ArkDSS Memorandum
Final

To: Bill Tyner and Kelley Thompson, Colorado Division of Water Resources

From: Wilson Water Group

Subject: Task 2.1 – Interview Water Users and Providers
Notes from Water District 19 Meeting

Date: February 2019

Introduction

This memorandum provides notes from the August 29, 2017 meeting with the Water District 19 Water Commissioner. Water District 19 encompasses the Purgatoire River Basin beginning about 40 miles upstream of the confluence with the Arkansas River (the most downstream portion of the basin is included in Water District 17). Meetings were held with Water Commissioners in each Water District in the ArkDSS study area. The objectives of these meetings were to 1) develop an initial basin understanding; 2) determine diversion and reservoir structures that should be included in future detailed modeling efforts, and 3) determine which reservoirs and diversions warrant more detailed investigation and technical documentation. These objectives support Task 3 Consumptive Use Analysis and Task 4 Surface Water Modeling. Information in this memorandum is believed to be accurate; however, this information should not be relied upon in any legal proceeding.

Approach

In preparation for the meeting, Water District 19 data were compiled and reviewed using the following procedure outlined in the ArkDSS Scope of Work:

1. Review the availability of diversion, reservoir storage, and streamflow data
2. Review historical call data and identify how it may vary from current call reporting standards.
3. Identify net absolute water rights for structures in each Water District. Review the irrigated lands master parcel set and ditch service to identify ditches with water rights and/or diversions records but for which irrigated areas have not been identified.
4. Develop an initial list of key structures and structures with acreage and water rights, but no diversion records to understand areas without records and how to estimate their use.

Maps were also developed displaying reservoirs, diversion headgate locations, and irrigated acreage of the Water District to facilitate the discussions.

The interview with the Water Commissioner was intended to determine structures that should be considered key based on seniority, water administration, or basin operations. Because much of the irrigated acreage in the Water District 19 had inaccurate ditch assignments, the interview also served to correct irrigated parcels and ditch assignments required for modeling purposes.

Prior to the meeting, a brief description of the purpose and goals of the interview was provided to the Water Commissioner. The following is a summary of the meeting agenda:

1. Review straight-line diagrams for accuracy
2. Develop a list of major projects, reservoirs, and ditches in the water district, including names of knowledgeable contact people
3. Gather information on dry-up points in the river, calling rights, augmentation plans, and administration specific to the water district
4. Gather general information on the preliminary list of irrigation diversions selected to include in future detailed modeling efforts (key structures), and solicit input on their final inclusion
5. Develop information on reservoirs, such as owner entities, ditches that get reservoir deliveries, assigned delivery losses, etc.
6. Correct irrigated acreage information

Meeting Attendance

The meeting was held at the Division of Water Resources (DWR) Office in Pueblo. The following people attended the meeting:

Steve Witte, DWR, Division 2 Engineer
Bill Tyner, DWR, Assistant Division 2 Engineer
John Van Oort, DWR, River Operations Coordinator
Jeff Montoya, DWR, Water District 19 Commissioner
Doug Brgoch, DWR, Southern Region Commissioner and Water District 16 & 18 Commissioner
Kelley Thompson, DWR, Lead Modeler
Kara Sobieski, Wilson Water Group
Brenna Mefford, Wilson Water Group

Transbasin Diversions

No transmountain diversions are currently imported to or exported from Water District 19. The following four structures, collectively known as the Cuchara Pass Collection System, located on small tributaries on the upper North Fork Purgatoire River have conditional decrees for export to Water District 16. These structures are owned by the Cucharas Sanitation and Water (CSW) District, but to date have not been used.

- Cuchara Pass Collection System A, 30 cfs from Aspen Creek (1900854)
- Cuchara Pass Collection System B, 25 cfs from Beaver Creek (1900855)
- Cuchara Pass Collection System C, 20 cfs from Ogden Creek (1900856)
- Cuchara Pass Collection System C, 30 cfs from Guajatoyah Creek (1900857)

Compacts and Agreements Affecting District 19 Administration

Water District 19 is subject to administration of the Colorado-Kansas Arkansas River Compact, including John Martin Reservoir storage calls and stateline calls which can extend into the Purgatoire River basin. Trinidad Reservoir and the Trinidad Project lands are subject to operation under the Trinidad Operating Principles. Water District 19 is also subject to the Compact Rules Governing Improvements to Surface Water Irrigation Systems (Irrigation Improvement Rules). Note however that off-farm irrigation improvements within the Purgatoire River Water Conservancy District boundary are exempt from the Irrigation Improvement Rules.

Stream Gages

There are 13 currently active streamflow gages in Water District 19, operated by either the USGS or DWR. The gages, station ID, and comments regarding the use or quality of the gages are summarized below. DWR staff indicated that additional streamflow gage data may be available from the Division 2 Hydrographer, Joey Talbott. Available data was requested and incorporated with data available from HydroBase

Purgatoire River at Madrid, CO (07124200)

- Gage used as an indicator of inflows to the Trinidad Reservoir
- The gage record extends back to 1972, six years before the reservoir was constructed

Purgatoire River below Trinidad Lake, CO (07124410)

- Main gage used for DWR and Trinidad Project administration
- Used to verify Army Corp releases from Trinidad Reservoir to satisfy Trinidad Project demands and senior downstream calls

Raton Creek above Starkville, CO (RACRTCO)

- Gage used to check for rainfall events on the mesa that accrue to the Purgatoire River downstream of Trinidad Reservoir
- If a rain event occurs and Raton Creek is high, less water is required to be released from Trinidad Reservoir to meet project demands.

Purgatoire River at Trinidad (07124500)

- Not generally used for DWR administration, used for Trinidad Project administration
- Long term gage with records back to 1896

Purgatoire River at Fishers Crossing (PURFICCO)

- Recently installed however not very accurate, additional maintenance and calibration is necessary
- Gage used for DWR and Trinidad Project administration
- Used to track water destined for Highland Canal and Nine Mile Canal downstream in Division 17, or mainstem Arkansas River calls.

Van Bremer Arroyo near Model, CO (07126200)

- Tributary gage, not generally used for administration

Luning Arroyo near Model, CO (07126100)

- Tributary gage, not generally used for administration
- Data stored as streamflow and administrative flow in HydroBase
- Reflects irrigation return flows from Model Ditch irrigated lands

Purgatoire River near Thatcher, CO (07126300)

- Gage used for administration
- Indicator of streamflow that accrues to the Purgatoire River from tributaries and irrigation return flows, and direct flows passed through the Project reach.
- Gage used to confirm water destined for Highland Canal and Nine Mile Canal downstream in Division 17, or mainstem Arkansas river calls.

Taylor Arroyo below Rock Crossing, near Thatcher, CO (07126325)

- Tributary gage, not generally used for administration

Lockwood Canyon Creek near Thatcher, CO (07126390)

- Tributary gage, not generally used for administration

Red Rock Canyon Creek at Mouth near Thatcher, CO (07126415)

- Tributary gage, not generally used for administration

Bent Canyon Creek at Mouth near Timpas, CO (07126480)

- Tributary gage, not generally used for administration

Purgatoire River at Rock Crossing near Timpas, CO (07126485)

- Gage used to confirm water destined for Ninemile and Highland Canals, or to meet other downstream calls
- Most downstream gage in Water District 19

Instream Flow Reaches

There are four instream flow reaches in Water District 19; the Water Commissioner does not actively administer calls for the reaches due to lack of streamflow gages within the reaches.

- Ricardo Creek (1903001) is decreed for 5 cfs (76W4530) and is located in the far southwest corner of the Water District on a tributary that flows south out of Colorado into New Mexico.
- North Fork Purgatoire River (1903000) is decreed for 5 cfs (77W4632) and is located in the far northwest corner of the Water District upstream of City of Trinidad's diversions to storage in Monument and North Lake Reservoirs.

- South Fork Purgatoire River (1903002) is decreed for between 3 and 18 cfs depending on the season (09CW0088) and is located in the southwest portion of the District upstream of any active irrigation structures.
- Purgatoire River (1903025) is decreed for between 7 and 21 cfs depending on the season (09CW0090) and is located on the mainstem river between the confluences of the North and South Forks of the Purgatoire River with the Purgatoire River amid several active irrigation structures.

General Administration

Jeff Montoya has been the Water Commissioner in Water District 19 for the last 12 years and is assisted by Justin Lucero, the Deputy Water Commissioner.

- The Purgatoire River generally does not have sufficient streamflow to meet the demands of all the users in the basin; therefore there is daily administration in the District.
- Administration in the Water District is generally driven by the Trinidad Project and operates under "internal" calls (i.e. calls within the Purgatoire River as opposed to the mainstem). River calls upstream (west) of the Project are generally set by the Project or, in drier years, by more senior upstream users. Calls downstream of the Project (east) are driven by the Ninemile and Highland Canals in Water District 17 or the mainstem calls. Only in years with above average runoff do the more junior Arkansas River mainstem calls come into priority that may affect calls into Water District 19.
- The daily computed inflow into Trinidad Reservoir provided from the Army Corps is used to set the call above and below the Project and determine water available for the Project. The Raton Creek gage is also reviewed to see if any additional flow is available to satisfy Project users or downstream senior rights. The Water Commissioner coordinates daily with the PRWCD to reconcile the amount of native streamflow available to Project and non-Project users throughout the river.
- Ditches upstream of Trinidad Reservoir are operated mainly by individual water users, whereas ditches below Trinidad Reservoir are operated by ditch companies.
- There are no wells used for irrigation in the Water District, the only high capacity wells in the basin are used by the City of Trinidad for municipal supplies.
- There is significant oil and gas activity in the basin, however production has dropped off recently. Produced water from coalbed methane wells within the District is covered by the Pioneer Augmentation Plan with a maximum depletion of 50 ac-ft. Approximately 40 percent of the area south of the mainstem Purgatoire River has been determined to be non-tributary.
- The Water Commissioner generally visits ditch headgates upstream of the Project weekly or more for measurements, and daily for Project ditches. Some water users also provide diversion records to the Water Commissioner.

Table 1 provides a normal year river call sequence:

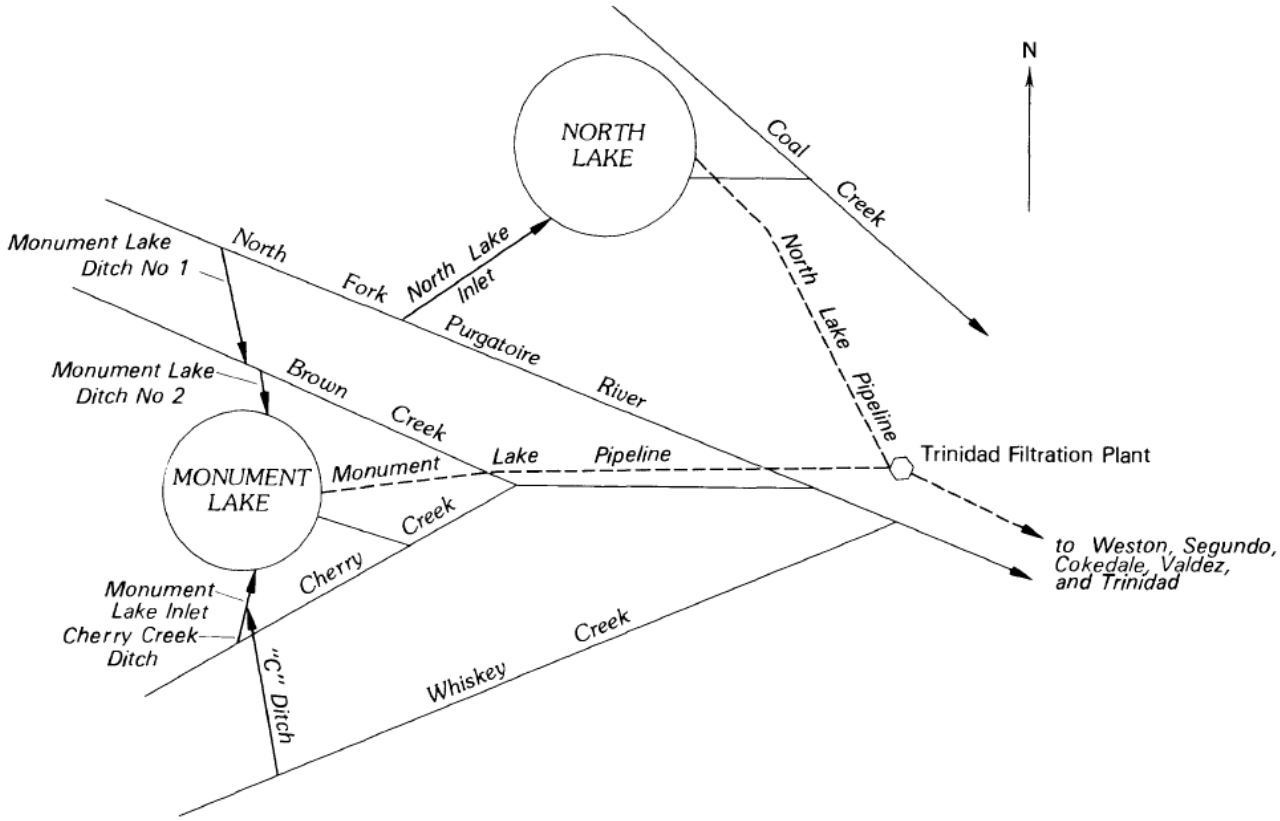
Table 1
Normal Year River Call Sequence

Mid October – March	The irrigation season will generally be over by October 15th and Trinidad Reservoir will begin storing inflow on October 16th under their direct and storage rights into the Irrigation Pool. This continues through April under the 1908 Model Reservoir Priority.
April - July	Irrigation can begin as early as April 1st for some ditches. The Highland Canal (1700615) downstream in District 17 comes on almost immediately and will continue into the summer.
July- Mid-October	Trinidad Project will be declared empty generally around mid-July by the PRWCD and individual Project Ditch rights are administered based on priority and water availability. The Purgatoire River is typically very short and only the most senior water rights in the basin continue to irrigate into August.

Municipal Use

The **City of Trinidad** is the major municipal water provider in Water District 19. Trinidad's primary water supply originates from their mountain collection system located in the upper North Fork of the Purgatoire River, as depicted in Figure 1.

Figure 1: City of Trinidad Mountain Collection System[1]



The original rights associated with the mountain collection system were appropriated around 1905; however the city also diverts more senior water rights transferred from several irrigation ditches including the Long & Suaso Consolidated Ditch (1900517), Gurule Ditch (1900793), Baca Irrigation Ditch (1900783), and Horace Long Ditch (1900516). Releases from North Lake (1903855) and Monument Lake (1903857) are released via pipeline to the Trinidad Filtration Plant for treatment and distribution to their municipal users. The treatment plant is located approximately 2 miles downstream from the lakes and has a capacity to treat approximately 8.4 millions of gallons per day[2]. The city relies primarily on North Lake to meet their potable demands, and generally reserves Monument Lake for drought conditions. In general, supply from the mountain collection system is sufficient to meet the city's potable demand and raw water quality from the system is good.

[1] Source: Description of Water-Systems Operations in the Arkansas River Basin, Colorado (P.O. Abbott, USGS 85-4092)

[2] Source: City of Trinidad's Water Conservation Plan (June 2012, http://ftp.trinidad.co.gov/pages/water_cons/default.html)

In addition to the mountain collection system, Trinidad has a Lower Purgatoire water supply consisting of:

- *Municipal Wells*. Trinidad has five wells decreed to serve non-potable demands throughout the city including parks, cemetery, maintaining levels on Central Park Lake, and ballfields. Of the decreed wells, recent pumping records available from HydroBase indicate the Trinidad City Shop Well (1905503) and Central Park Well (Trinidad Well No. 4, 1905504) have provided approximately 30 acre-feet of supply annually over the past decade; no pumping information is available for the remaining three wells (1905501, 1905502, 1905505). Depletions from the wells are replaced via the Trinidad City Augmentation Plan (1907002).
- *Changed Water Rights*. Trinidad changed senior irrigation water rights under two ditches that historically served irrigated land near the city; 40 percent of the John Flood Ditch (1900572) and 6 percent of the Model Ditch (1900552) in Case No. 88CW061. Subsequent decrees (06CW0078 and 08CW0101) allow those changed shares to be stored in Trinidad Reservoir and to use these changed shares as a replacement supply for the city's augmentation plan (02CW0067 and 11CW0060). Note that currently the city stores the consumptive use portion of the changed shares in Trinidad Reservoir and the return flow obligations are returned to the river at the newly constructed John Flood Ditch/Model Ditch augmentation station (1900772).
- *Storage in Trinidad Reservoir*. The city contracts for 3,000 acre-feet of storage in Trinidad Reservoir in the Joint Use Pool account. The city currently stores their changed water rights and releases them to replace evaporation in the Permanent Pool account and as a replacement supply for the augmentation plan.

The City of Trinidad provides water to approximately 15,000 people, and has a demand of approximately 2,200 acre-feet annually (2011)[3]. There are individuals that live in rural areas outside of the city's service area that haul water for their municipal uses or are served by one of the several pipeline associations that convey treated municipal supplies into surrounding areas. The city's wastewater treatment plant has the capacity to treat 2.0 MGD and discharges to the Purgatoire River downstream of the Chilili Ditch (1900590) headgate. The city has not filed to reuse their effluent or lawn irrigation return flows.

Where to find more information:

- Additional information on the Trinidad Project is included in the ArkDSS Purgatoire River Water Conservancy District Operations memorandum.

[3] Source: City of Trinidad's Water Conservation Plan (June 2012, http://ftp.trinidad.co.gov/pages/water_cons/default.html)

Reservoir Specific Information

North Lake Reservoir (1903855) is owned by the City of Trinidad and is the primary storage facility for the city's water supply. The current dam was constructed in 1964 as a replacement for a smaller, older dam located upstream; the current reservoir now inundates the older reservoir. The reservoir is filled via North Lake Inlet Canal (1900554) and releases are piped directly to the City of Trinidad's water treatment plant. The reservoir's decreed and physical capacity is 4,154 acre-feet including approximately 1,700 acre-feet of inactive storage. The reservoir had been under a storage restriction at the inactive pool level since June of 2011[4], however that restriction has been lifted.

Monument Lake Reservoir (1903857) is owned by the City of Trinidad and used as a secondary storage supply to meet the city's municipal demand. As the reservoir generally remains full, it is used for boating, fishing, and recreation uses. The reservoir is primarily filled via North Lake Inlet Canal (1900554), however also filled from several other ditches including Monument Intake Ditch (1900730), Monument Lake Ditch No. 1 (1900762), Monument Lake Ditch No. 2 (1900623), Cherry Creek Ditch (1900812), Cherry Creek Diversion (1900828), Whiskey Creek Ditch (1900829), and C Ditch and Pipeline (1900831). Note that the diversion records under these structures can be added to reflect the total inflow to the reservoir. Releases are piped directly to the City of Trinidad's water treatment plant. The reservoir's decreed and physical capacity is 1,430 acre-feet.

Black Hills Reservoir (1903782) is an off-channel reservoir that was breached in 2013 by a large rain event. The reservoir, also known as **Model Reservoir (1903797)**, is located approximately 20 miles down the Model Ditch (1900552) and historically served approximately 6,000 acres of irrigated land near the now-abandoned Town of Model. Model Reservoir's 20,000 acre-foot storage right was transferred to the Trinidad Reservoir in 1964; this transfer was pivotal in gaining Federal approval for the Trinidad Project. After the transfer, Black Hills Reservoir filed for a 24,123 acre-foot junior water right for irrigation, of which only 1,303 acre-feet was made absolute and the remainder was abandoned. Black Hills Reservoir contents indicate the reservoir historically stored up to 6,650 acre-feet prior to the transfer of the water rights. Currently, Model Ditch is a participant in the Trinidad Project and conveys water through the historical reservoir site to irrigate approximately 2,000 acres.

Trinidad Reservoir (1903935) was constructed in the mid 1960's and began operations as the key component of the **Trinidad Project** in 1976. It provides flood control, recreation, and irrigation water for ten ditches that serve a combined maximum 19,499 acres in the project area. The reservoir is operated and maintained by the Army Corps of Engineers; the Purgatoire River Water Conservancy District (PRWCD) and Division 2 staff provide administration, accounting, and reporting of project uses. The reservoir is located on-channel just upstream and southwest of the City of Trinidad, and impounds Purgatoire River mainstem water with a

[4] Sourced from DWR North Lake Dam Reservoir Restriction Notification, June 13, 2011.

208 foot high dam[5]. The reservoir has a capacity of 125,967 acre-feet divided into four primary storage accounts:

Table 2: Trinidad Reservoir Accounts

Account Name	Account Volume
Flood Control	51,000 af
Irrigation / M&I	20,000 af
Permanent Recreation / Fishery	15,967 af
Joint Use / Sedimentation	39,000 af
Total	**125,967 af**

Figure 2: Trinidad Reservoir[6]

The outlet structure is capable of releasing up to 5,000 cfs; however releases of project water are generally between 100 to 300 cfs and can be as low as 3 to 5 cfs for stock purposes and delayed return flow obligations in winter months. The reservoir experiences minimal seepage, less than 1 cfs based on streamflow records at the Purgatoire River below Trinidad Lake gage

[5] Source: Purgatoire River Water Conservancy District website (www.PRWCD.org)
[6] Source: U.S. Army Corps of Engineers

during periods when no reservoir releases are occurring. There is an active evaporation pan at the reservoir; accounting on the reservoir reflects gross evaporation less effective precipitation measured at the pan.

Ditches that receive Trinidad Project supplies (Project Ditches) signed contracts to participate in the project, relinquishing control of their direct water rights from April 1st to October 15th each year to benefit the Project (i.e. Project Administration) and receiving Project water in return. PRWCD allocates Project water to the Project Ditches, reflected in Table 3 below, based on the annual irrigated acreage included in their contracts each year. Project Ditches generally submit their full contract amount, which is generally greater than the amount of acreage actually put into production.

Table 3: Trinidad Project Ditches

Baca Irrigation Ditch (1900783)	Model Ditch (1900552)
Picketwire Ditch (1900584)	Johns Flood Canal (1900572)
Chilili Ditch (1900590)	Hoehne Ditch (1900571)
El Moro Ditch (1900596)	Burns & Duncan Ditch (1900585)
Southside Enlarged Ditch (1900598)	Lewelling – McCormick Ditch (1900575)

The daily Project demand is generally greater than 150 cfs; demand is met first from native streamflow and then releases from the Irrigation Pool. Additionally, any irrigation return flows that accrue upstream of the lower Project Ditches, such as Lewelling-McCormick Ditch, become a component of the native streamflow and can be used to meet Project demand. Due to the seniority of the Project Ditch water rights, the Project is generally satisfied from native streamflow if the Purgatoire River call is junior to 1882. Project water from native supplies is pro-rata allocated based on the contract acreage. Once the call on the river is senior to 1882, storage in the Irrigation Pool is released. A minimal transit loss is applied to the Project deliveries; refer to the *Losses and Gains for Eight Unlined Canals Along the Purgatoire River near Trinidad, Colorado, 2000-2004 (USGS Scientific Investigations Report 2006-5164)* for more information on the transit losses and canal losses for the Project Ditches.

Project water in the Irrigation Pool is divided up into two additional accounts; Model Ditch is entitled to up to 6,000 acre-feet of the overall Irrigation Pool account and the other nine Project Ditches are entitled to up 14,000 acre-feet. The Project Ditch storage supplies are pro-rata allocated based on contract acreage, however Hoehne Ditch is entitled to 5,028 acre-feet of total Project supplies (i.e. direct flow and storage) and will generally receive their storage supplies first, particularly in dry years, to meet this set-aside amount. Only Model Ditch can carry over their storage from year to year, any remaining storage available to the Project Ditches gets reallocated to each ditch account in the spring. The Irrigation Pool stores water

under direct Project rights up to the 20,000 acre-foot transferred Model Reservoir 1908 storage right. The Irrigation Pool does not typically fill every year and average years yield between 8,000 and 12,000 acre-feet of storage. Individual Project Ditches are able to call for reservoir releases from their account, however once a single Project Ditch's account in the Irrigation Pool has emptied, PRWCD declares the "Project Empty". Once the Project is declared empty, Project Ditches can continue to divert under their own water rights as they come into priority and call for their remaining storage from the reservoir if available. If Trinidad Reservoir is able to store additional supplies over the summer in the Irrigation Pool, PRWCD can go back into Project Administration. PRWCD declares the end of the irrigation season on October 15th and Trinidad Reservoir will begin to store under its storage rights. In addition to the Model Reservoir right, the reservoir can also store 161 acre-feet under an 1879 right transferred from the Madrid Reservoir and up to 39,000 acre-feet under a 1989 junior water right. Storage will continue through the winter with only minimal releases made for stock purposes and delayed return flow obligations during the storage period.

The Flood Control Pool is designed to impound large flooding events on the Purgatoire River; these events are rare and this account is generally empty. The Permanent Pool serves as a recreation and fishery account in the reservoir. The City of Trinidad is obligated to keep 4,500 ac-ft of the Permanent Pool filled, and uses exchanged transmountain supplies and changed water rights from Model Ditch, John Flood Ditch, and Lopez Ditch to fill this pool. Colorado Parks and Wildlife (CPW) also changed 14 percent of the Model Ditch for storage in the Permanent Pool. The Joint Use Pool is used by three entities: City of Trinidad, CPW, and PRWCD. City of Trinidad has a maximum storage of 3,000 ac-ft in the Joint Use Pool, which the city fills using water supplies from the Lower Purgatoire. The city generally uses these supplies for augmentation purposes. CPW uses their supplies in the Joint Use Pool to store delayed return flows, which are released throughout the winter. In the future, the District will use the Joint Use Pool for more maintenance of delayed return flows as sprinklers begin to be installed. Similar to the Permanent Pool, the storage in the Joint Use Pool is generally limited to the amount supplied by these two sources of water in all but wet years. There is no inactive or dead pool in the reservoir, however the Joint Pool is designed to capture and account for sedimentation in the reservoir. There have been four area/capacity tables developed for the reservoir over the years (original construction, 1994, 1999, and 2009) as a result of this sedimentation issue. On average, sedimentation occurs at a rate of about 200 acre-feet annually.

The Division 2 staff and Army Corp staff perform daily accounting and administration of the Trinidad Project; the Bureau of Reclamation performs the "10-Year Review" process on the operating principles and Project operations. The review is designed to summarize operations and actions related to the Project's Operating Principles, address concerns from state and federal entities concerning the Project operations, and improve overall operations. Reclamation is currently completing the review process for the 2005 -2014 period.

Where to find more information:

- Refer to ArkDSS Task 2.1: Purgatoire River Water Conservancy District memorandum for more information on the Trinidad Project operations.

Tributary Specific Information

The District can generally be divided into two main sections for discussion purposes; tributaries and mainstem upstream of Trinidad Reservoir and the mainstem downstream of Trinidad Reservoir.

Upstream of Trinidad Reservoir

The North, Middle, and South Forks of the Purgatoire are the three main tributaries to the mainstem of the Purgatoire upstream of Trinidad Reservoir. The tributaries contribute approximately 25, 45, and 30 percent of the total flow to the Purgatoire River, respectively.

- North Lake Inlet (1900554): approximately 90 percent of the diversions on the Upper North Fork of the Purgatoire are diverted into North Lake and Monument Lake for municipal uses.
- Several water rights were transferred or changed by Colorado Fuel and Iron (CF&I) Company, Basin Resources, North Central Energy, and Freeport Coal for all uses in the basin. The decrees included an "if and when" term that allows irrigation to continue until other uses begin (primarily for mining and industrial operations), at which point the terms and conditions of the decrees, including dry-up and volumetric limitations, take effect. Division 2 staff developed a map depicting the ditches and water rights involved in these change cases, included as Appendix A.
    - Only limited development of the industrial uses has occurred, most recently associated at the New Elk Mine (1900845 & 1900843). Refer to the map for acreage dried up under individual ditches. Note that in several of these instances, the dried up acreage cannot be reverted back to irrigation if industrial uses cease.
    - Several water rights were transferred or changed for storage in Guajatoyah Reservoir (1903501, W4529), however these were abandoned and the reservoir was never built. As such, the "if and when" conditions for these water rights have also been abandoned and the water rights have reverted back to irrigation uses.
    - Stonewall Reservoirs No. 1 (1903503) and No. 2 (1903504) are proposed reservoirs for storage of these changed/transferred industrial rights but have not been built.
    - Many of these changed/transferred industrial rights include North Lake Reservoir, Monument Reservoir, and Trinidad Reservoir as an alternate point of storage but this operation has not occurred. Storage of these rights in these reservoirs is subject to the City of Trinidad, Reclamation, and PRWCD approval.

- Maxwell Ditch No 1 (1900601): diverts from Abbot Creek and acts as a diversion system with Duling Upper Ditch (1900757).
- Russell & Storz Ditch (1900731) : diverts from Whiskey Creek to irrigate approximately 800 acres and fills Russell Reservoir (1903856)
- Maxwell No. 9 Ditch (1900580): Maxwell No. 13 (1900751), Segundo Ditch (1900763), and A. Storz Ditch No. 2 (1900506) were transferred to Maxwell No. 9 and irrigated lands were dried up as part of the New Elk Mine operation (W4138). Additionally, Antonio Lopez Ditch (1900583) was inundated when Trinidad Reservoir was constructed and its water rights were transferred first to Segundo Ditch and then to Maxwell No. 9. They should be operated as a diversion system.
- Reys Montoya Ditch (1900553): Diverts from the Purgatoire River and operates as a diversion system with Chacon and Espinosa Ditch (1900597).
- Maxwell No. 20 Ditch (aka Consolidated Ditch, 1900522): diverts from the South Fork of the Purgatoire River for irrigation and also for augmentation at the Consolidated Ditch Augmentation Station (1900706). Maxwell Ditch No 19 (1900523) and Alejandro Torres & Vigil Ditch (1900681) should be operated with No. 20 as a diversion system. Changed and transferred shares of Valerio & Torres Ditch (1900670) are turned out at the augmentation station to replace out-of-priority diversions to storage and evaporation on Legends Lake (1903942) under the Hill Ranch Legend Lake Augmentation Plan (1907011).
- Valasquez & Chacon No. 2 (1900513): Changed and transferred shares of Valerio & Torres Ditch (1900670) and Maxwell No. 11 (1900581) are turned out at the augmentation station to replace out-of-priority diversions to storage and evaporation on Legends Lake (1903942) under the Hill Ranch Legend Lake Augmentation Plan (1907011). Records under the Valerio & Torres Ditch reflect the diversions into Legend Lake and irrigation.
- Maxwell No. 15 Ditch (1900734), Maxwell No. 16 Ditch (1900735), and Maxwell No. 17 Ditch (1900736): divert from Whiskey Creek to collectively irrigate approximately 50 acres as a diversion system. Structures are in need of repairs.
- Maxwell No. 7 (1900752), and Maxwell No. 6 Ditch (1900753): divert to serve the same acreage and should be modeled as a diversion system.
- There is limited irrigation along the mainstem of the Purgatoire River upstream of Trinidad Reservoir as the river tends to be very straight with few opportunities to construct diversion structures. Due to volatile streamflows, some structures have washed out which caused a few land owners to practice dry land farming.

Downstream of Trinidad Reservoir

A majority of the irrigated acreage downstream of the reservoir are served by Project Ditches.

- Moran Ditch (1900701) and Jeannin Ditch (1900702): divert from San Francisco Creek to collectively irrigate approximately 470 acres as a diversion system.
- An extensive ditch loss study was performed for eight of the Project Ditches over the 2000 to 2004 period (*Losses and Gains for Eight Unlined Canals Along the Purgatoire*

River near Trinidad, Colorado, 2000-2004 (USGS Scientific Investigations Report 2006-5164). Additionally, the document provides information on the diversion structures and conveyance capacity.

- Johns Flood Ditch (1900572) diversion headgate washed out in the mid 1940's and the water rights were transferred to the Model Ditch (1900552). Although they share a diversion structure, the diversions for each ditch are recorded separately.
    - City of Trinidad has changed 40 percent of John Flood Ditch and 6 percent of Model Ditch for augmentation of municipal uses; CPW has changed 14 percent of Model Ditch for storage in Trinidad Reservoir's Permanent Pool account.
    - A joint Johns Flood/Model Ditch augmentation station was constructed in 2009 just below the headgate to account for the City of Trinidad's and CPW return flow obligations associated with the changed shares in these ditches; the consumptive use portion of the changed shares remain in Trinidad Reservoir.
- Cougar Canon Pump (1900606) and Stoneridge Cougar Canyon Pump (1900555): was historically used to irrigate the Cougar Canyon Golf Course located northeast of the City of Trinidad. There are no decreed water rights at either structure; out-of-priority diversions are replaced from releases from the City of Trinidad's 3,000 acre-foot account in Trinidad Reservoir. The golf course operated from approximately 1999 to 2012. These ditches should be operated as a diversion system.
- Salas North Ditch (1900559): the downstream-most ditch that diverts within Water District 19; not a Project Ditch.

Skelley Ditch (1900565): operates as a diversion system with the O'Neal Ditch (1900682). These ditches are located in the San Isidro watershed, a tributary to the Purgatoire that has its confluence downstream of the Salas South Ditch.

Ninemile Canal (1700604) and Highland Canal (1700615): These two ditches are located on the Lower Purgatoire River over 50 miles below the Salas North Ditch diversion structure. The ditches are administered within Water District 17; however their calls extend upstream into Water District 19.

The dam for Ninemile Canal dams the river and two wasteways are used to bypass streamflow down to satisfy Highland Canal diversions.

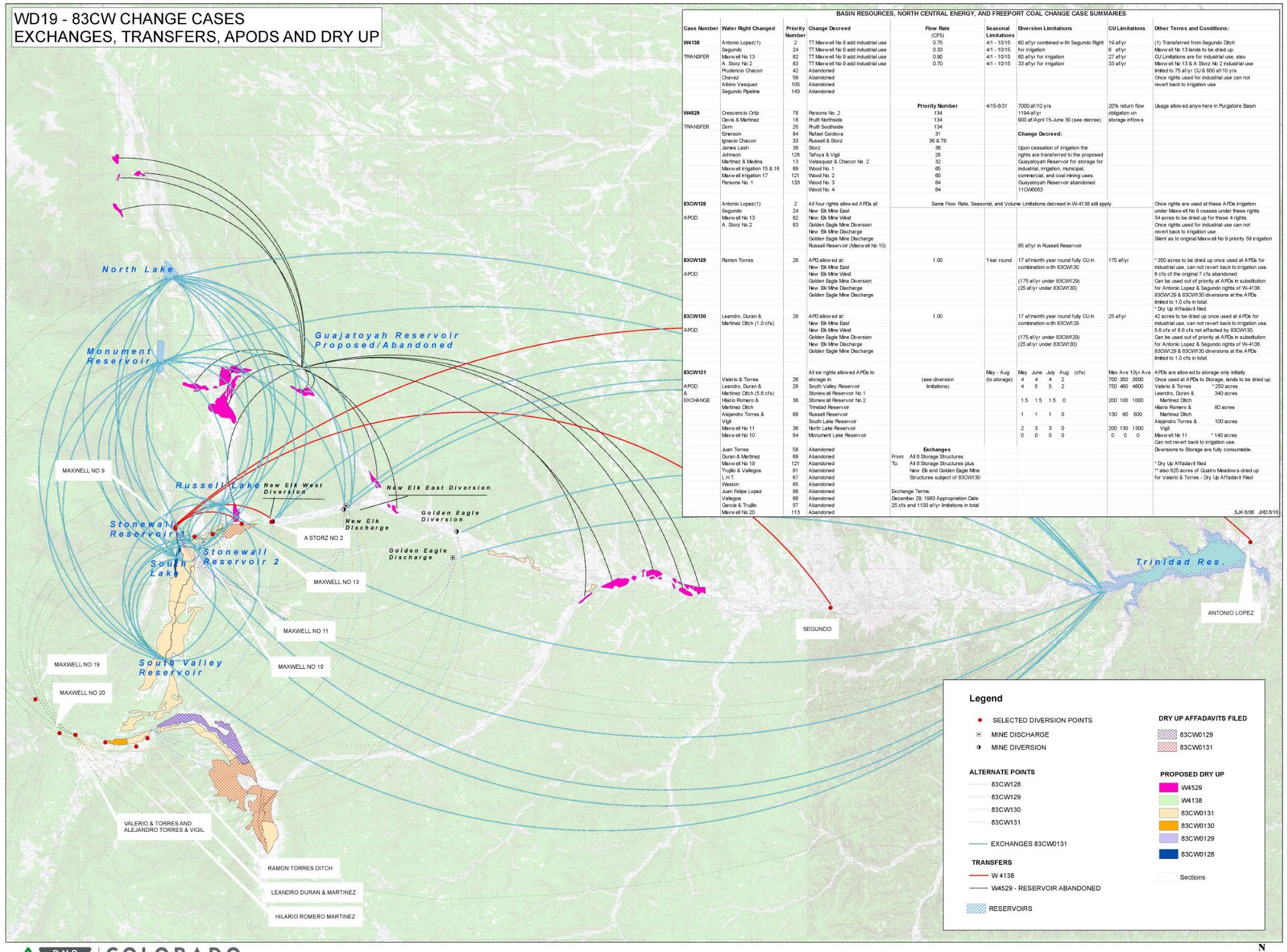
Both ditches operate under futile call conditions when streamflow on the Purgatoire River drops below 8 cfs.

Approximately 90 percent of Highland Ditch has been changed to augmentation purposes under the Lower Arkansas Water Management Association (LAWMA). Augmentation diversions are accounted at the PURHILCO gage (1700900) along with the other LAWMA credits in the river. The remaining water rights total about 2.5 cfs. The use of that water under the canal is limited to May 1 – September 15 due to terms in the LAWMA change case decrees.

Appendix A

Basin Resources, North Central Energy, and Freeport Coal

Change Case Summary and Map - Case No. W4138, W4529, 83CW128, 83CW129, 83CW130, 83CW131



BASIN RESOURCES, NORTH CENTRAL ENERGY, AND FREEPORT COAL CHANGE CASE SUMMARIES

Case Number	Water Right Changed	Priority Number	Change Decreed	Flow Rate (CFS)	Seasonal Limitations	Diversion Limitations	CU Limitations	Other Terms and Conditions:
W4138	Antonio Lopez(1)	2	TT Maxwell No 9 add industrial use	0.75	4/1 - 10/15	60 af/yr combined with Segundo Right	19 af/yr	(1) Transferred from Segundo Ditch
	Segundo	24	TT Maxwell No 9 add industrial use	0.33	4/1 - 10/15	for irrigation	6 af/yr	Maxwell No 13 lands to be dried up.
TRANSFER	Maxwell No 13	82	TT Maxwell No 9 add industrial use	0.90	4/1 - 10/15	60 af/yr for irrigation	27 af/yr	CU Limitations are for industrial use, also
	A. Storz No 2	83	TT Maxwell No 9 add industrial use	0.70	4/1 - 10/15	33 af/yr for irrigation	33 af/yr	Maxwell No 13 & A Storz No 2 industrial use
	Prudencio Chacon	42	Abandoned					limited to 75 af/yr CU & 600 af/10 yrs
	Chavez	59	Abandoned					Once rights used for industrial use can not
	Albino Vasquez	105	Abandoned					revert back to irrigation use
	Segundo Pipeline	143	Abandoned					
				Priority Number	4/15-8/31	7000 af/10 yrs	20% return flow	Usage allowed anywhere in Purgatoire Basin
W4529	Crescencio Ortiz	78	Parsons No. 2	134		1194 af/yr	obligation on	
	Davis & Martinez	18	Pruitt Northside	134		900 af/April 15-June 30 (see decree)	storage inflows	
TRANSFER	Dorn	25	Pruitt Southside	134				
	Emerson	84	Rafael Cordova	31		**Change Decreed:**		
	Ignacio Chacon	33	Russell & Storz	36 & 79				
	James Lash	39	Storz	36		Upon cessation of irrigation the		
	Johnson	128	Tafoya & Vigil	28		rights are transferred to the proposed		
	Martinez & Medina	13	Velasquez & Chacon No. 2	32		Guayatoyah Reservoir for storage for		
	Maxwell Irrigation 15 & 16	89	Wood No. 1	65		industrial, irrigation, municipal,		
	Maxwell Irrigation 17	121	Wood No. 2	60		commercial, and coal mining uses.		
	Parsons No. 1	133	Wood No. 3	84		Guayatoyah Reservoir abandoned		
			Wood No. 4	84		11CW0083		
83CW128	Antonio Lopez(1)	2	All four rights allowed APDs at:	Same Flow Rate, Seasonal, and Volume Limitations decreed in W-4138 still apply.				Once rights are used at these APDs irrigation
	Segundo	24	New Elk Mine East					under Maxwell No 9 ceases under these rights
APOD	Maxwell No 13	82	New Elk Mine West					34 acres to be dried up for these 4 rights.
	A. Storz No 2	83	Golden Eagle Mine Diversion					Once rights used for industrial use can not
			New Elk Mine Discharge					revert back to irrigation use
			Golden Eagle Mine Discharge					Silent as to original Maxwell No 9 priority 59 irrigation
			Russell Reservoir (Maxwell No 10)			85 af/yr in Russell Reservoir		
83CW129	Ramon Torres	28	A/PD allowed at:	1.00	Year round	17 af/month year round fully CU in	175 af/yr	* 350 acres to be dried up once used at APDs for
			New Elk Mine East			combination with 83CW130		industrial use, can not revert back to irrigation use.
APOD			New Elk Mine West					6 cfs of the original 7 cfs abandoned.
			Golden Eagle Mine Diversion			(175 af/yr under 83CW129)		Can be used out of priority at APDs in substitution
			New Elk Mine Discharge			(25 af/yr under 83CW130)		for Antonio Lopez & Segundo rights of W-4138.
			Golden Eagle Mine Discharge					83CW129 & 83CW130 diversions at the APDs
								limited to 1.0 cfs in total.
								* Dry Up Affadavit filed
83CW130	Leandro, Duran & Martinez Ditch (1.0 cfs)	28	A/PD allowed at:	1.00		17 af/month year round fully CU in	25 af/yr	42 acres to be dried up once used at APDs for
			New Elk Mine East			combination with 83CW129		industrial use, can not revert back to irrigation use.
APOD			New Elk Mine West					5.6 cfs of 6.6 cfs not affected by 83CW130.
			Golden Eagle Mine Diversion			(175 af/yr under 83CW129)		Can be used out of priority at APDs in substitution
			New Elk Mine Discharge			(25 af/yr under 83CW130)		for Antonio Lopez & Segundo rights of W-4138.
			Golden Eagle Mine Discharge					83CW129 & 83CW130 diversions at the APDs
								limited to 1.0 cfs in total.
83CW131			All six rights allowed APDs to		May - Aug	May June July Aug (cfs)	Max Ave 10yr Ave	APDs are allowed to storage only initially.
	Valerio & Torres	26	storage in:	(see diversion	(to storage)	4 4 4 2	700 350 3500	Once used at APDs to Storage, lands to be dried up:
APOD	Leandro, Duran &	28	South Valley Reservoir	limitations)		4 5 5 2	750 460 4600	Valerio & Torres * 250 acres
&	Martinez Ditch (5.6 cfs)		Stonewall Reservoir No 1					Leandro, Duran & 340 acres
EXCHANGE	Hilario Romero &	38	Stonewall Reservoir No 2			1.5 1.5 1.5 0	200 100 1000	Martinez Ditch
	Martinez Ditch		Trinidad Reservoir					Hilario Romero & 80 acres
	Alejandro Torres &	68	Russell Reservoir			1 1 1 0	130 60 600	Martinez Ditch
	Vigil		South Lake Reservoir					Alejandro Torres & 100 acres
	Maxwell No 11	36	North Lake Reservoir			2 3 3 0	200 130 1300	Vigil
	Maxwell No 10	84	Monument Lake Reservoir			0 0 0 0	0 0 0	Maxwell No 11 * 140 acres
								Can not revert back to irrigation use.
	Juan Torres	58	Abandoned	**Exchanges**				Diversions to Storage are fully consumable.
	Duran & Martinez	69	Abandoned	From: All 8 Storage Structures				
	Maxwell No 19	121	Abandoned	To: All 8 Storage Structures plus				* Dry Up Affadavit filed
	Trujillo & Vallegos	81	Abandoned	New Elk and Golden Eagle Mine				** also 625 acres of Quatro Meadows dried up
	L.H.T.	67	Abandoned	Structures subject of 83CW130				for Valerio & Torres - Dry Up Affadavit Filed
	Weston	65	Abandoned					
	Juan Felipe Lopez	88	Abandoned	Exchange Terms:				
	Vallegos	66	Abandoned	December 29, 1983 Appropriation Date				
	Garcia & Trujillo	57	Abandoned	25 cfs and 1100 af/yr limitations in total				
	Maxwell No 20	113	Abandoned					SJK 8/06 JHD 6/16

COLORADO
Division of Water Resources
Department of Natural Resources

Date: 6/15/2016

0 0.5 1 2 3 4
Miles

1:50,000

Projection NAD 83 UTM Zone 13N
Base NAIP 2015 Las Animas County

N W E S