

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 16 Meeting
Date: February 2019

Introduction

This memorandum provides notes from August 29, 2017 meeting with Water District 16 Water Commissioner. Water District 16 encompasses the Cucharas River basin upstream of the confluence with the Upper Huerfano River. 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 16 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 Commissioners and the Division Engineer was intended to determine structures that should be considered key based on seniority, water administration, or basin operations. Prior to the meeting, a brief description of the purpose and goals of the

interview was provided to the Water Commissioner, Doug Brgoch. 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

Doug Brgoch, DWR, Southern Region Commissioner and Water District 16 & 18 Commissioner

Kelley Thompson, Division of Water Resources

Kara Sobieski, Wilson Water Group

Brenna Mefford, Wilson Water Group

Transbasin Diversions

No transmountain diversions are currently imported to or exported from Water District 16. The following four structures, collectively known as the Cuchara Pass Collection System, located on small tributaries on the upper North Fork Purgatoire River (Water District 19) 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)

Cucharas Pass Reservoir (1603863) has a 7,000 ac-ft conditional storage right to store transbasin diversions from these structures. The reservoir's decreed location is in the upper reaches of the Cucharas River basin; however it has not been constructed to date.

Compacts and Agreements Affecting District 16 Administration

Water District 16 is subject to administration of the Colorado-Kansas Arkansas River Compact, including John Martin Reservoir storage calls which can extend into the Cucharas and Huerfano River basins. A noted exception, discussed in more detail below, is that Read water rights decreed on the Cucharas River and Huerfano River are senior and not subject to Arkansas River mainstem calls. The Huerfano River may operate under futile call conditions for a portion of the year. Note that an administrative tool is currently under development to assist Division 2 staff in determining futile call conditions using Lower Huerfano River streamflow and river call scenarios. Water District 16 is also subject to the Compact Rules Governing Improvements to Surface Water Irrigation Systems (Irrigation Improvement Rules).

Administration of Read, Killian, and Atwood Water Rights

Water administration in the Huerfano River and Cucharas River basins is primarily driven by three separate decrees, referred to by the judges that signed the decrees:

- **Read Adjudication** (June 12, 1889): Judge Read issued the first adjudication of the irrigation water rights and decreed the first 99 water rights in the Huerfano River basin and the first 70 direct water rights and 3 storage rights in the Cucharas River basin. The appropriation dates for the included water rights ranged from 1862 up to 1889. Judge Read numbered and prioritized the water rights in the decree based on appropriation date (e.g. Priority No. 1 reflects the most senior appropriation date in the decree).
- **Killian Adjudication** (February 23, 1898 continued to October 15, 1901): Judge Killian entered a “supplemental” decree for 225 direct water rights and 22 storage rights in the Huerfano River and Cucharas River basins. The proceedings were continued until 1901 and additional 30 water rights were added to the adjudication. Judge Killian also numbered and prioritized the water rights in the decree based on appropriation date (e.g. Priority No. 1 reflects the most senior appropriation date in the decree), creating the appearance of “competing” priorities with the Read Adjudication.
- **Atwood Adjudication** (October 3, 1921): Judge Atwood entered a “supplemental” decree (Case No. CA1414) for 199 direct rights and 89 storage rights in the Huerfano River and Cucharas River basins. This decree also numbered and prioritized the water rights in the decree based on appropriation date, however started after the last priority decreed in the Killian Adjudication.

Colorado Supreme Court Case No. 9055 (Field v. Kincaid) and No. 11557 (Huerfano County v. Hinderlider) held that:

- water rights in the Read Adjudication are senior to those decreed in the Killian Adjudication, citing the supplemental intent of the adjudication;
- Read water rights cannot be curtailed to satisfy a call on the Arkansas River¹;
- Killian and Atwood water rights are administered based on their appropriation date against calls on the Arkansas River; and
- Killian and Atwood water rights are administered based on their adjudication date within the Cucharas and Huerfano River districts.

Stream Gages

There are three active streamflow gages in Water District 16, operated by either the USGS or DWR. Additionally, Division 2 staff indicated that a new gage will be installed at the Highway 10 crossing, downstream of the Maria-Stevens Reservoir. The gages, station ID, and comments regarding the use or quality of the gage are summarized below.

Cucharas River at Boyd Ranch, near La Veta, CO (07114000)

- Good quality gage, considered to be accurate
- Gage has been active since 1935, only missing five years of data (1988-1992)²
- DWR maintains
- Gage washed out in 2017, needs to be repaired

Cucharas River at Harrison Bridge near La Veta, CO (CRHBLVCO)

- Good quality gage, considered to be accurate
- Main gage used for administration
- Active since 2001 with complete record

Cucharas River below Cucharas Reservoir, CO (CUCBCRCO)

- Records are poor quality
- Gage records available from 1993 – 2010, excluding 2001 and 2002
- Gage was inoperable from 2011 - 2017, recently rehabilitated

Cucharas River at Highway 10, CO (CRHW10CO)

- This new gage was established in 2018

¹ Read water rights cannot be curtailed to satisfy a call on the Arkansas River by virtue of the fact that the Read water rights were held as senior to Killian water rights, and the senior-most Killian water right is senior in priority to downstream Arkansas River mainstem water rights.

² Boyd Ranch gage records are stored as both streamflow and administrative flow in HydroBase

General Administration

- The current Water Commissioner, Doug Brgoch, has managed Water Districts 16 and 18 since 1987.
- There are four Colorado Water Conservation Board (CWCB) decreed minimum instream flow reaches in the basin, located in the upper Cucharas River basin upstream of the Boyd Ranch gage. The instream flow reaches are junior to most other rights and do not typically affect river administration.
- Several water rights in the basin have undergone transfers and changes of use for municipal or augmentation purposes. Transfer of water rights between owners for irrigation purposes has occurred to a lesser degree. Transfers are typically only for a portion of the water right, although in some cases the full water right has been transferred when a ditch headgate became unusable. When water supply is not sufficient to meet the full water right, the shortages are shared among all owners of that priority.
- The Cucharas River generally operates under internal river calls (i.e. calls by water users on the Cucharas River). During average and wet years however, the Arkansas River mainstem calls impact the administration in the basin. Water District 16 is subject to calls from structures located downstream on the Cucharas River but administered in Water District 14, including the Huerfano Valley Ditch (1400657), Pryor Ditch (1400532), and Welton Ditch (1400661). Welton Ditch is the senior downstream calling right (Killian water rights) and may irrigate year round if water is available. The Huerfano River and Cucharas River are basically administered as a single water district with respect to downstream calls.
- In dry years, only the Read Priorities 1 & 3 (originally at Francisco Daigre Mill Ditch (1600628)) are generally in priority.
- Irrigation is concentrated along the Cucharas River mainstem and the Middle Creek and Wahatoya Creek drainages. Water users generally flood irrigate, however gated pipe has become more prevalent over the past 15 years. There are three center pivots in the basin, located near Holita Reservoir.
- Canals in the district are generally 90 percent efficient on average.
- Ditch capacities are generally greater than the maximum recorded diversions and are not a limiting factor on diversions.
- Grass hay is the dominant crop grown in the basin, with limited acreage growing sorghum near Walsenburg.

Table 1 provides a normal year river call sequence:

Table 1
Normal Year Water District 16 River Call Sequence

November to Mid-April	Maria Stevens Reservoir will begin filling in November after irrigation has ended; the storage call will typically go through February. Once Maria Stevens has filled, other reservoirs may fill under futile call conditions through March. Municipal diversions, typically 4 cfs, occur throughout the winter.
Mid-April to July	Irrigation in the lower basin typically begins in mid-April whereas irrigation in the upper basin begins in early-May. Read water rights and the senior Killian rights are typically satisfied during the runoff. First cutting is generally near July 4 th .
July to November	After runoff, the river tends to drop off significantly. By early August, the mainstem flow will be less than 12 cfs and only the Read Priority 1 and 3 are in priority. Depending on monsoonal precipitation, irrigation can extend into November but is generally over by end of November.

Where to find more information:

- Additional information on historical calls is presented in the ArkDSS Task 2.9 Historical Calls memorandum.

Municipal Use

The **City of Walsenburg’s** water rights portfolio includes direct flow rights and storage rights available for diversion and storage at multiple locations. The city’s primary diversion point is the Walsenburg Pipeline (1600637); this pipeline has a 6.9 cfs capacity and is located just upstream of the town of La Veta. The pipeline conveys water into Wahatoya Reservoir (1603723) and Daigre Reservoir (1603720), which have a combined 383 acre-feet total capacity, and continues on to the City Lake (aka Walsenburg Reservoir, 1603724), decreed to store 412 acre-feet. The City Lake serves as a forebay to the city’s water treatment plant. City Lake has been under storage restrictions since 2014, however the city requested funding from CWCB in 2017 for dam rehabilitation and enlargement and that work began in the latter part of 2018. Refer to **Appendix A** for the area/capacity tables for the City’s reservoirs. The city also owns direct flow water rights in the Coler Ditch (aka Lake Miriam Ditch, 1600584) that diverts from the Cucharas River above its confluence with North Abeyta Creek. The Coler Ditch is used to convey water to Horseshoe Reservoir (1603716) and Martin Reservoir (1603715), which combined have a 5,254 acre-feet total capacity. These reservoirs, located within Lathrop State Park, predominantly serve as backup supply for the city during extreme drought periods. The reservoirs are also

used to release small amounts of water to the Cucharas River to meet return flow obligations associated with operations of minority shareholders in the city's changed water rights.

The city's ownership of direct rights is summarized in **Table 2**, summarized by the location the water rights are generally diverted into the city's system. Note that the city has also purchased approximately 58 percent of the remaining 5.605 cfs of the Walsenburg Ditch (1600636) Read Priority No. 5 water right, but has not yet changed the water rights for municipal use in Water Court.

**Table 2
City of Walsenburg Direct Flow Rights**

Ditch	Adj. Date	Approp. Date	Orig. Decreed Amount (cfs)	City Owned/ Changed Amount (cfs)
Walsenburg Pipeline				
Francisco & Daigre Mill Ditch No.1	6/12/1889	5/30/1863	0.80	0.0583
Francisco & Daigre Mill Ditch No.1	6/12/1889	5/30/1863	0.80	0.2917
Calf Pasture Ditch No. 2	6/12/1889	6/15/1863	1.50	0.50
Francisco & Daigre Mill Ditch No. 1 (1st Enl)	6/12/1889	6/30/1864	11.20	0.8120
Francisco & Daigre Mill Ditch No. 1 (1st Enl)	6/12/1889	6/30/1864	11.20	4.0833
Guillen Ditch No. 4	6/12/1889	5/15/1865	2.00	1.00
Guillen Ditch No. 4	6/12/1889	5/15/1865	2.00	0.50
Gomez Ditch	6/12/1889	6/08/1868	3.20	0.533
Gomez Ditch	2/23/1898	4/10/1888	7.00	1.167
Calf Pasture Ditch No. 2	6/12/1889	5/01/1871	1.50	0.50
Walsenburg Pipeline	10/3/1921	5/2/1904	7.00	7.00
Coler Ditch/Lake Miriam Ditch				
Romero Ditch No. 11	6/12/1889	4/1/1869	4.80	0.21
Nate Patterson Ditch No. 35	6/12/1889	5/15/1874	0.70	0.70
Nate Patterson Ditch No. 35 (1st Enl)	6/12/1889	5/10/1875	0.30	0.30
Lake Miriam Ditch No. 52	6/12/1889	3/1/1884	20.00	20.00

The city's current demand is approximately 800 acre-feet annually. The city's lagoon wastewater treatment plant discharges to the Cucharas River just upstream of the Ballejos Ditch (1600571). Planning is underway to construct a new wastewater treatment plant. Division 2 staff recommend the City of Walsenburg be modeled explicitly due to the impact the city's operations have on administration and water availability in the Cucharas River.

Town of La Veta relies primarily on direct flow rights and limited storage rights. The town's water portfolio includes changed irrigation rights in the Francisco Daigre Mill Ditch (0.1 cfs of the Read 1, 1.4 cfs of the Read 3, and 1.48 cfs of the Read 35 transferred at the Spanish Peaks

Ditch); changed irrigation rights in the Mexican Ditch (41 percent of the Read 14 priority); junior water rights at the La Veta Pipeline (1600585); and junior storage rights at the La Veta Town Reservoir (1603717). The La Veta Pipeline diverts water from the Cucharas River and conveys it to La Veta Town Reservoir which serves as a forebay for the adjacent water treatment plant. The town's demand is around 200 acre-feet annually. The wastewater treatment plant discharges to the Cucharas River just upstream of the L.D.R.D. Ditch (1600600).

Cucharas Sanitation & Water District (CS&WD) provides water to the residents in the town of Cuchara and surrounding area near the Dodgeton Creek confluence with the Cucharas River. CS&WD has intakes on Baker Creek (1600707), Dodgeton Creek (1600827), and the Cucharas River (1600825). The district diverts their changed irrigation rights in Calf Pasture Ditch, Walsenburg Ditch, and Ballejos Ditch at these three intake locations. The district also owns and operates Britton Ponds 1, 2, and 3 (1603859, 1603860, 1603861) decreed for a total of 40 acre-feet on the South Fork of the Cucharas River. The 7,000 acre-foot White Creek Reservoir designed to store transbasin diversions from the Cuchara Pass Collection System has not been constructed. Direct rights are generally sufficient to meet the municipal demand and the ponds are not actively used by the district for municipal use.

Reservoir Specific Information

Maria Stevens Reservoir (1603718) is an off-channel reservoir used primarily for private recreational purposes, however it does make limited releases (approximately 1 acre-foot annually) for augmentation of well use by a small subdivision near the reservoir and for irrigation of a small parcel to the north of the reservoir. The reservoir is located on the Lake Maria Grazing Association's ranch to the north of the Cucharas River downstream of the City of Walsenburg. It is the senior storage right in the basin and is filled via the Duran Ditch (1600626). The reservoir was historically two reservoirs, Maria Reservoir and Stevens Reservoir; however the dam between the two was breached to create a single reservoir. There have been multiple area/capacity curves for the reservoir; Division 2 staff indicated that the reservoir contents measured in years 2003 – 2007 were based on an incorrect table and do not reflect the correct contents. The reservoir rarely fills because of its junior storage right. The reservoir experiences significant seepage below the dam.

Antonio D Valdez Reservoir (1603766) is an off-channel reservoir used primarily for livestock purposes. The reservoir is located in the Santa Clara Creek basin and is filled under a junior storage right from diversions via the Antonio D Valdez Ditch (1600806).

Cucharas Valley Reservoir (1603712) is located on the mainstem of the Cucharas. The reservoir was constructed in 1914 and was used historically to make deliveries to Huerfano-Cucharas Irrigation Company (HCIC), including the Huerfano Valley Ditch (1400657) and Huerfano Valley Reservoir (1403821). The dam failed in 1987 prompting DWR to impose a storage restriction to

7,500 feet in 1988. The storage limit was further restricted in 2014 down to zero storage. The dam was dismantled down to the silt level in February 2019 and a channel created to carry the flow of the Cucharas River. During low flows, the silt tends to temporarily “store” streamflow until flows have saturated the silt and streamflow continues downstream.

Lake Miriam Reservoir (aka Lake Horseshoe Reservoir, 1603715) and Lake Oehm Reservoir (aka Lake Martin, 1603716) are located on Lathrop State Park just west and upstream of the City of Walsenburg. The reservoirs are owned by City of Walsenburg as a back-up municipal supply during droughts, but generally operated for recreation. Walsenburg has water level elevation restrictions on the reservoirs to prevent inundation of the surrounding area. A small amount of water is released from the reservoirs to the Cucharas River to augment out of priority depletions and to meet return flow obligations associated with minority shareholder’s operations of the city’s changed water rights. Refer to Appendix A for the area/capacity tables for these reservoirs.

Holita Reservoir (1603713) is located north of the City of Walsenburg near the terminus of the Holita Ditch (1600579). Diversions to storage occur at the Cucharas River via the Walsenburg Ditch headgate (1600636) and conveyed through the Holita Ditch. Holita Reservoir is used for supplemental irrigation, primarily for the Corsentino Dairy, the majority owner in the Holita Ditch and Reservoir. The reservoir’s decreed capacity is 540 acre-feet; however it was under a 360 acre-foot storage restriction that was removed following work on the dam in 2018. Division 2 staff recommend that the off-channel Walsenburg Ditch, Holita Ditch, and Holita Reservoir system be represented explicitly in the model.

Tributary Specific Information

Water District 16 can be divided into two main sections:

- The Upper Cucharas Basin comprising of tributaries and mainstem Cucharas above Lake Miriam Ditch
- The Lower Cucharas Basin comprising of tributaries and mainstem below Lake Miriam Ditch

The Upper Cucharas Basin

Major tributaries in the Upper part of the basin include Middle Creek, Abeyta Creek and Wahatoya Creek. In general, the mainstem produces approximately 13,000 acre-feet annually of native streamflow and the tributaries combined contribute an additional 13,000 acre-feet annually.

- North Veta Canon Ditch (1600896) carries direct diversions for irrigation and diversions to storage in Wright and Brink Reservoir (1603513). There is a 16-mile pipeline from the reservoir that irrigates 230 acres. The ditch has an augmentation station to measure augmentation for well use at the Pinon Hills and Silver Mountain Estates.

- Blundell Ditch (1600829), Frank Martin Ditch (1600830), and Toll Gate Ditch (1600838) divert water from Middle Creek and serve less than 200 acres on the north side of the creek. Represent in the model as a diversion system.
- South Abeyta Highland Ditch (1600870) diverts water from South Abeyta Creek for irrigation and storage in John Owens Reservoir (1603772), Owens Reservoir No. 1 (1603773), and Owens Reservoir No. 2 (1603774). Together the structures serve approximately 230 acres of irrigated land. Represent in the model as a diversion system.
- John Harris Ditch 1 (1600862) and Ditch 2 (1600863) diverts water from South Abeyta Creek for irrigation and storage in C T Ritchey Reservoir (1603771). The reservoir is used as a replacement supply for the Tres Valles Augmentation Plan (1607008) and does not serve any irrigated land. The John Harris Ditches are alternate points to one another and will be represented in the model as a diversion system.
- Highland Ditch (1600883) diverts water from Indian Creek for irrigation and storage in H.R. Carson Reservoir No. 1 (1603776) and No. 2 (1603779). Together the structures serve approximately 80 acres of irrigated land. Represent in the model as a diversion system.
- Butte Ditch (1600574) diverts water from the Cucharas River for irrigation; storage in Butte Reservoir (1603884); and carries water to the Bruce Irrigation & Domestic Ditch (1601010) for irrigation. Diverted supplies are siphoned underneath Bruce Canyon. Note that Vories Reservoir (1603772) stores local runoff in Bruce Canyon and does not receive diverted supplies. Represent in the model as a diversion system.
- Staplin Ditch (1600880) and Landers Ditch (1600877) divert from Staplin Creek to irrigate a combined 50 acres; represent in the model as a diversion system.
- Adam Young Ditch No. 1 (1600788) and No. 2 (1600789) divert from Wahatoya Creek under very junior water rights to irrigate a combined 30 acres; represent in the model as a diversion system.
- Z Half Circle Ditch (1600804 and 1600805) represents the original decreed location and the transferred location under the same ditch name. Combined the ditch system irrigates between 50 and 150 acres depending on water availability. Represent in the model as a diversion system.
- Stevens Ditch (1600881) diverts water from School Creek for irrigation and storage in Stevens Reservoir (1603775). Together the structures serve approximately 30 acres of irrigated land. Represent in the model as a diversion system.
- Spanish Peaks (1600622) diverts water from the Cucharas River for irrigation on acreage that is also served by structures that divert from School Creek and Wahatoya Creek. Spanish Peaks Ditch historically diverted year-round for irrigation purposes but has not in more recent years. Spanish Peak diverts for irrigation under senior water rights transferred from the Francisco Daigre Mill Ditch, a portion of which have been transferred to the La Veta Pipeline (1600585) for municipal use. Structures that are used

as a co-mingled supply (i.e. multi-structure system) with Spanish Peaks Ditch diversions include:

- Homestead Ditch (1600853) – now abandoned
- Hayes Ditch (1600852)
- David Hart Ditch (1600798)
- Ezekial Gribble Ditch (1600801)
- Francisco Daigre Huajato Ditch (1600791) water for this right is now diverted at the Denton & McAuliffe Ditch (1600776); represent in the model as a diversion system.
- Denton Ditch (1600799) diverts water from the Cucharas River for irrigation under an originally decreed Read 20 Priority and under transferred water rights from Dyer Ditch (1600627); Dyer Ditch is no longer usable.
- Francisco Daigre Gran Ditch (1600630) diverts water from the Cucharas River under water rights transferred from Francisco Daigre Mill Ditch; a junior water right; and exchange from the Coler System to irrigate the La Veta Golf Course.
- Francisco Daigre Mill Ditch (1600628) is the most senior ditch in the Cucharas River basin with the Read 1 and 3 Priority water rights and historically irrigated in and around the present-day Town of La Veta. Water has been transferred to multiple locations and some changed for municipal use; therefore much of the historical irrigated acreage has been dried up. Remaining irrigated acreage consists of approximately 120 acres east of the city off of Wahatoya Creek; irrigation occurs year-round. Note that Dyer Ditch () has been used for conveyance of supplies at times. All water users share in the water available to the senior water rights and any shortages. Structures where Francisco Daigre Mill Ditch water rights have been transferred to include:
 - Spanish Peaks Ditch (1600622)
 - Walsenburg Pipeline (1600637)
 - Francisco Daigre Gran Ditch (1600630)
 - La Veta Pipeline (1600585)
- John G Cozad Ditch (1600911) diverts from the Cucharas River for irrigation under water rights transferred from the McCaskill Ditch (1600603) and Cucharas Ditch (1600576). The McCaskill Ditch water rights are limited to irrigation on the east side of the river; Cucharas Ditch water rights can be used on irrigated land on both sides of the river. The limited historical diversions recorded under the Cucharas Ditch reflect diversions at the Cozad Ditch headgate and need to be combined during modeling efforts.
- Calf Pasture Ditch (1600575) diverts from the Cucharas River for irrigation under Read 9, 12, and 59 Priorities that have remained after several transfers. The City of Walsenburg transferred a portion of these priorities to municipal use and diverts them at the Walsenburg pipeline. The acreage associated with these transfers have been dried up. CS&WD transferred Read 1 Priority water rights from Francisco Daigre Mill Ditch to the Calf Pasture Ditch as part of their Phase 1 augmentation plan; diversions under this water right are measured at the augmentation station and turned back to the river.

CS&WD owns additional shares in the Read 9 and 12 Priorities as part of the Phase 3 of their augmentation plan but they have not used these shares to date. Additionally, a portion of the Read 59 Priority was transferred to the Francisco Daigre Gran Ditch for use on the La Veta Golf Course.

The Lower Cucharas Basin

The Lower Cucharas Basin comprises some irrigated acreage and many of the senior priority rights transferred to municipal use.

- Lake Miriam Ditch (aka Coler Reservoir System, 1600584) diverts from the Cucharas River and conveys water to Lake Miriam and Lake Oehm Reservoirs in Lathrop State Park and for limited irrigation along the ditch. There is significant seepage from both the ditch and the lakes. The ditch diverts under its original decreed Read 62 Priority and several transferred water rights including those transferred from Oso Ditch (1600608) and Romero Ditch (1600616) for irrigation and Nate Patterson Ditch (1600584) for municipal purposes. The ditch also serves as an alternate point of diversion for Walsenburg's changed Gomez Ditch water rights. Augmentation releases are made from the reservoir releases, and the augmentation station (Coler Reservoir System Cucharas Delivery Flume, 1600588) is located downstream of the lakes.
- Walsenburg Ditch (1600636) diverts from the Cucharas River for irrigation and carries water for storage in Holita Reservoir (1603713) via the Holita Ditch (1600579). CS&WD changed a small portion of the original Walsenburg Ditch water right and transferred the water right to the Dodgeton Intake structure. The City of Walsenburg owns 58.58 percent of remaining water right at the ditch; although they have not been changed to municipal use to date. Walsenburg Ditch has an augmentation/bypass structure to account for changed water rights.
- Gomez Ditch (1600577) diverts from the Cucharas River for irrigation and storage in Sharps Orchard Reservoir (1603719) and La Joya Reservoir (1603714) under Read 10 Priority and Killian 124 Priority water rights. The structures operate together to serve irrigated acreage on the southeast side of the river; represent as a diversion system in the model. The City of Walsenburg purchased and changed 16 percent of the ditch, dry up of the associated acreage occurred in the 1960's. The changed shares are exchanged to Coler Reservoir and to Walsenburg Pipeline (1600637) with administrative approval. An augmentation station (1600587) is located on Gomez Ditch to measure and turn back augmentation supplies.
- Ballejos Ditch (1600571) diverts from the Cucharas River for irrigation under Read 8 and 13 Priority water rights. A portion of these water rights were transferred to Stonewall Ditch (1600632) in 1931 for irrigation purposes. CS&WD changed a portion of the water rights in the Ballejos Ditch for augmentation purposes and exchanges the shares for storage in Britton No. 1 Reservoir. An augmentation station at Ballejos Ditch measures and turns back the changed shares into the river. Between 6 to 30 acre-feet has been accounted for at the augmentation station, with 70 percent of the diversions exchanged

and stored in Britton No. 1 Reservoir. Note that Ballejo Ditch shares used as augmentation supplies for the Corsentino Dairy were permitted under a temporary SWSP and were not decreed.

- Mexican Ditch (1600604) diverts from the Cucharas River for irrigation under a Read 14 Priority water right. The City of La Veta has changed a portion of the water right for municipal use but has used the changed supply nor dried up the associated acreage. Additionally, Spanish Peaks Village Augmentation Plan (1607003) changed and is currently using 0.02 cfs of the water right for augmentation purposes. Augmentation diversions are measured at a bypass structure on the ditch.
- Santa Clara tributary mainly consists of Read rights and very little of the streamflow reaches the Cucharas River. Structures in this tributary could be accurately represented in an aggregate. A forest fire occurred in the headwaters of the tributary 5 – 10 years ago causing runoff to occur earlier and quicker than historically.
- Bear Creek tributary is similar to the Santa Clara and can also be accurately represented as an aggregate.
- Marchiori Reservoir (1603764) was a historical reservoir located off of Marchiori Ditch (1600845) in the Bear Creek basin. It has filled in with silt and is completely unusable.

Appendix A: Reservoir Area/Capacity Tables

WAHATOYA RESERVOIR GAGE/AREA/VOLUME

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre-feet)	Notes
18	7100	28.73	209.21	spillway
17	7099	27.48	181.10	
16	7098	25.52	154.60	
15	7097	23.43	130.13	
14	7096	21.67	107.58	
13	7095	20.92	86.28	
12	7094	18.27	66.68	
11	7093	16.03	49.53	
10	7092	14.50	34.27	
9	7091	11.45	21.29	
8	7090	7.39	11.87	
7	7089	4.69	5.83	
6	7088	2.21	2.38	
5	7087	1.26	0.65	
4	7086	0.01	0.01	
3	7085	0.003	0.005	
2	7084	0.002	0.002	
1	7083	0.001	0.001	
0	7082	0.000	0.000	outlet invert

source: Wachob & Wachob, Inc. Professional Land Surveyors (per DNR records)

survey date: 2002

DAIGRE RESERVOIR GAGE/AREA/VOLUME

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre-feet)	Notes
18	7057	14.76	173.72	spillway
17	7057	14.55	129.07	
16	7056	14.17	114.71	
15	7055	13.76	100.74	
14	7054	13.00	87.36	
13	7053	11.43	75.15	
12	7052	10.77	64.05	
11	7051	9.97	53.68	
10	7050	8.35	44.52	
9	7049	7.85	36.42	
8	7048	7.30	28.84	
7	7047	6.61	21.89	
6	7046	5.34	15.91	
5	7045	4.99	10.75	
4	7044	3.94	6.28	
3	7043	2.750	2.930	
2	7042	1.550	0.780	
1	7041	0.010	0.005	
0	7040	0.000	0.000	outlet invert

source: Wachob & Wachob, Inc. Professional Land Surveyors (per DNR records)

survey date: 2002

CITY LAKE GAGE/AREA/VOLUME

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre-feet)	Notes
18	6519.93	44.27	479.57	spillway
17	6519	41.75	439.57	
16	6518	39.66	398.86	
15	6517	37.76	360.15	
14	6516	36.00	323.27	
13	6515	34.41	288.07	
12	6514	32.60	254.57	
11	6513	31.01	222.76	
10	6512	29.50	192.51	
9	6511	27.47	164.02	
8	6510	25.12	137.73	
7	6509	22.94	113.70	
6	6508	20.86	91.80	
5	6507	18.80	71.98	
4	6506	16.85	54.15	
3	6505	14.68	38.39	
2	6504	11.63	25.23	
1	6503	8.69	15.07	
0	6502	5.68	7.89	
	6501	3.45	3.32	
	6500	1.60	0.80	
	6499	0.00	0.00	
	6498.88	0.00		

source:Wachob Wachob, Inc.

survey date:August 2008

HORSESHOE (MIRIAM) GAGE/AREA/VOLUME

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre-feet)	Notes
22.5	6445.45	161.98	2177.13	spillway
22.0	6445	160.72	2104.53	
21	6444	157.79	1945.27	
20	6443	154.53	1789.11	
19	6442	150.26	1636.72	
18	6441	143.56	1489.81	
17	6440	137.25	1349.40	
16	6439	131.02	1215.27	
15	6438	124.81	1087.35	
14	6437	118.88	965.51	
13	6436	113.36	849.39	
12	6435	107.99	738.71	
11	6434	102.02	633.71	
10	6433	95.90	534.75	
9	6432	89.63	441.98	
8	6431	82.22	356.06	
7	6430	74.10	277.90	
6	6429	64.96	208.37	
5	6428	54.49	148.64	
4	6427	44.46	99.17	
3	6426	34.81	59.53	
2	6425	24.01	30.12	
1	6424	8.38	13.93	outlet invert
0	6423	41.10	7.68	
	6422	3.03	4.11	
	6421	1.97	1.61	
	6420	0.75	0.25	
	6419.33	0.00		

source:Wachob Wachob, Inc.

survey date:August 2008

2010 New MARTIN (OEHM) GAGE/AREA/VOLUME

Total Water Capacity

Usable Water Capacity

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre- feet)	Notes
23.11	6405.14	189.73	3076.69	Spillway at 6405.14'
22.97	6405	188.86	3050.19	
21.97	6404	183.82	2863.84	
20.97	6403	179.11	2682.38	
19.97	6402	174.21	2505.72	
18.97	6401	168.98	2334.12	
17.97	6400	162.86	2168.2	
16.97	6399	157.06	2008.24	
15.97	6398	151.21	1854.1	
14.97	6397	145.17	1705.92	
13.97	6396	139.5	1563.58	
12.97	6395	133.97	1426.85	
11.97	6394	128.52	1295.6	
10.97	6393	121.75	1170.47	
9.97	6392	116.24	1051.47	
8.97	6391	110.99	937.86	
7.97	6390	105.5	829.61	
6.97	6389	100.49	726.62	
5.97	6388	95.21	628.76	
4.97	6387	90.94	535.69	
3.97	6386	83.06	448.69	
2.97	6385	75.54	369.39	
1.97	6384	69.9	296.67	
0.97	6383	64.1	229.67	Outlet structure at 6382.03'
-0.03	6382	58.03	168.61	
-1.03	6381	50.92	114.13	
-2.03	6380	41.47	67.94	
-3.03	6379	30.02	32.19	
-4.03	6378	14.62	9.87	
-5.03	6377	2.7	1.22	
-5.93	6376	0	0	

Gage (feet)	Elevation (feet)	Surface Area (acres)	Volume (acre- feet)	Notes
23.11	6405.14	189.73	2745.05	Spillway at 6405.14'
22.97	6405	188.86	2718.55	
21.97	6404	183.76	2532.24	
20.97	6403	179.11	2350.81	
19.97	6402	174.21	2174.15	
18.97	6401	168.98	2002.55	
17.97	6400	162.86	1836.63	
16.97	6399	157.06	1676.67	
15.97	6398	151.21	1522.53	
14.97	6397	145.17	1374.35	
13.97	6396	139.5	1232.01	
12.97	6395	133.97	1095.28	
11.97	6394	128.52	964.03	
10.97	6393	121.75	838.89	
9.97	6392	116.24	719.9	
8.97	6391	110.99	606.29	
7.97	6390	105.5	498.04	
6.97	6389	100.49	395.05	
5.97	6388	95.21	297.19	
4.97	6387	90.94	204.12	
3.97	6386	83.06	117.12	
2.97	6385	75.54	37.82	
1.97	6384	0.04	0.03	
0.97	6383	0.01	0	Outlet structure at 6382.03'
0	6382.03	0	0	