compared to other alternatives that meet purpose and need.

This decision would have no impacts on Indian Trust Assets (ITAs). The Final EIS documents that no ITAs were identified in the study area and, as such, no impacts to ITAs will occur.

Southeastern, who represents the communities to be served by the AVC, supports selection of the Comanche North Alternative. Southeastern, in particular, was involved in developing this alternative, including identifying key measures to reduce project costs.

Environmentally Preferable Alternative

Council on Environmental Quality regulations require the Record of Decision to identify one or more environmentally preferable alternatives (40 C.F.R. § 1505.2(b)). Ordinarily, an environmentally preferable alternative is one that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources. After considering and balancing the full range of adverse and beneficial environmental effects of all alternatives examined in the Final EIS, Reclamation concludes that the No Action Alternative is environmentally preferable. However, the No Action Alternative has a number of impacts and disadvantages outlined in the *Decision Not to Select No Action* section, including not meeting the project purpose need, especially water quality and reliability. Although the No Action Alternative would have the least environmental effects because of fewer ground disturbing activities, the Comanche North Alternative will have the fewest environmental effects of action alternatives that meet the purpose and need.

Summary of Substantive Comments on the Final Environmental Impact Statement

"We support this project's examination of means to improve public health protection by reducing dependence on poor quality drinking water sources for 14 of the AVC participants that have been or currently are under enforcement order from the Colorado Department of Public Health and Environment."
--Suzanne J. Bohan, Director, NEPA Compliance and Review Program,
Office of Ecosystems Protection and Remediation, EPA, September 23, 2013

The mandatory 30-day waiting period before signing a Record of Decision that follows EPA's publication of the Final EIS notice of availability ended on September 23, 2013. During the