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Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Alexander Funk, Agricultural Water Resources Specialist
Interstate, Federal, and Water Information Section

DATE: 1/17/2020

AGENDA ITEM: 21. Colorado Springs Utilities Fallowing-Leasing Pilot Project

Attachments:

Pilot Project Application
Pilot Project Application Comments
Joint Conference Report
Determination of the State Engineer
Division of Water Resources Dry-land Farming Memo

Background:

The Lower Arkansas Valley Super Ditch Company ("Super Ditch") and the City of Colorado Springs, acting by and through its enterprise, Colorado Springs Utilities ("Colorado Springs") (collectively the "Applicants") submitted a formal proposal to CWCB staff for the Colorado Springs/Super Ditch Pilot Project ("Pilot Project"). The proposal followed a selection and approval process by the Board at its March 2019 meeting in Fort Collins. The Pilot Project falls under the umbrella of House Bill 13-1248 and the *Criteria and Guidelines for the Fallowing-Leasing Pilot Program in Colorado* ("Criteria and Guidelines").

The Pilot Project involves transfers from certain shares of agricultural water from farmland irrigated by the Catlin Canal, within Otero County, for temporary municipal uses by Colorado Springs. The Applicants developed the Pilot Project to demonstrate the viability of the fallowing-leasing concept on a larger scale and to provide water to Colorado Springs for drought recovery without the need for permanent dry-up of irrigated agriculture, which can cause significant economic hardship for rural communities. If approved, the Pilot Project operations would be in March 2020 through March 2030. The Pilot Project would involve the temporary fallowing of fields in three out of ten years with no more than 3,000 acre-feet of consumptive use water transferred to Colorado Springs over the ten year period.

HB13-1248 CWCB Board Consideration Process:

House Bill 13-1248 and the Criteria and Guidelines set out the process for the CWCB Board to consider proposed Pilot Projects. Following the selection of a Pilot Project proposal, Applicants must submit a detailed Pilot Project application (attached). The detailed Pilot project application was submitted on August 16, 2019. A 60-day comment period followed, ending on October 15, 2019. Comments were received from Pueblo West Metropolitan

District, Lower Arkansas Water Management Association, Tri-State Generation and Transmission Association, Inc. ("Tri-State"), Southeastern Colorado Water Conservancy District, and Five Rivers Cattle Feeding LLC ("Colorado Beef").

Pursuant to the Criteria and Guidelines, a conference meeting was conducted on November 6, 2019, in Pueblo, Colorado, for the purposes of discussing the Pilot Project application. The conference meeting was attended by the applicants, the State Engineer, and owners of water rights or contract rights to water who filed comments on the Pilot Project application. Following the conference meeting, a Joint Conference Report was prepared and submitted to the State Engineer and CWCB on November 21, 2019. The Joint Conference Report was circulated to all conference participants, along with representatives from Tri-State and Kansas.

Following the application submission process above, the State Engineer, in preparing a written determination, considered the Pilot Project application, comments received, and the Joint Conference Report, which identified a large number of agreed-upon terms and conditions as well as some terms and conditions where some disagreement remained. The State Engineer issued a favorable written determination on December 6, 2019. The Determination of the State Engineer was prepared with terms and conditions to ensure that the Pilot Project will result in only a temporary change in the historical consumptive use of the water right in a manner that will not cause injury to other water rights, decreed conditional water rights, or contract rights to water and that the project will not impair compliance with the Arkansas River interstate compact.

Based on the favorable Determination of the State Engineer, this Board may, in its discretion, approve the pilot application, adopting all terms and conditions recommended by the State Engineer, in addition to terms and conditions adopted by the Board at its discretion. Based on the issues outlined below, CWCB staff is recommending the adoption of one additional term and condition.

Issues Raised in Joint Conference Report and Determination of the State Engineer

Correspondence and discussions continued between DWR, CWCB ("the State"), and the Applicants about two issues after the issuance of the State Engineer's Determination: dry-land farming (Determination condition B1) and the use of irrigation return flows by the Applicants (Determination condition B12). Both of these issues are described in further detail below.

Use of return flows

Applicants are concerned that condition B12 differentiates return flows and transferrable consumptive use in a manner that may impact their ability to deliver water to Colorado Springs for municipal use. This differentiation may require exchanging the return flow portion of Catlin Canal shares to Pueblo Reservoir with a junior priority and requires an administrative approval for the use of return flow water for municipal use, even though Colorado Springs will replace return flows to the river using other sources of water, preventing injury to other water users.

The State Engineer considers that, during a year of operation, the water returned from the Catlin Canal to the Arkansas River is either (1) changed historical consumptive use, (2) surface return flows owed to the stream the day of delivery, (3) groundwater return flows owed to

the stream at a later date. In accordance with the Application, the historical consumptive use and groundwater return flows will be exchanged to Pueblo Reservoir. Although Applicants requested to use the return flow portion for their municipal use as part of the Pilot Project and replace return flows with supplies, the State does not have the authority to approve a change of use of the return flow portion of share deliveries because return flows are part of the stream system available to water users in priority.

The State clarifies in this memo that condition B12 requires administrative approval, which can be granted via correspondence with the Division Engineer, to use return flow water for municipal use. Colorado Springs may replace return flows using water approved for such use without any separate approval.

Dry-land farming

The Determination of the State Engineer for the Pilot Project contemplated disputed terms and conditions related to dry-land farming on fallowed fields. Dry-land farming of winter wheat and other crops helps prevent soil erosion on fallowed fields while providing some potential income for the producer.

The comments from Lower Arkansas Water Management Association (LAWMA) (October 2019) requested that in order to prevent injury, the applicants should estimate the amount of soil moisture depleted by dry-land farming and deliver an equal amount to the Arkansas River at the Timpas Creek confluence during the month of April when the parcel is re-irrigated. This argument is based on the understanding that dry-land farming may deplete soil moisture on a field more than fallowing the land, such that when a field is re-irrigated, additional irrigation water is consumed after dry-land farming compared to fallow. If additional consumption of irrigation water occurs during re-irrigation, there is potential for injury.

From a direct reading of the HB1248 Pilot Project statute, it is not clear if dry-land farming was contemplated to occur with fallowing. Section 37-60-115(8), CRS describes that the intent of the Pilot Project program is to demonstrate the practice of temporarily "fallowing irrigated agricultural land." However, HB1248[1] describes goals to learn more about temporary fallowing operations. An investigation into the potential impacts of dry-land farming in Pilot Projects will provide knowledge to Colorado water users and the CWCB, which is in line with the learning spirit of the legislation. Appendix B of the Criteria and Guidelines, Administration of Dry-Up Parcels, does specifically mention dry-land cover crops. Therefore, CWCB and DWR conclude that dry-land farming is not precluded by the HB-1248 Pilot Project program.

Concerns about injury and the consideration that dry-land farming was contemplated within the streamlined method required by the Criteria and Guidelines were both discussed during the conference in November 2019. The parties agreed that the Applicant would model the potential for injury using the specific farms and shares in the Pilot Project prior to issuance of the Determination.

[1] 37-60-115(8), CRS includes the following statements regarding the purpose of the pilot program, "evaluate the feasibility of delivering leased water," "provide sufficient data...can evaluate the efficacy of using a streamlined approach", "demonstrate how to operate, administer, and account..."

Applicant and DWR Dry-land Farming Modeling Results:

The Applicants supplied a memo on November 27, 2019, that determined the additional depletions to soil moisture that occur when (a) dry-land farming (based on winter wheat) is compared to (b) fallow ground. The results show that there is a potential for the soil moisture depletion of dry-land farming on the subject parcels to cause impacts. But the potential impacts from dry-land farming on soil moisture depletion are highly variable year to year and would depend on several factors including climatic conditions, soil conditions prior to the dry-land farming, and if dry-land farming occurs for consecutive years. If dry-land farming occurs three years in a row, the potential for injury only occurs once, in the year the land is re-irrigated. The impacts are not cumulative, and the amount of impact is limited by the finite volume of storage space within the crop root zone. The applicants showed that in total for the three years modeled, the extra consumption of subsequent irrigation water after dry-land farming is less than the total conservatism of the HB1248 model assumptions (compared to the H-I Model) underestimate of transferable consumptive use. The underestimate of HB1248 streamlined method transferrable consumptive use results in extra return flow water in the stream during the fallow year.

As described in condition B1, DWR did not have enough detail about potential impacts from dry-land farming to include a term and condition on the topic. DWR completed additional modeling and circulated the results to the parties on December 20, 2019 (attached). The modeling considered each year between 1951 and 2017 and each parcel. It compared transferrable consumptive use using HI-Model assumptions and HB1248 assumptions, showing that the conservatism is variable on different farms and in different years. The differences in the amount of soil moisture in March after a dry-land crop, fallow, or normal irrigation were also modeled to vary greatly on different farms and in different years. Soil moisture differences between irrigated, fallow, and dry-land farming were minimal in the spring following a "very dry" year (as indicated by low diversions to the Catlin Canal). Conversely, potential impacts from dry-land farming were modeled to be the highest in the spring following a wet year where Catlin Canal diversions were greater than normal.

The Applicants supplied a follow-up modeling memo on January 7, 2020. This memo added to the earlier analysis the consideration that Catlin Canal shares could yield an amount of transferable consumptive use greater than 1,000 acre-feet in a year. Depending on many factors, it is possible that some of the transferrable consumptive use water could not be used for municipal purposes and would be released to the Arkansas River, creating a windfall for water users.

Recommended Term and Condition for Dry-land Farming:

Due to the complexity of soil moisture conditions, and a lack of on-the-ground information about this issue, a scientific field study of soil moisture comparing nearby dry-land farms, fallowed farms, and normally irrigated farms (potentially with different dry-land crops) would be a useful undertaking during operation of the Pilot Project by a qualified third-party, such as a university. These results would not impact the operations of this Pilot Project but could inform Colorado's efforts to investigate alternative transfer methods, including temporary fallowing.

The study would measure the soil moisture at several depths throughout the root zone (i.e., 0.5,1-4 feet) at several representative locations within each dry-land cropped field, as well as

at several fallow fields and several normally-irrigated fields that are on the participant's farm or nearby. At a minimum, the soil moisture would be measured at the start of the year of fallowing/dry-land cropping as well as just prior to re-irrigation of those fields (i.e., if using manual measurement) although at least some continuous measurement throughout that period with logging sensors would also be valuable.

Further, Applicants' accounting and reporting should document the amount of transferable consumptive use that is not used for a municipal purpose and is released to the Arkansas River. Applicants should document why the water could not be used, for instance, lack of storage space or lack of exchange potential. Applicants should also consider if it would be feasible to make releases of water to the Arkansas River at Timpas Creek in the April when re-irrigation occurs as suggested by LAWMA or if such operation would hinder Pilot Project operations or yield.

Based on the above, CWCB staff is recommending the following additional term and condition:

Applicants, during the operation of the Pilot Project, shall conduct a scientific field study to determine the potential effects of dry-land farming on soil moisture depletions and any likely associated impacts to other water users upon re-irrigation. Applicants shall work cooperatively with CWCB and DWR in developing a scope of work and selecting an appropriate contractor to perform the study. Study findings shall be described in Applicant's annual reports as required by term and condition 44 of the Determination of the State Engineer. Further, Applicants shall account and report on any transferable consumptive use that is not used for a municipal purpose and why.

Staff Recommendation:

Staff recommends that Board (1) approve the Pilot Project based on the Determination of the State Engineer, including terms and conditions necessary for project operation and administration, that the Pilot Project can operate without causing injury and without impairing compliance with any interstate compact and (2) adopt the additional term and condition regarding dry-land farming.

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August 16, 2019

Ms. Megan Gutwein
Berg Hill Greenleaf Ruscitti LLP
1712 Pearl St
Boulder, CO 80302

Re: HB 13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project
Use of Catlin Canal Shares by City of Colorado Springs

Dear Ms. Gutwein:

This letter report provides the information required for the Colorado Springs/Super Ditch Pilot Project ("Pilot Project") application being filed on behalf of the Lower Arkansas Valley Super Ditch Company (Super Ditch) and the City of Colorado Springs, acting by and through its enterprise, Colorado Springs Utilities (Colorado Springs),[1], which proposes the use of certain shares in the Catlin Canal Company as a source to provide a temporary municipal supply for Colorado Springs during the requested ten-year pilot project approval period. This application is being filed per selection by the Colorado Water Conservation Board of the November 16, 2018 HB 13-1248 Colorado Springs Utilities Pilot Project Proposal for CWCB Selection, and to fulfill obligations in the attached Fallowing-Leasing Project Agreement By and Between The Lower Arkansas Valley Super Ditch Company and The City of Colorado Springs, Acting By and Through Its Enterprise, Colorado Springs Utilities ("Super Ditch and CSU Contract").

Colorado Springs has contracted for up to 1,000 acre-feet of consumptive use water annually in three out of the ten years of the Pilot Project. A total of 1,572.726[2] shares and 1,791.1 acres are included in the Pilot Project. Water delivered to Colorado Springs will be derived from fallowing a maximum of 635 shares and 622 acres in any one year. The water will be diverted by the Catlin Canal and, minus ditch and lateral losses, returned to the Arkansas River via one or more augmentation stations. The deliveries to the Arkansas River will include replacement of tailwater return flows and lagged deep percolation return flows resulting from the current irrigation season's deliveries. Remaining consumptive use water and excess deep percolation water will be exchanged to Pueblo Reservoir if exchange potential is available. Step exchanges may also be utilized to deliver

[1] The Super Ditch and Colorado Springs may sometimes be referred to herein collectively as the "Applicants."
[2] An average of 300 shares leased from the Colorado Division of Parks and Wildlife ("CPW") that was used on this Pilot Project acres is not included in this application. The method by which the CPW shares were excluded from the historical use analysis, and thus this application, is described below.

the remaining consumptive use water and excess deep percolation water to intervening structures in the event direct exchange to Pueblo Reservoir is not possible. The water exchanged in a step exchange may be stored until such time as exchange potential to Pueblo Reservoir is available. Consumptive use water will be exchanged per the exchanges decreed in Case No. 10CW04 decreed in Division 2 Water Court or administrative exchange, and deep percolation will be exchanged per administrative approval. Colorado Springs may use up to approximately 1,815 acre-feet of water each year for up to three years during the 10-year term of the Pilot Project to provide water to replenish water supplies during or after a drought. Up to 1,000 acre-feet of the total will be consumptive use water, and the remainder will be deep percolation return flow water. Per the attached Letter Agreement concerning the Replacement of Return Flows for the CS-U/Super Ditch Pilot Project ("Letter Agreement") dated August 16, 2019, Colorado Springs will replace lagged deep percolation return flow obligations with the deep percolation return flow water exchanged to Pueblo Reservoir or other fully consumable water available in Pueblo Reservoir, at the confluence of Fountain Creek and the Arkansas River, or from Lake Meredith, as described in Section II.E (page 12) of this application.

This report satisfies Section II.G, Information to be Included in a Pilot Project Application of the Criteria and Guidelines for Fallowing-Leasing Pilot Projects (Criteria and Guidelines). This report includes information on 1,857.8 shares used on the participating farms, 635 shares (Subject Shares) of which will be used for the proposed operation of the Pilot Project. Version 7 of the Lease-Fallowing Tool (LFT), provided by the Division of Water Resources was used to complete the historical use analysis of the subject farms.

The Catlin Canal diverts from the Arkansas River approximately 44 miles, as the crow flies, downstream of Pueblo Reservoir, or nearly 61 miles as a stream distance. The canal is approximately 35 miles long, diverting from the Arkansas River 4.1 miles east of the Town of Fowler and terminating on Crooked Arroyo about 5.4 miles west-southwest of the City of La Junta. The following table describes the water rights owned by the Catlin Canal Company, all of which are decreed for irrigation use.

Table 1
Catlin Canal Company Water Rights

Water Right	Priority No.	Appropriation Date	Adjudication Date	Amount (c.f.s.)
Catlin Canal	2	04/10/1875	04/08/1905	22.0
Catlin Canal	5	12/03/1884	04/08/1905	226.0
Catlin Canal	7	11/14/1887	04/08/1905	97.0

Additionally, the Catlin Canal diverts water attributable to the Winter Water Program decreed in Case No. 84CW179. It also diverts Frying Pan-Arkansas Project water (Fry-Ark Project Water), but the Fry-Ark Project water is not included in the Pilot Project.

The Colorado Springs/Super Ditch Pilot Project utilizes direct flow and stored water native to the Arkansas River Basin and derived from shares in the Catlin Canal Company. As such, proposed operation of the Pilot Project during its ten-year term will not involve any transfer or facilitation of transfer of water across the Continental Divide by direct diversion, exchange, or otherwise, nor

does it involve the transfer or facilitation of transfer of water out of the Rio Grande Basin by direct diversion, exchange or otherwise.

I. Historical Use Analysis

The Catlin Canal Company has a total of 18,660 outstanding shares. The decree in Case No. 06CW049 states that the Catlin Canal priorities have been used to irrigate between 17,000 and 18,660 acres of land. Per the results of GIS data and as reported in HydroBase, 15,877 acres were irrigated by surface water via the Catlin Canal in 2003. As such, based on the 2003 GIS data and the decree, respectively, one Catlin share has historically served an average between 0.85 acre to 1.0 acre.

A. *Participating Farms*

The Colorado Springs/Super Ditch Pilot Project will use shares that historically irrigated lands located on the Diamond A, Schweizer, Mameda, Groves and Mayhoffer Farms (see Figure 1, Colorado Springs/Super Ditch Pilot Project Area Map, Appendix A) (Participating Farms)[3]. As described below, in 2015 the Participating Farms used a total of 1,857.726 shares to irrigate 1,791.1 acres, which equates to an average of approximately 1.085 acres per share. Average irrigation for the thirty-year study period from 1988 through 2017 was 1,701.65 acres for the Participating Farms. Table 2 below provides a legal description of the historically irrigated acres, the irrigated acreage in 2015, the historical irrigated acreage, the Pilot Project historical irrigated acreage[4], the number of shares for the above participating farmers, the number of leased Colorado Division of Parks and Wildlife (CPW) shares used on the historically irrigated acreage, the acres per share, and associated share certificate numbers.

As shown in Figure 1, the Schweizer and Diamond A Farms are located about 3.3 miles east-southeast of the Town of Manzanola along State Highway 50; the Mameda Farm is about 6.7 miles southeast of the Town of Rocky Ford; the Groves Farm is located about 4.8 miles south-southeast of the Town of Rocky Ford; and the Mayhoffer Farm is located 3.4 miles south of Swink.

[3] Two minor discrepancies between the original proposal description of land are corrected in this application. 1) Some of the maps for the Diamond A farm were omitted; and 2) Mameda Farms and share information was omitted while the maps were included.

[4] This Pilot Project historical irrigated acreage is the historical irrigated acreage proportionally reduced to factor out the historical use of leased CPW shares since the CPW shares are/were leased, rather than owned, by the participating farmers.

Table 2
Historically Irrigated Lands

Participating Farmer	Legal Description of Historically Irrigated Lands	Irrigated Acreage (2015)	Historical Irrigated Acreage[1]	Pilot Project Historical Irrigated Acres[1]	Number of Participant Shares	CPW Shares	Total Number of Shares	Shares per Acre[1]	Participant Associated Share Certificates
Diamond A	Portions of Sections 20, 28, 29, 30, 31, 32, and 33, T22S, R57W of the 6th P.M., Otero County, Colorado	1123.7	1080.73	860.63	1,087.010	278.000	1,365.010	1.263	16, 18, 21, 22, 3604, 3712
Schweizer	Portions of the E1/2 and NW1/4 of Section 5, T23S, R57W of the 6th P.M., Otero County, Colorado	212.2	206.21	206.21	195.476	0.000	195.476	0.948	91, 3493, 3498, 3703
Mameda	Portions of Section 11, T23S, R57W of the 6th P.M., Otero County, Colorado	157.6	152.33	152.33	99.000	0.000	99.000	0.650	42, 43
Groves	Portions of the SE1/4 of Section 5, portions of the NW1/4 of Section 3, and portions of Section 4, T24S, R56W of the 6th P.M., Otero County, Colorado	262.4	230.24	197.73	156.240	22.000*	178.240	0.790	2, 3, 4, 5
Mayhoffer	Portions of the NW1/4 of Section 18, T24S, R55W of the 6th P.M., Otero County, Colorado	35.2	32.15	32.15	35.000	0.000	35.000	1.089	3663
Total	-	1791.1	1701.65	1,449.0	1,572.726	300.000	1872.726	1.085	-

[1]Average for relevant study period. The CPW shares were factored out of the historical consumptive use analysis by proportionately reducing the Pilot Project Historical Irrigated Acres to that irrigated only with the participant shares.

*Groves leased 30 CPW shares for 22 years of the 30-year study period. The average of 22 shares per year is used for the purposes of this table.

B. Methodology

The historical consumptive use of the Catlin Canal Company water rights per share was determined using the criteria specified in Section II.G of the Criteria and Guidelines, via Version 7 of the LFT, which may be accessed at an ftp site included in the instructions at the end of this report. The presumptive factors used in the historical use analyses are as follows and are included in Table 36 in each of Appendices B through F.

Farm Efficiency - 55%
Soil Moisture – 6 inches (root depth of 4 feet, AWC 12.5%)
Surface Water Return Flows – 20% of the return flow fraction
Ground Water Return Flows – 80% of the return flow fraction

Other factors used in the historical use analyses are as follows:

Ditch Loss – 10.4309% per HI Model
Off-Farm Lateral Losses – 3.5% per HI Model

The Criteria and Guidelines also require the use of the Modified Blaney-Criddle with TR-21 crop coefficients, use of the weather station nearest to the headgate, 30 years of diversion records, cropping patterns based on county cropping records, use of the USBR effective precipitation method, and an aerial photograph from each decade used in the analysis. The LFT provides for the first five criteria, with the study period for the Participating Farms consisting of the most recent period from which diversion records are available (1988 through 2017). Note that the LFT designates the Rocky Ford 2 SE weather station as that nearest the headgate, and that the diversion records therein include only deliveries of native and winter water. It is our understanding that the county cropping patterns used in the model are peer reviewed on an annual basis by personnel from both Kansas and Colorado.

C. Historically Irrigated Acreage

CDSS mapping was reviewed to develop irrigated acreage for the Participating Farms (Division 2 Irrigated Lands Shapefiles[5]). Aerial photographs for all of the Participating Farms obtained for the years 1988, 1998, 2005 and 2011 are included in Appendix A as Figures 2 through 21. No notable discrepancies were found between CDSS mapping and our aerial photograph delineations. The irrigated acreages identified on the aerial photographs are reported in Table 3 below.

[5] Available at https://www.colorado.gov/pacific/cdss/division-2-arkansas

Table 3
Historically Irrigated Acreages Identified on Aerial Photographs

Aerial Photograph	Image Source	Estimate of Irrigated Area (acres)
Diamond A aerial, 9/4/1988, infrared	earthexplorer.usgs.gov	1,088.65
Diamond A aerial, 8/16/1993, black and white	earthexplorer.usgs.gov	1,055.64
Diamond A aerial, 8/1/2009, color	earthexplorer.usgs.gov	1,092.41
Diamond A aerial, 09/2015, color	earthexplorer.usgs.gov	1,100.94
Schweizer aerial, 9/4/1988, infrared	earthexplorer.usgs.gov	201.68
Schweizer aerial, 8/16/1993, black and white	earthexplorer.usgs.gov	205.92
Schweizer aerial, 8/1/2009, color	earthexplorer.usgs.gov	204.73
Schweizer aerial, 09/13/2015, color	earthexplorer.usgs.gov	212.20
Mameda aerial, 9/4/1988, infrared	earthexplorer.usgs.gov	149.43
Mameda aerial, 7/25/1993, black and white	earthexplorer.usgs.gov	155.40
Mameda aerial, 8/1/2009, color	earthexplorer.usgs.gov	147.58
Mameda aerial, 09/13/2015, color	earthexplorer.usgs.gov	157.57
Groves aerial, 9/5/1988, infrared	earthexplorer.usgs.gov	258.37
Groves aerial, 7/25/1993, black and white	earthexplorer.usgs.gov	250.91
Groves aerial, 8/1/2009, color	earthexplorer.usgs.gov	186.77
Groves aerial, 8/25/2015, color	earthexplorer.usgs.gov	262.36
Mayhoffer aerial, 9/5/1988, infrared	earthexplorer.usgs.gov	30.93
Mayhoffer aerial, 7/25/1993, black and white	earthexplorer.usgs.gov	30.60
Mayhoffer aerial, 8/1/2009, color	earthexplorer.usgs.gov	32.44
Mayhoffer aerial, 8/25/2015, color	earthexplorer.usgs.gov	35.19

Irrigated acreages for any study period years after the final aerial photograph of any Participating Farm were assumed to be equal to that year. For example, the Groves Farm irrigated acreages for 2016 and 2017 were set at 35.19 acres, which is the 2015 acreage for that farm. Irrigated acreages for years between aerial photographs were prorated based on the acreages for the years prior to and following that period. The resulting acreages were entered into the data tabs of the LFT for each of the Participating Farms.

D. HCU for Shares and Acreage to be Fallowed During the Pilot Project

The number of acres to be fallowed on each farm and the associated number of shares to fallow under the Pilot Project were determined based on discussions with the participating farmers and range from 15% to 100% of the shares of each the Participating Farms (see Table 4 for additional detail). Colorado Springs may use up to approximately 1,930 acre-feet of water each year for up to three years during the 10-year term of the Pilot Project to provide water to replenish water supplies during or after a drought. The 1,930 acre-feet includes consumptive use of farm headgate deliveries and depletions resulting from deep percolation that historically returned to the Arkansas River after the irrigation season as lagged return flows, which will be replaced by Colorado Springs using their

fully consumable replacement sources. The number of shares allocated to fallowed acres will be based on the number of shares per acre for each Participating Farm. Table 4 below provides the Pilot Project shares, maximum fallowed shares and the percentage of shares fallowed.

Table 4
% Shares Fallowed During Years Water is Used

Participating Farm	Pilot Project Shares	Fallowed Shares	% Shares Fallowed
Diamond A	1087.0	450	41.40%
Schweizer	195.5	30	15.35%
Mameda	99.0	60	60.61%
Groves	156.2	60	38.40%
Mayhoffer	35.0	35	100.00%
Total	1572.7	635	40.38%

Per the Criteria and Guidelines, the historical consumptive use under the Pilot Project is limited based on LFT results as follows: (1) the maximum volume of consumptive use in a given month is based on the average of the three greatest consumptive use results in that month over the study period, and (2) the volumetric limit for the annual consumptive use amount is based on the average of the three greatest years over the study period.

The tables required by Section II.G are attached in Appendix B (Diamond A Farm), Appendix C (Schweizer Farm), Appendix D (Mameda Farm), Appendix E (Groves Farm), and Appendix F (Mayhoffer Farm) as well as some additional tables generated by the current version of the LFT.

The LFT was run using the Pilot Project historical irrigated acres, identified in Table 2, for each Participating Farm. The results were then prorated to reflect acre-feet per-acre consumptive use amounts using the acreage irrigated in the final year of the study period and applied to the acreage to be fallowed for operations. The results of this analysis indicate that the 635 shares associated with the lands to be fallowed in years of operation historically provided an average annual consumptive use of 1,124.8 acre-feet. Note that the LFT indicates a historical maximum (2011) of 1,399.4 acre-feet per year and a minimum (2002) of 332.6 acre-feet per year for the Subject Shares. Please see Table 5 below and/or Appendices B through F, Table 14 for a summary of these values for each farm.

Table 5
Historical Consumptive Use, Fallow Acres and Fallow Shares

Farm Name	HCU Minimum (2002)	HCU Average	HCU Maximum Year (2011)	HCU Average	Current Irrigation (2015)	Pilot Project Irrigation	Adjusted HCU Average	Fallow Fields	CU Fallow Minimum (2002)	CU Fallow Average	CU Fallow Maximum (1996)
	acre-feet	acre-feet	acre-feet	acre-feet /acre	acres	acres	acre-feet /acre	acres	acre-feet	acre-feet	acre-feet
Diamond A	228.9	728.5	984.5	2.04	1123.7	894.9	1.97	370.5	172.4	727.7	940.9
Schweizer	17.1	60.4	67.3	1.91	212.2	212.2	1.86	32.6	13.8	60.4	79.3
Mameda	34.2	140.0	134.6	1.52	157.6	157.6	1.47	95.5	33.6	139.9	187.2
Groves	34.2	132.1	134.6	1.74	262.4	230.0	1.50	88.3	30.8	132.0	174.1
Mayhoffer	18.2	63.8	78.5	1.98	35.2	35.2	1.81	35.2	14.8	63.7	82.8
Total	332.6	1124.8	1399.4	-	1791.1	1529.8	-	622.0	265.2	1123.7	1464.2

Based on the year of historical minimum, calculated historical average, and the year of historical maximum diversions, fallowing of the fields associated with the Subject Shares result in minimum, average and maximum annual consumptive use values of 265.2 acre-feet, 1,123.7 acre-feet and 1,464.2 acre-feet, respectively, as shown in Table 5 above.

This HCU analysis demonstrates the amounts of water that may be made available as consumptive use from the lands anticipated to be fallowed during pilot project operations for temporary municipal use by Colorado Springs. The actual amounts of water provided to Colorado Springs will vary depending on the actual number of acres fallowed during that year's operations, Colorado Springs' water needs, and water availability under pilot project operations. Under any circumstance, the Pilot Project will not be operated such that the total transferable consumptive use would exceed 1,000 acre-feet per year.

II. Lagged Historical Return Flow Obligations

A. URFs for Participating Farms

As set forth in Section II.G, the Glover-Balmer analytical solution was used to calculate the lag effect of deep percolation return flows for the Participating Farms, per the following criteria,

- Specific Yield = 0.20
- Transmissivity according to cited reference or through the applicant's detailed analysis
- Use of the relevant ditch as the location of the no-flow boundary
- The distance to the river is equal to the length of a line extending perpendicular from the river or drain to the centroid of the irrigated land; return flows accrue to the river or drain at this location on the river; and

- The number of monthly time steps (URF period) for the URF will be limited to the number of months required for at least ninety percent of the impact to occur to the stream; the URFs will then be normalized by apportioning the remaining return flows across the URF period.

The transmissivity[6] was determined from the hydraulic conductivity of seven wells in the Arkansas River basin, two located between the Towns of Manzanola and Swink and three located between the Towns of Swink and La Junta (all in valley-fill deposits in the main valley) and three located in the Timpas Creek valley (valley-fill deposits), and the saturated thickness of wells located near the subject farms. The Well ID, Saturated Thickness (B), Transmissivity (T), and Hydraulic Conductivity (K) estimated for the eight wells are presented in the following Table 6.

Table 6
Hydraulic Conductivity

Well ID	Description	B (feet)	T (gpd per foot)	K (gpd)
C-23-56-8ddc	Manzanola to Swink	18.0	55,000	3,056
C-23-57-2ddc	Manzanola to Swink	12.0	50,000	4,167
C-23-55-33bad	Swink to La Junta	21.4	60,000	2,800
C-23-55-30bbc	Swink to La Junta	28.0	115,000	4,107
C-24-56-18acb &18acb2	Timpas Creek	20.0	110,000	5,500
C-24-56-4cdc	Timpas Creek	20.0	80,000	4,000

The K for the Diamond A, Schweizer, and Mameda Farms is the mean for the wells located between the Towns of Manzanola and Swink. The K for the Groves Farm is that of Well IDs C-23-55-30bbc, C-24-56-4cdc, and C-24-56-18acb and acb2[7]. The K for the Mayhoffer Farm is that of Well IDs C-23-55-30bbc, C-23-55-33bad, and C-24-56-4cdc, C-24-56-18acb and acb2.

The saturated thicknesses (B) between the farms and the Arkansas River were determined via evaluation of well logs for wells located in the vicinity of the farms. The average B for wells grouped in the above categories was calculated, and the average of these values was used as the B for each Glover-Balmer analytical solution. Table 7 contains the well data and saturated thickness for each farm.

[6] USGS Ground Water Circular No. 11, Woodrow W. Wilson, United States Geological Survey, 1965.
[7] Since the two wells located at this location have the same transmissivity, saturated thickness and hydraulic conductivity, they were considered as one well for the purposes of this report to prevent skewing of the data.

Table 7
Saturated Thickness

Farm	Permit No.	Static Water Level / Top of Saturated Thickness (ft)	Depth (ft)	Bottom of Sands/Gravels (ft)	Bottom of Saturated Thickness (ft)	Saturated Thickness (ft)
Diamond A	13671-R-R	8	44	44	44	36
	13672-R	9	35	-	35	26
	13673-R	21	33	-	33	12
	13674-R	21	38	-	38	17
	13674-R-R	25	38	38	38	13
	13677-R-R	20	42	42	42	22
	1411-R	18	40	-	40	22
	234251-	9	25	25	25	16
	2763-F	12	46	50	46	34
	6163-F	9	18	18	18	9
	6164-F-R	28	50	50	50	22
	6429-R	6	27	-	27	21
	6430-R-R	9	29	29	29	20
					Diamond A Average:	**20.8**
Schweizer	10292-R	13	39	-	39	26
	9024-F-R	20	32	-	32	12
	5982-F	16	34	34	34	18
	5983-F	16	30	30	30	14
	2763-F	12	46	50	46	34
					Schweizer Average:	**20.8**
Mameda	239990--A	30	43	44	43	13
	16109-R-R	30	48	48	48	18
	14087-R-R	27	47	46	46	19
	6148-R	28	55	55	55	27
	6383-F	28	74	79	74	46
	6698-R-R	24	40	38	38	14
	277254--A	22	40	40	40	18
	10212-R	14	36	36	36	22
	21383-F-R	31	51	51	51	20
	6633-R-R	23	38	36	36	13
					Mameda Average:	**21.0**
Groves	1706-R-R	15	31	31	31	16
	688-R-R	19	32	40	32	13
	1707-R	20	42	-	42	22
	5184-F	31	46	-	46	15
	9536-F	6	30	30	30	24
	10069-R	21	41	-	41	20
					Groves Average:	**18.3**
Mayhoffer	15342-R-R	14	23	23	23	9
	15345-R-R	17	25	25	25	8
	15345-R	20	36	-	36	16
	492-RN	6	86	-	86	80
	66322	5	20	20	20	15
					Mayhoffer Average:	**25.6**

The calculated transmissivities for the participating farms are shown in Table 8 below.

Table 8
Resultant Transmissivities

Farm	Hydraulic Conductivity (gpd/sq-ft)	Saturated Thickness (ft)	Transmissivity (gpd/ft)
Diamond A	3,611	20.8	75,000
Schweizer	3,611	20.8	75,111
Mameda	3,611	21.0	75,833
Groves	4,536	18.3	83,155
Mayhoffer	4,102	25.6	105,006

The distances from the drain or river, as appropriate, and the no-flow boundary to the centroid of irrigated areas are illustrated on Figures 22 through 26 included in Appendix A. The URFs were developed using the Integrated Decision System Alluvial Water Accounting System (IDS AWAS). The URFs are included in Appendix G. Per Section II.G, the time steps encompass 90% of the impact, and the URFs were normalized by apportioning the remaining return flows across the URF period. The estimated lagged historical return flows are illustrated in Table 24 of Appendices B through F and described in following sections of this report.

B. Lagged Return Flows Deliveries

Stored water derived from the Colorado Springs/Super Ditch Pilot Project, the supplies listed in Appendix H, and/or other fully consumable sources available to Colorado Springs, will be used to meet the lagged historical return flow obligations associated with the fallowing of the historically irrigated lands. Transit losses as assessed by Division 2 will be included from the point of release to the confluence of the Arkansas River and Crooked Arroyo. Lagged historical return flow releases will generally be made from Lake Meredith but may also be made from Pueblo Reservoir, or by utilizing Colorado Springs' fully reusable return flows available at the mouth of Fountain Creek.

C. Depletion Credits for Operation Years

Use of the LFT to model fallowing for each farm (as described above) beginning in March of the first year of operations, and average diversions, provides for an average historical consumptive use of 1,123.7 acre-feet (limited by the maximum 3 monthly amounts). Since lagged return flows after the irrigation season will be replaced by releases of water from storage, in an average year an additional 805.2 acre-feet of stream depletion credits from lagged return flows are available for exchange and municipal use by Colorado Springs (see Appendix I, Table 1.) The historical consumptive use and stream depletion credits provides for a total of 1,928.8 acre-feet of water available for exchange and use by Colorado Springs in an average year after deducting irrigation season lagged return flow replacements. However, exchanges to Colorado Springs will be limited to a historical consumptive use delivery of 1,000 acre-feet, plus the associated delayed return flow stream depletion credits, in any leasing year.

D. Post-Pilot Project Return Flow Obligations

Using the above-described URFs for the Participating Farms, post-fallowing lagged return flow obligations for operations are estimated to total 805.2 acre-feet over the following 5 years, with nearly half of the lagged return flow obligations occurring in the first year (see Appendix I, Table I-1). Assuming 3 years of pilot project operations under average year conditions, total Post-Pilot Project Return Flow Obligations are estimated at approximately 1,193.3 acre-feet for less than 5 years following the last month of operations (see Appendix I, Table I-2). Post-Pilot Project Return Flow Obligations will be met via release of water from the sources available to Colorado Springs.

E. Source of Water to Replace Historical Return Flow Obligations

During the term of the Colorado Springs/Super Ditch Pilot Project, all return flow obligations (consisting of both tailwater and lagged deep percolation return flows) occurring during the irrigation season which result from diversions during the same irrigation season will be met using portions of the farm headgate deliveries of the water available from the fallowing of historically irrigated lands. All excess lagged stream depletion credits may be exchanged into Pueblo Reservoir, or step exchanged, either for all approved uses by Colorado Springs and/or for later use to replace the remaining pilot project lagged deep percolation return flow obligations. In addition, Colorado Springs has various sources of water that will be available to meet lagged deep percolation return flow obligations owed during and after the conclusion of the Pilot Project's operations. Colorado Springs proposes to use any fully consumable water available to Colorado Springs Utilities to replace such lagged deep percolation return flow obligations, including, but not limited to, those listed in Appendix H.

To the extent possible, Colorado Springs intends to replace the lagged deep percolation return flows with other fully consumable sources available to it in Lake Meredith, at the confluence of Fountain Creek, or in Pueblo Reservoir, and to fully consume the deep percolation return flow credits exchanged to Pueblo Reservoir by exchanging this water into its municipal system under the decree entered in Case No. 05CW96. Pursuant to the Letter Agreement between the Super Ditch and Colorado Springs, the Super Ditch and Colorado Springs will maintain a projection that shows the monthly replacement obligations owed to the Arkansas River and accounting which demonstrates that the river is kept whole. As demonstrated below, Colorado Springs has more-than-sufficient water available to it from transmountain sources and changed irrigation water rights (*i.e.*, the Colorado Canal) to meet these obligations.

As shown in Appendix H, Colorado Springs owns shares in a number of ditch and reservoir companies with water rights on or tributary to the Arkansas River. Where necessary, these ditch and reservoir company shares have undergone water court proceedings to changes the use of those water rights, whereby the historical consumptive use associated with those shares has been quantified. These sources are listed in Table 9 below:

Table 9
Colorado Springs' Supplies for Return Flow Replacement

Company	Shares	Average Annual Yield* (Acre-feet
Colorado Canal Company	28,012.76	16,057
Lake Meredith Reservoir Company	21,084.75	(included with Colorado Canal)
Lake Henry Reservoir Company	6,923.15	(included with Colorado Canal)
Sugarloaf Water Rights	-	200
Denver Basin Reusable Water	-	-
Fountain Mutual Irrigation Company Water	144	+
Chilcott Ditch Company Water	9	+
Temporary Use Agreement Waters	-	-
Total Reusable Return Flows	-	23,360

* Colorado Springs' actual annual diversions, 1994-2018.
+ Fountain Mutual Irrigation Company and Chilcott Ditch Company are new sources for Colorado Springs, so no long-term average has been established.

Though many of these sources have a firm yield of zero, reusable return flows provide an average yield of 23,360 acre-feet annually that could be made available to meet the post-project return flow obligations, which is more than adequate to satisfy the maximum annual estimated Post-Pilot Project Return Flow Obligations of 681.9 acre-feet projected to occur in 2023 (see Appendix I, Table I-2), based upon three-years of consecutive operation of the Pilot Project during its ten-year term.

In addition, current storage of consumable water from these sources in Lake Meredith and Pueblo Reservoir, which is provided in the following table, is more than adequate to replace the total maximum estimated Post-Pilot Project Return Flow Obligations of 1,193.3 acre-feet.

Table 10
Current Storage of Colorado Springs' Supplies Available for Return Flow Replacement
(as of July 2019, all values in acre-feet)

Company	Current Storage	
	Lake Meredith	Pueblo Reservoir
Colorado Canal Company	3,010	385
Lake Meredith Reservoir Company	50	n/a
Lake Henry Reservoir Company	2,310	n/a
Sugarloaf Water Storage Rights	0	615
Denver Basin Reusable Water	0	0
Fountain Mutual Irrigation Company Water	0	0
Chilcott Ditch Company Water	0	0
Temporary Use Agreement Waters	0	0
Total Reusable Return Flows	3,200	10,600
Total	8,570	11,600

As demonstrated above, the firm (dry-year) yield of these various water supplies currently owned by Colorado Springs are more than sufficient to meet the Post-Pilot Project Return Flow Obligations. These sources and other fully consumable sources that may be available through future purchase, lease, or trade to Colorado Springs, could serve to meet these obligations. Lagged historical return flow releases will generally be made from Lake Meredith but may also be made from Pueblo Reservoir or by utilizing Colorado Springs' fully reusable return flows available at the mouth of Fountain Creek.

F. Pueblo Reservoir Excess Capacity Storage

Contract No. 16XX650031, United States of America, Department of the Interior, Bureau of Reclamation, Fryingpan-Arkansas Project, which is titled "Master Contract between the United States of America and Southeastern Colorado Water Conservancy District for the Use of Excess Capacity in the Facilities of the Fryingpan-Arkansas Project" (Master Contract) was signed in December of 2016. The contract is for a forty-year term and allows the SECWCD to annually utilize up to 29,938 acre-feet of excess capacity storage in Pueblo Reservoir, if and when available. The excess capacity storage is utilized by subcontracting with master contract participants for the storage of non Fryingpan-Arkansas Project water and Fryingpan-Arkansas Project water return flows. The purpose of the master contract is to provide for more storage opportunities for entities that utilize excess capacity contracts.

As a master contract participant, Lower Ark benefits from the storage opportunities provided by the Master Contract, which has been used by the Catlin Pilot Project to store water exchanged to Pueblo Reservoir and will be by this Pilot Project for the same purpose. Lower Ark's contract currently allows for a minimum excess capacity storage of 2,500 acre-feet per year, though the storage may be increased to 5,000 acre-feet per the terms of the November 2, 2016 subcontract between the Southeastern Colorado Water Conservancy District and Lower Ark. It is anticipated the storage will

be increased to the 5,000 acre-feet in order to store the additional water exchanged under the Pilot Project until December 31 of each year as contemplated by the Super Ditch and CSU Contract.

III. Description of Pilot Project Operations

The Colorado Springs/Super Ditch Pilot Project will be operated by temporarily drying up adequate acreage to provide the amount of depletion credits desired by Colorado Springs, up to 1,000 acre-feet annually. 15% to 100% of each Participating Farm will be fallowed during each of the three years that water is delivered to Pueblo Reservoir on behalf of Colorado Springs.

Applicants have investigated and confirmed that there are no local government land use requirements that apply to operation of the Colorado Springs/Super Ditch Pilot Project. As proposed to be operated, the Otero County 1041 Regulations apply to a "municipal and industrial water project" that involves the permanent cessation of irrigation, the lease of water rights resulting in the cessation of irrigation for more than three consecutive years; or the development of the agricultural land for uses other than irrigated agriculture. *See* Guidelines and Regulations for Areas and Activities of State Interest, County of Otero, State of Colorado § 3.103(3)(b). The agreements with participating farmers specifically provide that the same lands within any Participating Farm will not be fallowed for more than three years.

In addition, the agreements between Super Ditch and participating farmers require the participating farmers to implement weed control and erosion protection for the lands removed from irrigation as a part of the Colorado Springs/Super Ditch Pilot Project. This includes the acknowledgement of, and agreement to comply with, applicable County code noxious weed management requirements, including the Otero County Noxious Weed Management Plan, Otero County Code, Chapter 12 – Vegetation.

A. City of Colorado Springs

1. Municipal Use

It is proposed that Colorado Springs will use depletion credits derived from the Subject Shares to bolster municipal supplies, which will be delivered via exchange (decreed in Case No. 10CW04 or otherwise) of said water into Pueblo Reservoir, either directly or via stepped exchanges. Super Ditch will deliver these supplies to Colorado Springs at Pueblo Reservoir. Colorado Springs will be responsible for delivering such water to their municipal system via the exchange decreed in Case No. 05CW96 or otherwise[8]. These credits will be used for all lawful beneficial uses including, but not limited to, augmentation, all municipal uses, reuse and successive use, and storage as required.

[8] Exchanges completed by Colorado Springs subsequent to storage in Pueblo Reservoir are at Colorado Springs' discretion and are not included as operations under the Colorado Springs/Super Ditch Pilot Project. As such, Colorado Springs will be responsible for obtaining the necessary approval for any such subsequent exchanges.

2. Delivery of Depletion Credits

Prior to exchange to Pueblo Reservoir, the water attributable to the 635 fallowed shares will be delivered to the headgate of the Catlin Canal and measured through the ditch flume. The portion of the delivery attributable to ditch losses (canal losses of 10.43% and lateral losses of 3.5%) will be left in the ditch. The remaining water will be measured through the flume at the Timpas Creek augmentation station or the Crooked Arroyo augmentation station and returned to the Arkansas River at the locations identified above, wherefrom the available depletion credits will be exchanged to Pueblo Reservoir for use by Colorado Springs.

Stepped exchanges may be used when exchange potential exists in only a portion of the reach between the augmentation stations and Pueblo Reservoir. For example, if there is exchange potential from the Timpas Creek augmentation station to the Colorado Canal, but not from the Colorado Canal to Pueblo Reservoir, water may be exchanged to the Colorado Canal for delivery to Lake Meredith. This water may later be released and exchanged to Pueblo Reservoir when exchange potential exists from the Lake Meredith point of delivery to the Arkansas River to Pueblo Reservoir. Applicants would only operate stepped exchanges into storage locations for which Applicants have obtained a right to do so. Use of stepped exchanges, while desirable, is not necessary for the proposed pilot project operations.

3. Return Flow Obligations

During the term of the Colorado Springs/Super Ditch Pilot Project, return flow obligations will be met through portions of the headgate diversions of water available from the fallowed lands and releases from Pueblo Reservoir and other fully consumable sources available to Colorado Springs. When depletion credits are in excess of the return flow amounts owed for that month, the excess depletion credits may be exchanged to Pueblo Reservoir for all approved uses by Colorado Springs or for replacement of future return flow obligations. The administrative reach for the exchange will extend approximately 90 miles from the confluence of Timpas Creek and the Arkansas River, or 94 miles from the confluence of Crooked Arroyo and the Arkansas River, upstream to the outlet works of Pueblo Reservoir. Water exchanged to Pueblo Reservoir and later released to meet return flow obligations is subject to evaporation while in Pueblo Reservoir. Lagged return flow obligations associated with Colorado Springs' use of the water available from the fallowed lands may also be met through releases of fully consumable water from Lake Meredith, previously stored water in Pueblo Reservoir, or by utilizing reusable return flows at the mouth of Fountain Creek. Transit losses as assessed by Division 2 will be included from the point of release. It is proposed that winter return flow replacement releases be booked over to the Winter Water program and/or released to the stream as determined necessary to replace such return flows to the appropriate water rights.

These replacement operations are described in detail in the attached Letter Agreement between the Super Ditch and Colorado Springs. To the extent possible, Colorado Springs intends to exchange the deep percolation return flow credits delivered to Pueblo Reservoir into its municipal system under the decree entered in Case No. 05CW96 (where such water will be fully consumed for municipal uses), and then replace the deep percolation return flows owed to the Arkansas River by releasing to the Arkansas River other fully consumable sources as described in this section. The

purpose of this operation is to avoid the construction of recharge ponds, which the Super Ditch and Colorado Springs believe will simplify this and future alternative transfer method projects.

4. Operations

Projections indicate up to 1,928.8 acre-feet of irrigation season stream depletion credits (consisting of 1,123.7 acre-feet of the historical consumptive use credit and 805.2 acre-feet of lagged deep percolation return flows, will be allocated to Colorado Springs during a year of average farm headgate deliveries (see Appendix I, Table 1. The 1,928.8 acre-feet of irrigation season stream depletion credit may be exchanged to Pueblo Reservoir for delivery to Colorado Springs. The dry-year (2002) irrigation season stream depletion credit is estimated at 428.7 acre-feet and the wet year (1996) irrigation season stream depletion credit is estimated at 2,550.4 acre-feet, including both consumptive use and lagged deep percolation return flows. Note that deliveries for Colorado Springs per the Pilot Project will cease when 1,000 acre-feet of consumptive use is delivered to Pueblo Reservoir.

B. *Exchanges*

Several exchanges have been discussed in the above operations section of this report, though not all of these exchanges may be necessary for the proposed operations. For example, stepped exchanges will only be necessary when insufficient exchange potential is available to exchange the depletion credits to Pueblo Reservoir. Exchanges that may be operated as part of the Colorado Springs/Super Ditch Pilot Project include the following exchange reaches.

- Timpas Creek and Arkansas River Confluence to Pueblo Reservoir.
- Crooked Arroyo and Arkansas River Confluence to Pueblo Reservoir.
- Stepped exchanges may also occur from the Timpas Creek and Arkansas River Confluence, the Crooked Arroyo and Arkansas River Confluence for storage in Lake Henry and Lake Meredith, or the Holbrook Canal for storage in Dye Reservoir and/or Holbrook Reservoir. The stored water will be subsequently released from these reservoirs and exchanged from the reservoir's points of delivery to the Arkansas River to Pueblo Reservoir.
- Stepped exchanges may also occur to and from other diversion and delivery points located in the reach from the Crooked Arroyo confluence with the Arkansas River to Pueblo Reservoir.

In evaluating the potential for operating the above-described exchanges, we have reviewed the work conducted by Martin and Wood Water Consultants (M&W) in support of Case No. 10CW04 (Division 2 Water Court). That work indicates that there is Arkansas River exchange potential to support further exchanges from the Catlin Canal to Pueblo Reservoir. We have also reviewed the expert report, dated September 2, 2014 prepared by the Wilson Water Group in support of Southeastern Colorado Water Conservancy District's application of rights of exchange in Case No. 06CW08 (Water Div. 2). That report also indicates that exchange potential exists at times from the Catlin Canal to

Pueblo Reservoir. Even when exchange potential does not exist in the complete reach, there may be exchange potential in portions of the reach to facilitate stepped exchanges.

Based on this, as well as our professional experience in the administration of the Arkansas River that exchange operations can be coordinated to leverage exchange potential, it is the opinion of M&W that through the exchanges and stepped exchanges described above, it will be possible to exchange water into Pueblo Reservoir for use by Colorado Springs and/or for the replacement of return flows in pilot project operations.

C. Projection

A projection of example operations in an average year is attached in Appendix I, Table I-1. In this example, historical consumptive use is 1,123.7 acre-feet, tailwater is 325.8 acre-feet, deep percolation is 1,303.0 acre-feet, and lagged deep percolation from March 15 through November 14 (operation period) is 497.8 acre-feet. Tailwater and lagged deep percolation return flows occurring during the operation period will be replaced by diversion and return to the Arkansas River via the Timpas Creek and/or the Crooked Arroyo augmentation stations. Lagged deep percolation return flows for the next five years after the operation period is a total of 805.2 acre-feet, with a maximum replacement requirement of 400.1 acre-feet in 2021. The lagged deep percolation return flows occurring resulting from diversions during the irrigation season from 3/15 to 11/14 will be replaced with water returned to the Arkansas River through augmentation stations. Colorado Springs will replace all remaining lagged deep percolation return flows. Table 11 summarizes the projected HCU and return flow amounts.

Table 11
Summary of Projection Results
(All values in acre-feet)

HCU	Tailwater	Deep Percolation	Lagged Deep Percolation	
			(3/15-11/14)	(11/15 + 54 Months)
1123.7	325.8	1303.0	497.8	805.2

As demonstrated by the preceding paragraphs, because the Pilot Project operations will be managed and coordinated in a manner to take advantage of available exchange potential and to utilize other water resource management techniques, it is our opinion that there are no administrative or operational obstacles to the proposed operation of the Colorado Springs/Super Ditch Pilot Project, and that said project can and will be implemented using existing infrastructure, and no additional diversion structures, augmentation stations, or return structures will be needed for operations.

IV. Accounting

Example accounting forms are attached in Appendix J. The operations accounting sheets total the daily augmentation station discharges and deliveries for each operation. The accounting will use the tables listed in Appendix A of Section II.G of the Criteria and Guidelines as the tool for comparing this historical use analysis with projected operations as a pilot project.

V. Proposed Terms and Conditions

It is our opinion that operation of the Colorado Springs/Super Ditch Pilot Project pursuant to the following terms and conditions will not result in injury to other vested water rights, conditional water rights, or contract rights of others.

1. All water used in the Pilot Project will be first delivered to the headgate of the Catlin Canal, and only lands irrigated under the Catlin Canal Company will be used in the leasing-fallowing operations of the Pilot Project.

2. No lands shall be fallowed for more than three years during the ten-year period of the Colorado Springs/Super Ditch Pilot Project nor shall more than 30% of the parcels on each participating farm be fallowed for more than the ten consecutive years of the Pilot Project.

3. By March 1 of each plan year for an approved pilot project, the pilot project sponsor shall notify and provide mapping to the Division Engineer of those parcels to be fallowed and the associated shares for the upcoming plan year. Lands and shares available and approved for fallow through operation of an approved pilot project are limited to those identified in the pilot project application.

4. The following monthly factors will be used to calculate monthly composite consumptive use factors, which will be applied to augmentation station deliveries to determine monthly consumptive use. The monthly composite consumptive use factors will be calculated as the sum of monthly consumptive use for each farm multiplied by the fallowed shares for each farm, divided by the total number of fallowed shares. The calculation of monthly composite consumptive use factors will be performed for each month from March through November.

Consumptive Use Factors

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Diamond A	-	-	0.188	0.234	0.384	0.492	0.487	0.472	0.428	0.167	0.166	-
Schweizer	-	-	0.301	0.299	0.456	0.539	0.547	0.548	0.536	0.412	0.327	-
Mameda	-	-	0.550	0.489	0.516	0.550	0.550	0.550	0.550	0.550	0.550	-
Groves	-	-	0.430	0.389	0.489	0.548	0.550	0.550	0.550	0.508	0.490	-
Mayhoffer	-	-	0.227	0.263	0.422	0.522	0.527	0.527	0.482	0.247	0.281	-

5. The portion of available pilot project augmentation station headgate delivery that is not credited as consumptive use will first be allocated to irrigation season tailwater and irrigation season lagged deep percolation return flow maintenance. The remaining available pilot project augmentation station headgate delivery will be available for exchange to Pueblo Reservoir for all approved uses by the City of Colorado Springs. The available pilot project augmentation station headgate delivery will be calculated as the farm headgate delivery minus lateral loss of 3.5% and consumptive use. Consumptive use is calculated as the available pilot project augmentation station headgate delivery multiplied by the composite consumptive use factor. Return flows are equal to the available pilot project augmentation station headgate delivery minus the consumptive use. Tailwater return flow is the return flow multiplied by 20%, and deep percolation return flow is the return flow multiplied by 80%.

6. The monthly and annual consumptive use will be limited by the following maximum values which are the averages of the three greatest months for each month and three greatest years of the study period, consistent with the Criteria and Guidelines. The values in the table will be multiplied by the ratio of the number of shares fallowed for each farm divided by the total number of shares included in the Pilot Project for each farm, (not including shares leased from the Colorado Division of Parks and Wildlife (CPW) since the consumptive use for CPW shares is not included in the below table).

Monthly and Annual Maximum Consumptive Use Credits
(All Values in Acre-Feet)

Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Diamond A	0.0	0.0	108.8	261.2	401.9	495.5	485.5	456.9	323.6	270.8	143.5	0.0	2278.0
Schweizer	0.0	0.0	33.3	58.1	77.2	93.1	96.5	90.9	68.2	58.1	32.0	0.0	481.7
Mameda	0.0	0.0	29.5	43.9	41.0	47.7	48.9	46.0	36.2	32.2	16.2	0.0	300.2
Groves	0.0	0.0	34.1	61.5	62.8	75.2	77.2	72.6	57.1	49.2	25.6	0.0	426.9
Mayhoffer	0.0	0.0	4.3	9.2	13.7	16.5	16.5	15.6	11.0	10.1	5.7	0.0	79.6

7. Deep percolation return flows for the Diamond A, Schweizer, Mameda, Groves, and Mayhoffer Farms will be lagged using the URFs attached in Appendix G. Return flows will be maintained via release of supplies available to Colorado Springs listed in Table 9 or other fully consumable sources available to Colorado Springs for replacement of return flows. Transit losses will be assessed from the point of release to the confluence of the Arkansas River and/or Crooked Arroyo based on the augmentation station(s) in use for the Pilot Project.

8. Fallowed parcels must be at least ten acres in size unless they comprise all of an existing CDSS parcel that is already less than ten acres. Parcels that represent a portion of an existing field can only be split in the same direction of historic irrigation unless a means of physical separation is approved by the CWCB based on the written

determination of the State Engineer. A physical separation must exist between any irrigated portion of a parcel and the dry-up portion. For dry-up fields left fallow or with a dry-land cover crop without permanent root system (that is, not alfalfa or pasture grass for example), the separation can be a ditch or tilled strip at least ten feet in width that prevents irrigation application from reaching the dry-up parcel. For partial fields containing deep-rooted crops such as alfalfa or pasture grass, a deep tilled separation of at least 25 feet must be maintained along with any ditches necessary to ensure no irrigation application to the dry-up portion. For any dry-up parcel that is planted with a dry-land crop (haygrazer, milo, millet, etc.), the crop should either be drilled at an angle to normal irrigation direction or a tilled strip maintained at the top of the field that clearly separates the crop from any possible irrigation source or both.

9. Dry-up of the fallowed fields will comply with the "Operating Procedures for Administration of Parcels Claimed for Augmentation Credits" of the Colorado State Engineer's Office. Re-irrigation of dry-up parcels shall not be allowed during the year in which such parcel is fallowed in pilot project operations.

10. Super Ditch will notify the Division Engineer of the status (dry land crop (must specify type), tilled and fallow, not tilled and fallow, stubble of past crop left on field, etc.) of each fallowed field in the Colorado Springs/Super Ditch Pilot Project by May 15 of each year of operations.

11. Super Ditch shall monitor fallowed parcels on a periodic basis to confirm the adequacy of dry-up in conformance with the terms and conditions of this protocol. Should non-compliance with the dry-up requirements of this protocol be discovered, Super Ditch shall immediately notify the Division Engineer in writing and take such corrective action as is required by the Division Engineer. Fallowed parcels shall be subject to inspection by the Division Engineer who shall inform the pilot project sponsor if non-compliance is found.

12. Super Ditch will ensure that all participating farmers are contractually bound to provide for weed control and erosion protection for the lands removed from irrigation as a part of the Colorado Springs/Super Ditch Pilot Project. This will include the acknowledgement of, and agreement to comply with applicable County code noxious weed management requirements, including the Otero County Noxious Weed Management Plan, Otero County Code, Chapter 12 – Vegetation.

13. Consumptive use credits and return flow obligations shall be calculated on a daily basis. Water allocated to deep percolation return flows that is not required to replace return flows on a given day will be allocated as a stream depletion credit. Such depletion credits may be exchanged to Pueblo Reservoir for all approved uses by Colorado Springs or stored to replace return flows as necessary.

14. Calculations of return flows owed to the river must be updated as needed (at least monthly), based on actual past water availability and estimated future availability. If there is an under delivery of return flow water in any month this under delivery shall be made up in the subsequent month.

15. Exchange into Pueblo Reservoir may occur only when there is at least 100 cfs of outflow (inclusive of hatchery flows) from Pueblo Reservoir. Such diversions/exchanges may not cause the outflow from Pueblo Reservoir to be less than 100 cfs. In addition, exchanges will be operated as junior to the City of Pueblo's recreational in-channel diversion water right awarded in Case No. 01CW160, and as though the right is in effect 24 hours per day.

16. Any exchange of water as a part of this Pilot Project not operated pursuant to a court decree must be approved in advance by the Division Engineer after a determination that there is sufficient exchange potential to accomplish the requested exchange without injury to other water rights.

17. Exchanges completed via the decree for Case No, 10CW04 will comply with all terms and conditions decreed therein.

18. Applicants may operate an exchange only if there is a live stream between the downstream exchange-from point and the upstream exchange-to point.

19. Stored water derived from the Colorado Springs/Super Ditch Pilot Project and/or fully consumable sources available to Colorado Springs will be used to meet the lagged historical return flow obligations associated with the fallowing of the historically irrigated lands. Transit losses as assessed by Division 2 will be included from the point of release to the confluence of the Arkansas River and Crooked Arroyo. Lagged historical return flow releases will generally be made from Lake Meredith but may also be made from Pueblo Reservoir, or by utilizing Colorado Springs' fully reusable return flows available at the mouth of Fountain Creek.

20. Any return flows not met by proper delivery of that portion of the available headgate diversions shall be made up from some other source decreed for this use or approved for this use by a substitute water supply plan. Absent prior approval by the Division Engineer of some other source, it will be assumed those losses will be made up from the consumptive yield of shares included in the Pilot Project and Colorado Springs' replacement sources.

21. All diversions shall be measured in a manner acceptable to the Division Engineer. Super Ditch shall install and maintain measuring devices as required by the Division Engineer for operation of the Pilot Project.

22. Accounting of water in this Colorado Springs/Super Ditch Pilot Project must be provided to the Division Engineer on forms and at times acceptable to him. Said accounting must be received by the 10th of the month following the month being reported. The name, mailing address and phone number of the contact person who is responsible for operation and accounting of this plan must be provided on the accounting forms.

23. The accounting will use the tables listed in Appendices B through G of this document as the tool for comparing historical use analyses with projected operations as a pilot project.

24. The name, e-mail and postal addresses, and phone number of the contact person who will be responsible for the operation and accounting of the Pilot Project must be provided with the accounting forms to the Division Engineer and Water Commissioner.

25. Pueblo Reservoir, Twin Lakes Reservoir and Fountain Valley Pipeline (or Conduit) are owned and operated as part of the Fryingpan-Arkansas Project by the United States Department of the Interior, Bureau of Reclamation. Applicants shall store water in Pueblo Reservoir only so long as they have a contract with the owners of that structure, and such storage and use is within the effective time period of such contract. Any use of Fryingpan-Arkansas Project facilities by Applicants, for storage, exchange or otherwise, will occur only with the written permission of the owner of said reservoir, and will be made consistent with such policies, procedures, contracts, charges, and terms as may lawfully be determined by the U.S. Bureau of Reclamation or its successors in interest, in their good faith discretion. Any approval of the Colorado Springs/Super Ditch Pilot Project will not give Applicants any rights to use of Fryingpan-Arkansas Project structures, including Pueblo Reservoir, but will not alter any existing rights Applicants may have of any use of the Fryingpan-Arkansas Project facilities. Applicants shall not operate the Colorado Springs/Super Ditch Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project.

26. Applicants acknowledge that any Colorado Springs/Super Ditch Pilot Project approval does not give Applicants any rights to ownership or use of any Fryingpan-Arkansas Project structure, or any rights of ownership or rights to purchase or receive allocation of Fryingpan-Arkansas Project water, and does not alter any existing rights (including any right to renew existing contracts) Applicants may have.

27. Applicants shall not operate the Colorado Springs/Super Ditch Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project. Any water stored in Pueblo Reservoir as a part of this Colorado Springs/Super Ditch Pilot Project shall be beneficially used within Southeastern's district boundaries.

28. Use of Winter Water to meet return flow obligations from the fallowing of historically irrigated lands shall be consistent with the terms and conditions contained in the Winter Water Storage Program ("WWSP") decreed in Case No. 84CW179 (Water Div. 2) and Southeastern's contract for Winter Water storage in Pueblo Reservoir. Applicants Winter Water shall be delivered through the Catlin Canal during the period of March 15 through November 14 at the same time as deliveries of Winter Water Storage are made to other Catlin Canal shareholders.

29. To the extent that the Colorado Springs/Super Ditch Pilot Project stores the net depletion amount of the participating shares in Pueblo Reservoir, such water may be booked over to replace return flow obligations during the Winter Water storage period

on a monthly or weekly basis, or as otherwise required by the Division Engineer, to participants in the Winter Water Storage Program as necessary to prevent injury to the water rights included in that Program.

30. Prior to operation of the Pilot Project, Applicants shall provide proof to the Division Engineer that all agreements and approvals necessary for operation of the Pilot Project have been obtained.

Through the use of the LFT to evaluate historical consumptive use, and the above-described operations and accounting, the Colorado Springs/Super Ditch Pilot Project will provide data from which the CWCB and State Engineer can evaluate the efficacy of using a streamlined approach for determining historical consumptive use, return flows, the potential for material injury to other water rights, and conditions to prevent injury. Operations and accounting for the Colorado Springs/Super Ditch Pilot Project will also demonstrate how to operate, administer and account for the practice of fallowing irrigated agricultural land for leasing water for temporary municipal use without causing material injury to other vested water rights, decreed conditional water rights, or contract rights to water.

Please contact us if you have any questions or any additional information is needed for your review of this application.

Sincerely,
MARTIN AND WOOD
WATER CONSULTANTS, INC.

Craig M. Lis, P.E.
Principal Engineer

Attachments: Fallowing-Leasing Project Agreement By and Between The Lower Arkansas Valley Super Ditch Company and The City of Colorado Springs, Acting By and Through Its Enterprise, Colorado Springs Utilities
Letter Agreement concerning the Replacement of Return Flows for the CS-U/Super Ditch Pilot Project

List of Appendices

Appendix A – Figures
Appendix B – Diamond A Farm Historical Consumptive Use Analysis Tables
Appendix C – Schweizer Farm Historical Consumptive Use Analysis Tables
Appendix D – Mameda Farm Historical Consumptive Use Analysis Tables
Appendix E – Groves Farm Historical Consumptive Use Analysis Tables
Appendix F – Mayhoffer Farm Historical Consumptive Use Analysis Tables
Appendix G – Farm URFs
Appendix H – Replacement Supplies

Appendix I – Projections
Appendix J – Draft Accounting

The report, attachments, appendices, LFT spreadsheet and a parcel shapefile may be accessed by entering the following link in your file browser (e.g., Windows Explorer). Please be patient, as the appendices may take a few minutes to load.

ftp://server.martinandwood.com

The user name and password are as follows.

User name: CSSDpilot2020
Password: catlin

FALLOWING-LEASING PROJECT AGREEMENT
BY AND BETWEEN
THE LOWER ARKANSAS VALLEY SUPER DITCH COMPANY
AND
THE CITY OF COLORADO SPRINGS, ACTING BY AND THROUGH ITS ENTERPRISE, COLORADO SPRINGS UTILITIES

This **FALLOWING-LEASING PROJECT AGREEMENT** (this "Agreement") is made and entered into effective the 20 day of August, 2018, by and between the **LOWER ARKANSAS VALLEY SUPER DITCH COMPANY**, a Colorado corporation (the "Super Ditch") and the **CITY OF COLORADO SPRINGS**, a Colorado municipal corporation and home rule city, acting by and through its enterprise, **COLORADO SPRINGS UTILITIES** ("CS-U"). The Super Ditch and CS-U are sometimes referred to herein individually as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, irrigators in the Lower Arkansas River Valley incorporated the Super Ditch to provide water to meet municipal water supply needs through temporary agricultural fallowing and leasing of water and/or other alternative transfer methods ("ATMs") rather than the permanent cessation of agriculture and the sale of irrigation water rights ("Buy and Dry");

WHEREAS, the Super Ditch is in the business of providing water derived from ATMs in the Lower Arkansas River Valley to municipal entities;

WHEREAS, CS-U is a municipal utility enterprise that provides, among other things, municipal and industrial water service to customers within the City of Colorado Springs, Colorado ("Colorado Springs") and its water service area, and to other municipal and quasi-municipal entities who provide water service within the vicinity of Colorado Springs;

WHEREAS, in Case No. 10CW4, Water Division 2, the Super Ditch, jointly with the Lower Arkansas Valley Water Conservancy District (the "Lower Ark District"), applied for appropriative rights of exchange (the "10CW4 Exchange") to deliver fully-consumable water derived from ATMs under all of the major irrigation ditches and canals between Pueblo Reservoir and John Martin Reservoir to Pueblo Reservoir ("ATM Water");

WHEREAS, in Case No. 05CW96, Water Division 2, CS-U obtained a decree that, among other things, authorizes CS-U to exchange ATM Water from Pueblo Reservoir to Colorado Springs' municipal water system for use, reuse, or successive use in Colorado Springs' existing and future water service area (the "05CW96 Exchange");

WHEREAS, the Parties desire to implement a Fallowing-Leasing Pilot Project under House Bill 13-1248, codified at Section 37-60-115(8), C.R.S. (the "Pilot Project"), pursuant to which the Super Ditch will deliver ATM Water to Pueblo Reservoir under the 10CW4 Exchange, a new exchange filed cooperatively by the Parties, or by other legally available and mutually acceptable means, for use by Colorado Springs under the 05CW96 Exchange in three out of

Exhibit A

every ten years between January 1, 2020 and December 31, 2029, and up to two additional ten-year periods at the discretion of the Parties. ("Pilot Project ATM Water");

WHEREAS, the Parties contemplate that CS-U will make payment to Super Ditch for each acre-foot of Pilot Project ATM Water delivered in Pueblo Reservoir for CS-U's use, and Super Ditch will then distribute the payments to the irrigators who participate in the Pilot Project (the "Participating Irrigators");

WHEREAS, the Parties contemplate that CS-U will pay to the Super Ditch $60,000 annually during the term of the Pilot Project, which may be distributed to the Participating Irrigators as readiness to serve payments or otherwise used by the Super Ditch; and

WHEREAS, the Parties contemplate that the Super Ditch will pay the Participating Irrigators for each acre-foot of water delivered to Pueblo Reservoir for use by CS-U.

NOW THEREFORE, for good consideration, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

TERMS AND CONDITIONS

The Recitals set forth above are hereby incorporated into the Terms and Conditions of this Agreement set forth below.

1. Term

1.1. The term of this Agreement shall begin on the date it is executed by both Parties and shall continue in full force and effect until December 31, 2029. This Agreement shall automatically renew for an additional ten–year period on January 1, 2030, and again on January 1, 2040, unless terminated by one of the Parties pursuant to paragraph 9 below prior to December 1 of the year before the current ten-year period is set to expire. In no event shall the term of this Agreement extend beyond December 31, 2049.

2. ATM

2.1. The Parties acknowledge and agree that this Agreement is intended to create and give rise to an Alternative Transfer Method as defined in Colorado's State Water Plan.

2.2. The Parties acknowledge that CS-U's rights to the Pilot Project ATM Water provided under this Agreement are exclusively contractual, and that this Agreement does not give rise to any water rights or other property rights.

3. Pilot Project ATM Water

3.1. On or before November 16, 2018, the Super Ditch and CS-U will jointly apply to the Colorado Water Conservation Board for the Pilot Project pursuant to H.B. 13-1248, codified at Section 37-60-115(8), C.R.S. The Super Ditch, in cooperation with the Lower Ark District, shall prepare the application for the Pilot Project, and provide legal counsel, engineering, and other consultants necessary for the application. CS-U agrees

Exhibit A

to work cooperatively with the Super Ditch and the Lower District to provide legal and engineering review of the application as needed. Each Party shall be individually responsible for the costs it or its consultants incur in preparing and reviewing the application.

3.2. The Super Ditch and CS-U shall seek approval in the application for a Pilot Project that authorizes the Super Ditch to deliver up to 5,000 acre-feet of Pilot Project ATM Water to Pueblo Reservoir for municipal and industrial uses in CS-U's existing and future water service area in any three years between 2020 and 2029.

3.3. The Pilot Project ATM Water made available to CS-U in Pueblo Reservoir under this Agreement shall be fully consumable and made available pursuant to the requirements of H.B. 13-1248 and the procedures set forth in paragraph 29.P of the decree entered in Case No. 05CW96. The Pilot Project ATM Water shall be made up of water that can be used for municipal and industrial uses in CS-U's existing and future water service area and shall also qualify as a Class I or Class II Temporary Use Water as those terms are defined in the 05CW96 Exchange decree.

3.4. The Pilot Project ATM Water shall be delivered to Pueblo Reservoir by the Super Ditch under the priority applied for in Case No. 10CW4 or a new exchange filed in cooperation with the Lower District, or any other legally available and mutually acceptable means.

3.5. The Super Ditch shall be solely responsible for acquiring ATM Water for the Pilot Project from the Participating Irrigators pursuant to separate contracts. The Super Ditch may make actual delivery of Pilot Project ATM Water to CS-U from any source available to it at the option of the Super Ditch.

3.6. Super Ditch shall also be solely responsible, financially or otherwise, for obtaining all necessary approvals for the delivery of Pilot Project ATM Water to Pueblo Reservoir, including any necessary permits or other governmental approvals except as expressly provided otherwise in this Agreement.

3.7. The Parties understand and agree that Pilot Project ATM Water will be provided on a temporary basis and is not to be considered a permanent or perpetual supply of water for CS-U.

3.8. CS-U shall be solely responsible for delivering Pilot Project ATM Water to its municipal water system under the 05CW96 Exchange or otherwise. CS-U shall also be solely responsible, financially or otherwise, for obtaining all necessary approvals for the delivery of Pilot Project ATM Water from Pueblo Reservoir to its municipal water system, including any necessary permits or other governmental approvals.

3.9. CS-U may use Pilot Project ATM Water for any lawful purpose.

3.10. The Parties acknowledge that it may be necessary for Super Ditch to institute water court or administrative proceedings to implement the Pilot Project. So long as any such filing is consistent with the terms and intent of this Agreement, CS-U shall not oppose, but may participate as a co-applicant or file a "friendly" statement of opposition

in support of, any administrative or water court proceeding necessary to implement the Pilot Project.

4. Price

4.1. CS-U shall pay Super Ditch, for distribution by Super Ditch to the Participating Irrigators, five-hundred dollars ($500) for each acre-foot of Pilot Project ATM Water for the first 1,000 acre-feet per year delivered to Pueblo Reservoir under this Agreement. Beginning in 2021, the price paid by CS-U shall increase two percent (2%) annually, to protect Participating Irrigators against inflation. Super Ditch shall invoice CS-U upon delivery of Pilot Project ATM Water to Pueblo Reservoir. CS-U shall make payments for the delivery of any Pilot Project ATM Water into Pueblo Reservoir to Super Ditch within 90 days of the date of such invoice. Interest shall accrue on late payments at the rate of five percent (5%) per annum. Super Ditch shall be solely responsible for distributing such payments to the Participating Irrigators.

4.2. Prior to the delivery of more than 1,000 acre-feet of Pilot Project ATM Water in any year, CS-U and the Super Ditch shall agree in advance on the price per acre-foot for deliveries of more than 1,000 acre-feet of Pilot Project ATM Water per year to Pueblo Reservoir.

4.3. CS-U shall pay the Super Ditch $60,000 annually during the term of this Agreement as partial consideration for Super Ditch's delivery of up to 1,000 acre-feet of Pilot Project ATM Water to CS-U in three years out of ten..

4.4. CS-U shall make such $60,000 payments on or before March 1 of each year this Agreement is in effect. Interest shall accrue on late payments at the rate of five percent (5%) per annum.

4.5. The Parties agree that, in years the CS-U calls for the delivery of water under this Agreement, Pilot Project ATM Water will be delivered on a "take or pay" basis, provided that the Super Ditch makes the Pilot Project ATM Water legally and physically available in Pueblo Reservoir pursuant to the terms and conditions of this Agreement.

4.6. CS-U shall have no obligation to pay for any amount of Pilot Project ATM Water that was called for but not delivered pursuant to the terms and conditions of this Agreement.

4.7. In the event that the Super Ditch fails to make at least 850 acre-feet of Pilot Project ATM Water legally and physically available in Pueblo Reservoir in any year that CS-U calls for water under this Agreement, the Super Ditch shall forego the right to receive CS-U's $60,000 payment in the following year. This remedy shall apply, however, only if the failure to deliver at least 850 acre-feet of Pilot Project ATM Water is not due to an occurrence beyond the reasonable control of the Super Ditch or the Participating Irrigators such as an act of God, acts or failures to act by governmental entities, strike, war, insurrection, or orders of any court or lawful governmental administrative body or agency clothed with authority to regulate matters pertaining to water use, public health, or water quality control and so long as a failure of the Super Ditch to deliver Pilot Project ATM Water does not occur because of its affirmative action, inaction or negligence.

4.8. All payments by CS-U under this agreement shall be made as follows:

Lower Arkansas Valley Super Ditch, Inc.
801 Swink Avenue
Rocky Ford, Colorado 81067

5. Delivery of Water

5.1 CS-U shall call for delivery of a minimum of 1,000 acre-feet of Pilot Project ATM Water in three years between 2020 and 2029, and if the term of the agreement is extended, CS-U shall call for a minimum of 1,000 acre-feet of Pilot Project ATM Water in three years between 2030 and 2039, and in three years between 2040 and 2049. CS-U, in its sole discretion, shall determine which three years it will take delivery of Pilot Project ATM Water from the Super Ditch in each ten-year period. The Super Ditch shall deliver such water no later than October 31 of the year in which CS-U calls for it.

5.2 CS-U shall notify the Super Ditch of its intent to call for delivery of Pilot Project ATM Water by January 31 of any given year in which it intends to take delivery of such water under the terms and conditions of this Agreement.

5.3 In any year that CS-U calls for delivery of Pilot Project ATM Water, the Super Ditch shall make the Pilot Project ATM Water available to CS-U in Pueblo Reservoir no later than October 31 of that year.

5.4 While it is the intent and purpose of the Super Ditch to provide of Pilot Project ATM Water in response to CS-U's calls, there are some factors which make it uncertain whether the water supply can always be adequate. The Parties recognize that the water supply for the Super Ditch and its lessees is dependent upon sources from which the supply is variable in quantity and beyond the control of the Super Ditch. As long as a failure of the Super Ditch to deliver Pilot Project ATM Water does not occur because of its affirmative action, inaction or negligence, no liability in tort or contract shall attach to the Super Ditch under this Agreement on account of an actual failure of the Super Ditch to deliver Pilot Project ATM Water due to inadequate runoff or inadequate storage arising from an occurrence beyond the reasonable control of the Super Ditch, including, but not limited to, acts of God, acts or failure to act by governmental entities, strike, war, insurrection, or inability to delivery water arising from the order of any court or a lawful order of any governmental administrative body or agency clothed with authority to regulate matters pertaining to water use, public health, or water quality control. If Super Ditch anticipates an inability to meet a call from CS-U (for example, in the event of drought or failure of infrastructure), it shall provide notice of such interruption to CS-U at the earliest time practicable.

6. Storage of Water

6.1. The Super Ditch shall be responsible for providing the necessary storage space for all Pilot Project ATM Water that is delivered to CS-U in Pueblo Reservoir until such time as the water is moved out of storage by CS-U under the 05CW96 Exchange or otherwise;

provided that, in no event, shall the Super Ditch be required to store CS-U's Pilot Project ATM Water in Pueblo Reservoir after December 31 of the year in which the water was delivered to CS-U. However, if CS-U desires to store its Pilot Project ATM Water for a longer term in Pueblo Reservoir, the parties shall cooperate with each other to secure storage of such water in the Long-Term Excess Capacity Storage Account maintained by the Lower Ark District.

6.2. CS-U shall bear any evaporative and transit losses incurred after the water is delivered into Super Ditch's storage space in Pueblo Reservoir.

7. Future Commitments

7.1. Both parties acknowledge CS-U's need to plan for and secure a perpetual water supply for its customers; and both Parties acknowledge the Super Ditch's desire to preserve irrigated agricultural in the Lower Arkansas Valley. Towards these ends, the Parties agree to meet at least annually with the Lower Ark District to revisit the terms of this Agreement, and the operation of the Pilot Project. Topics to address at these meetings include, but are not limited to, the use of conservation easements, covenants, or other real property interests to secure a permanent supply of leased water; an application for conditional rights of exchange to secure a permanent means of transporting Pilot Project ATM Water to Pueblo Reservoir; use of SWSPs and IWSAs to increase both the number of years in ten that CS-U can call for Pilot Project ATM Water, and the amount of Pilot Project ATM Water that CS-U can call for annually; and the extension of the Pilot Project into a long-term agreement between CS-U, the Super Ditch, and the Lower Ark District.

8. Notice

8.1. Any notice required under this agreement shall be in writing and shall be delivered by courier service delivery (such as Federal Express), by first-class mail, or by electronic mail at the addresses specified below and shall be deemed duly served, given, or delivered when received:

If to the Super Ditch:

Lower Arkansas Valley Super Ditch Company
Attn: President
801 Swink Avenue
Rocky Ford, CO 81067

Electronic Mail Address (c/o General Manager, Lower Arkansas Valley Water Conservancy District):
jwinner@lowerark.com

Exhibit A

With copies to:

Lower Arkansas Valley Water Conservancy District
Attn: General Manager
810 Swink Avenue
Rocky Ford, CO 81067

Bart Mendenhall
Mendenhall & Malouf
805 Chestnut
P.O. Box 52
Rocky Ford, CO 81067

Peter D. Nichols
Berg Hill Greenleaf Ruscitti LLP
1712 Pearl St.
Boulder, CO 80302

If to CS-U:

Courier Service Address:
Colorado Springs Utilities
ATTN: Chief Water Services Officer
121 S. Tejon St., 5th Floor
Colorado Springs, CO 80903

United States Postal Service Address:
Colorado Springs Utilities
ATTN: Chief Water Services Officer
P.O. Box 1103
Colorado Springs, CO 80947-0950

Electronic Mail Address:
ewilkinson@csu.org

City Attorney's Office - Utilities Division
Courier Service Address:
City Attorney's Office - Utilities Division
30 S. Nevada Ave, Suite 501
Colorado Springs, CO 80903

United States Postal Service Address:
City Attorney's Office - Utilities Division
P.O. Box 1575, Mail Code 510
Colorado Springs, CO 80901-1575

Electronic Mail Address:
mgustafson@springsgov.com

8.2. Any Party may change the above addresses for any reason by providing notice in writing to the other Party.

9. Enforcement and Termination

9.1. This Agreement may be terminated only as described herein, or upon mutual agreement of the Parties.

9.2. It is specifically understood that, by executing this Agreement, each Party commits itself to perform pursuant to the terms and conditions contained herein and that the failure of any Party to fulfill any obligation set forth herein shall constitute a breach of this Agreement. The Parties agree that this Agreement may be enforced in law or in equity for specific performance, injunctive, or other appropriate relief, as may be available according to the laws and statutes of the State of Colorado. A Party may terminate this Agreement based on the other Party's breach of a material term or condition of this Agreement, upon providing thirty (30) days written notice of such breach to the other Party, if the breaching Party fails to cure the breach within ninety (90) days of the date it receives notice of breach from the other Party.

9.3. Either Party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by a cause beyond its control, including, but not limited to, any incidence of fire, flood, or strike; acts of God; acts of the Government (except the Parties hereto); war or civil disorder; violence or the threat thereof; severe weather; commandeering of material, products, plants, or facilities by the federal, state, or local government (except the Parties hereto); or national fuel shortage, when satisfactory evidence of such cause is presented to the other Parties, and provided further, that such nonperformance is beyond the reasonable control of, and is not due to the fault or negligence of, the Party not performing.

9.4. Either Party may terminate this Agreement without cause by providing the other Party with notice of such termination prior to December 1 of the year before the current ten-year period of the Agreement is set to expire. Such termination shall be effective as of the date the current ten-year period expires.

10. Miscellaneous

10.1. Except as expressly provided hereunder, each Party shall bear its own fees and expenses incurred in the formation of this Agreement.

10.2. No provision, covenant or agreement contained in this Agreement, nor any obligations herein imposed upon CS-U shall constitute or create an indebtedness or debt of CS-U or the City of Colorado Springs within the meaning of any Colorado constitutional provision or statutory limitation.

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10.3. The Parties will fulfill their obligations under this Agreement in compliance with all applicable laws and with the highest standards of integrity, fair dealing, respect and ethics. The Parties will fulfill their obligations under the Agreement without discriminating, harassing, or retaliating on the basis of race, color, national origin, ancestry, sex, age, pregnancy status, religion, creed, disability, sexual orientation, genetic information, spousal or civil union status, veteran status, or any other status protected by applicable law.

10.4. In accordance with the Colorado Springs City Charter, performance of CS-U's obligations under this Agreement are expressly subject to appropriations of funds by the City Council. In the event funds are not appropriated in whole or in part sufficient for performance of CS-U's obligations under this Agreement, or appropriated funds may not be expended due to City Charter spending limitations, then this Agreement shall thereafter become null and void by operation of law, and CS-U shall thereafter have no liability for compensation or damages to the Super Ditch in excess of CS-U's authorized appropriation for this Agreement or the applicable spending limit, whichever is less.

10.5. Notwithstanding any language in this Agreement or any representation or warranty to the contrary, none of the Parties shall be deemed or constitute a partner, joint venturer or agent of the other Parties. Any actions taken by the Parties pursuant to this Agreement shall be deemed actions as an independent contractor of the other.

10.6. Nothing in this Agreement or in any actions taken by the Parties pursuant to this Agreement shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections or other provisions of the Colorado Governmental Immunity Act, Section 24-10-101, *et seq.*, C.R.S., as from time to time may be amended.

10.7. This Agreement shall inure to and be binding on the heirs, executors, administrators, successors, and assigns of the Parties. It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement and all rights of action relating to such enforcement shall be strictly reserved to the Parties. It is the express intention of the Parties that any person other than the Parties shall be deemed to be only an incidental beneficiary under this Agreement, including the Super Ditch's members and shareholders.

10.8. Neither this Agreement, nor either Party's rights and obligations under this Agreement shall be assignable, except on mutual written agreement of the parties.

10.9. This Agreement may not be amended, altered, or otherwise changed except by a subsequent written agreement by the Parties.

10.10. This Agreement shall be construed in accordance with the laws of the State of Colorado (without reference to conflicts of laws) and to the extent necessary to recognize the legal organization of CS-U, the Colorado Springs City Charter, Colorado Springs City Code, City ordinances and resolutions, and City rules and regulations. In the event of litigation, this Agreement shall be enforceable by or against the City of Colorado Springs on behalf of CS-U as provided in Colorado Springs City Code

Section 12.1.108. In the event of any dispute over the terms and conditions of this Agreement, the exclusive venue and jurisdiction for any litigation arising hereunder shall be in the District Court of El Paso County, Colorado, and, if necessary for exclusive federal questions, the United States District Court for the District of Colorado.

10.11. No waiver of any of the provisions of this Agreement shall be deemed to constitute a waiver of any other of the provisions of this Agreement, nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein, nor shall the waiver of any default hereunder be deemed a waiver of any subsequent default hereunder.

10.12. This Agreement constitutes the entire agreement between the Parties and sets forth the rights, duties, and obligations of each to the other as of this date. Any prior agreements, promises, negotiations, or representations not expressly set forth in this Agreement are of no force and effect.

[*the remainder of this page intentionally left blank*]

IN WITNESS WHEREOF, the Parties have executed this Agreement on the date first above written. By the signature of its representative below, each party affirms that it has taken all necessary action to authorize said representative to execute this Agreement.

LOWER VALLEY SUPER DITCH COMPANY

John Schweizer, Jr., President

Attest:

COLORADO SPRINGS UTILTIES

Earl Wilkinson, III
Chief Water Services Officer

Approved as to Form:

Michael J. Gustafson
City Attorney's Office – Utilities Division

Exhibit A

Colorado Springs Utilities
It's how we're all connected

August 16, 2019

John Schweizer, Jr.
President
Lower Arkansas Valley Super Ditch Company
810 Swink Avenue
Rocky Ford, CO 81067

Re: Letter Agreement concerning the Replacement of Return Flows for the CS-U/Super Ditch Pilot Project

Dear Mr. Schweizer:

I. Introduction

On August 20, 2018, the Lower Arkansas Valley Super Ditch Company (the "Super Ditch") and the City of Colorado Springs, acting by and through its enterprise, Colorado Springs Utilities ("CS-U") entered into a Fallowing-Leasing Project Agreement (the "Pilot Project Agreement"), pursuant to which, the parties[1] agreed to implement a Fallowing-Leasing Pilot Project under House Bill 13-1248, codified at Section 37-60-115(8), C.R.S. (the "CS-U/Super Ditch Pilot Project"). Under the Pilot Project Agreement, the Super Ditch agreed, *inter alia*, to deliver to CS-U one-thousand (1,000) acre-feet of fully-consumable water in Pueblo Reservoir (the "Pilot Project ATM Water") in three (3) out of ten (10) years (of CS-U's choosing) between 2020 and 2029 (the "Delivery Years").[2] In November, 2018, the parties submitted a Pilot Project Proposal for the CS-U/Super Ditch Pilot Project to the Colorado Water Conservation Board ("CWCB"); the parties anticipate that they will submit a Pilot Project Application for the CS-U/Super Ditch Pilot Project to the CWCB in August, 2019.

In order to deliver Pilot Project ATM Water to CS-U, the Super Ditch has entered into temporary-fallowing agreements ("TFAs") with certain irrigators who own shares of stock in the Catlin Canal Company and farm under the Catlin Canal (the "Participating Irrigators"). To implement the TFAs, the Participating Irrigators have agreed to, *inter alia*, cease irrigation on and temporarily fallow certain farm parcels during the Delivery Years (the "Fallowed Farms"), and allow Super Ditch to temporarily change the use of the shares of stock in the Catlin Canal Company that have been historically used on the Fallowed Farms to include municipal uses by CS-U (the "Fallowed Shares"). To implement this temporary change of water rights, the Super Ditch must, *inter alia*, develop a plan to replace, in time, location, and amount, the historic return

[1] The Super Ditch and/or CS-U may be referred to herein, collectively, as the "parties" or, individually, as a "party."

[2] The Pilot Project Agreement contains various options through which it may be extended until 2049; and expanded to include deliveries of up to 5,000 acre-feet of water in Delivery Years.

1521 South Hancock Expressway
P.O. Box 1103, Mail Code 1825
Colorado Springs, CO 80947-1825

Phone 719.448.8888
www@csu.org

flows associated with the use of the Fallowed Shares on the Fallowed Farms (the "Historic Return Flows"). The Historic Return Flows consist of two components: runoff that returns to the river via surface flows ("Surface Runoff") and deep percolation that returns to the river via groundwater flows ("Delayed Return Flows").

As part of the Pilot Project Proposal, the parties agreed to investigate the use of physical exchanges of water into CS-U's municipal system to facilitate the replacement of some or all of the Delayed Return Flows. Specifically, the Pilot Project Proposal contemplated that:

> An exchange concept for replacing delayed return flows may also be implemented as part of the CS-U/ Super Ditch Pilot Project, subject to further analysis during the application process. During operation of this pilot project, water to replace delayed return flows may ultimately be exchanged upstream to Pueblo Reservoir along with the consumptive use water. The delayed return flow water would be considered fully consumable and transferred to CS-U. CS-U could then make all of the required delayed return flow releases to the Arkansas River from fully consumable sources it has available to it. Conducting this operation as an exchange would maintain the fully consumable character of the water being used to replace delayed return flows.

Since submitting the Pilot Project Proposal, the parties have further analyzed the feasibility of this exchange concept. Based on this analysis, the parties believe that this exchange concept is technically feasible, and wish to propose it as part of the Pilot Project Application. The purpose of this Letter Agreement is to memorialize the parties' agreement with respect to the operation of this exchange concept for the purposes of the Pilot Project Application.

II. Letter Agreement

1. The parties anticipate that, for the purposes of temporarily changing the use of the Fallowed Shares, the Super Ditch will quantify the amounts of HCU, Surface Return Flows, and Delayed Return Flows attributable to the historic use of Fallowed Shares on the Fallowed Farms as deliveries occur pursuant to engineering protocols developed in the Pilot Project Application and subsequently approved by the CWCB (the "Pilot Project Engineering"). With respect to the replacement of the Delayed Return Flows, the Pilot Project Engineering will include a schedule quantifying the monthly deliveries to the Arkansas River necessary to replace the Delayed Return Flows in time, location and amount (the "Monthly Delayed Return Flow Obligations") over an approximately five (5) year period (the "Lagging Period").

2. In Delivery Years, the Super Ditch shall take delivery of the HCU attributable to the Fallowed Shares and use this water to deliver Pilot Project ATM Water to CS-U as set forth in detail in the Pilot Project Agreement. The Super Ditch shall deliver, and CS-U shall take delivery of, the Pilot Project ATM Water as set forth in the Pilot Project Agreement. This Letter Agreement is not intended to, nor does it modify, the parties' obligations with respect to the Pilot Project ATM Water under the Pilot Project Agreement.

3. In Delivery Years, the Super Ditch shall take delivery of the Surface Return Flows attributable to the Fallowed Shares and return these to the Arkansas River in time, location, and amount as required by the Pilot Project Engineering. CS-U shall have no obligation to replace the Surface Return Flows.

4. In Delivery Years, the Super Ditch shall take deliveries of water in an amount equal to the Delayed Return Flows attributable to the Fallowed Shares in excess of the amount owed the same month of delivery and, in lieu of returning this water to the Arkansas River through recharge facilities or other methods, the Super Ditch shall, at no cost to CS-U, exchange this water to Pueblo Reservoir for municipal uses by CS-U (the "Pilot Project Replacement Water"). The Pilot Project Replacement Water shall be fully consumable in CS-U's municipal system and made available pursuant to the procedures set forth in paragraph 29.P of the decree entered in Case No. 05CW96. Within 30 days of the delivery of any Pilot Project Replacement Water to Pueblo Reservoir, the Super Ditch shall provide a schedule to CS-U specifying the additional and cumulative Delayed Return Flow Obligations during the Lagging Period as a result of the delivery of such Pilot Project Replacement Water and the previous operations of the CS-U/Super Ditch Pilot Project (the "Projection of Delayed Return Flows Owed to the River.").

5. CS-U shall coordinate with the Division Engineer to replace the Monthly Delayed Return Flow Obligations during the Lagging Period in time, location, and amount by making releases of water from Lake Meredith or other facilities available to CS-U as specified in the Projection of Delayed Return Flows Owed to the River using fully consumable sources of water legally and physically available to CS-U in Lake Meredith or such other facilities. CS-U shall not be required to replace any of the Monthly Delayed Return Flow Obligations not shown in the Projection of Delayed Return Flows Owed to the River.

6. The Super Ditch shall be solely responsible for acquiring the Pilot Project Replacement Water from the Participating Irrigators, or otherwise, pursuant to separate contracts. Super Ditch shall also be solely responsible, financially or otherwise, for obtaining all necessary approvals for the delivery of Pilot Project Replacement Water to Pueblo Reservoir, including any necessary permits or other governmental approvals.

7. CS-U shall be solely responsible for delivering Pilot Project Replacement Water to its municipal water system under the Exchange decreed in Case No. 05CW96 (Div. 2) (the "05CW96 Exchange") or otherwise. CS-U shall also be solely responsible, financially or otherwise, for obtaining all necessary approvals for the delivery of Pilot Project Replacement Water from Pueblo Reservoir to its municipal water system, including any necessary permits or other governmental approvals. CS-U may use Pilot Project Replacement Water for any lawful purpose.

8. The Super Ditch shall be responsible for providing the necessary storage space for all Pilot Project Replacement Water that is delivered to CS-U in Pueblo Reservoir until such time as the water is moved out of storage under the 05CW96 Exchange or otherwise; provided that, in no event, shall the Super Ditch be required to store CS-U's Pilot Project Replacement Water in Pueblo Reservoir after December 31 of the year in which the water was delivered to CS-U. However, if CS-U desires to store its Pilot Project Replacement Water for a longer term in Pueblo Reservoir, the parties shall cooperate with each other to secure storage of such water in the Long-Term Excess Capacity Storage Account maintained by the Lower Arkansas Valley Water

Conservancy District. CS-U shall bear any evaporative and transit losses incurred after the Pilot Project Replacement Water is delivered into Super Ditch's storage space in Pueblo Reservoir.

9. CS-U shall be solely responsible for delivering fully-consumable water to the Arkansas River in time, location, and amount to meet the Monthly Delayed Return Flow Obligations during the Lagging Period.

10. This Letter Agreement is contingent upon the following:

a. The CWCB and the State and Division Engineers must approve the operations set forth in this Letter Agreement as part of the CS-U/Super Ditch Pilot Project.

b. The Pilot Project Replacement Water must qualify as a Class I or Class II Temporary Use Water as those terms are defined in the Decree entered in Case No. 05CW96 (Div. 2).

c. CS-U must be authorized by the CWCB, the State and Division Engineers, and any other governmental or administrative body with authority over the operations described in this Letter Agreement to make releases from Lake Meredith to meet the Monthly Delayed Return Flow Obligations during the Lagging Period (although CS-U may, in its sole discretion, make releases from other facilities).

d. CS-U must approve any accounting procedures used to account for Pilot Project Replacement Water and the operations contemplated by this Letter Agreement; provided that such approval shall not be unreasonably withheld.

If any of the above contingencies are not satisfied, CS-U must provide written notice to the Super Ditch of the deficiency and provide the Super Ditch with ten days to cure the deficiency. If the Super Ditch does not cure the deficiency within ten days of receipt of said written notice, then this Letter Agreement shall be null and void, and the Super Ditch shall be responsible for meeting the Monthly Delayed Return Flow Obligations during the Lagging Period at its sole expense.

11. The term of this Letter Agreement shall remain in effect during the term of the Pilot Project, unless terminated under the terms of this Letter Agreement.

12. This Letter Agreement does not modify or change the Pilot Project Agreement except as specifically set forth herein.

13. The signors to this Letter Agreement represent and warrant that they are entitled to bind their respective organizations.

14. Except as expressly provided hereunder, each Party shall bear its own fees and expenses incurred in the formation of this Agreement.

15. It is specifically understood that, by executing this Letter Agreement, each party commits itself to perform pursuant to the terms and conditions contained herein and that the failure of any party to fulfill any obligation set forth herein shall constitute a breach of this Letter Agreement. The parties agree that this Letter Agreement may be enforced in law or in equity for specific performance, injunctive, or other appropriate relief, as may be available according to the

laws and statutes of the State of Colorado. A party may terminate this Letter Agreement based on the other party's breach of a material term or condition, upon providing thirty (30) days written notice of such breach to the other party, if the breaching party fails to cure the breach within ninety (90) days of the date it receives notice of breach from the other party.

Either Party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by a cause beyond its control, including, but not limited to, any incidence of fire, flood, or strike; acts of God; acts of the Government (except the parties hereto); war or civil disorder; violence or the threat thereof; severe weather; commandeering of material, products, plants, or facilities by the federal, state, or local government (except the parties hereto); or national fuel shortage, when satisfactory evidence of such cause is presented to the other parties, and provided further, that such nonperformance is beyond the reasonable control of, and is not due to the fault or negligence of, the party not performing.

16. No provision, covenant or agreement contained in this Agreement, nor any obligations herein imposed upon CS-U shall constitute or create an indebtedness or debt of CS-U or the City of Colorado Springs within the meaning of any Colorado constitutional provision or statutory limitation.

17. In accordance with the Colorado Springs City Charter, performance of CS-U's obligations under this Agreement are expressly subject to appropriations of funds by the City Council. In the event funds are not appropriated in whole or in part sufficient for performance of CS-U's obligations under this Agreement, or appropriated funds may not be expended due to City Charter spending limitations, then this Agreement shall thereafter become null and void by operation of law, and CS-U shall thereafter have no liability for compensation or damages to the Super Ditch in excess of CS-U's authorized appropriation for this Letter Agreement or the applicable spending limit, whichever is less.

18. Notwithstanding any language in this Letter Agreement or any representation or warranty to the contrary, none of the parties shall be deemed or constitute a partner, joint venturer or agent of the other parties. Any actions taken by the parties pursuant to this Letter Agreement shall be deemed actions as an independent contractor of the other.

19. Nothing in this Letter Agreement or in any actions taken by the parties pursuant to this Agreement shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections or other provisions of the Colorado Governmental Immunity Act, Section 24-10-101, *et seq.*, C.R.S., as from time to time may be amended.

20. Neither this Letter Agreement, nor either party's rights and obligations under this Letter Agreement shall be assignable, except on mutual written agreement of the parties.

21. This Letter Agreement may not be amended, altered, or otherwise changed except by a subsequent written agreement by the parties.

22. This Letter Agreement shall be construed in accordance with the laws of the State of Colorado (without reference to conflicts of laws) and to the extent necessary to recognize the legal organization of CS-U, the Colorado Springs City Charter, Colorado Springs City Code, City ordinances and resolutions, and City rules and regulations. In the event of litigation, this

Letter Agreement shall be enforceable by or against the City of Colorado Springs on behalf of CS-U as provided in Colorado Springs City Code Section 12.1.108. In the event of any dispute over the terms and conditions of this Letter Agreement, the exclusive venue and jurisdiction for any litigation arising hereunder shall be in the District Court of El Paso County, Colorado, and, if necessary for exclusive federal questions, the United States District Court for the District of Colorado.

23. This Letter Agreement constitutes the entire agreement between the parties with respect to the operation of the exchange concept for the purposes of the Pilot Project Application and sets forth the rights, duties, and obligations of each to the other as of this date. Any prior agreements, promises, negotiations, or representations related to operation of the exchange concept that are not expressly set forth in this Letter Agreement or the Pilot Project Agreement are of no force and effect.

24. Any notices required under this Letter Agreement shall be provided to the other party in the manner described in paragraph 8 of the Pilot Project Agreement.

25. It is expressly understood and agreed that enforcement of the terms and conditions of this Letter Agreement and all rights of action relating to such enforcement shall be strictly reserved to the parties. It is the express intention of the parties that any person other than the parties shall be deemed to be only an incidental beneficiary under this Letter Agreement, including the Super Ditch's members and shareholders.

26. No waiver of any of the provisions of this Letter Agreement shall be deemed to constitute a waiver of any other of the provisions of this Letter Agreement, nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein, nor shall the waiver of any default hereunder be deemed a waiver of any subsequent default hereunder.

Sincerely,

Earl Wilkinson, III
Chief Water Services Officer
Colorado Springs Utilities

APPROVED AS TO FORM:
CITY ATTORNEYS OFFICE
UTILITIES DIVISION

Cc: Gerry Knapp
Megan Gutwein
Abby Ortega
Michael Gustafson
David Robbins
Matthew Montgomery

Agreed to and Acknowledged by:

_____

John Schweizer, Jr.
President, Lower Arkansas Valley Super Ditch Company

October 15, 2019

Mr. William Caile
Holland & Hart
555 17th Street, Suite 3200
Denver, CO 80202

RE: Comments on City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project

Dear Mr. Caile,

On behalf of Five Rivers Cattle Feeding LLC, d/b/a Colorado Beef (Colorado Beef), Leonard Rice Engineers, Inc. (LRE) has performed a technical review of documents related to the HB13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) pilot project involving the use of Catlin Canal Shares by City of Colorado Springs (Colorado Springs/Super Ditch Catlin Canal pilot project). The Colorado Springs/Super Ditch Catlin Canal pilot project was designed based on the criteria and guidelines for fallowing-leasing pilot projects developed by the Colorado Water Conservation Board (CWCB) and Colorado Division of Water Resources (DWR), amended and approved by the CWCB on January 25, 2016.

Colorado Beef owns direct flow water rights in the Fort Lyon Canal and decreed underground water rights for wells located downstream of John Martin Reservoir that divert water tributary to the Arkansas River. The points of diversion associated with these water rights are downstream from the Colorado Springs/Super Ditch Catlin pilot project. Without adequate terms and conditions, operation of the Colorado Springs/Super Ditch Catlin Canal pilot project could injure Colorado Beef's water rights.

Documents reviewed by LRE in support of this technical review include:

- Berg Hill Greenleaf & Ruscitti LLP. Re: HB 13-1248 Colorado Springs Utilities Pilot Project Proposal for CWCB Selection. Letter to CWCB. Dated November 16, 2018.
- CWCB and DWR. Criteria and Guidelines for Fallowing-Leasing Pilot Projects. Amended and Approved by CWCB: January 25, 2016.
- Martin & Wood Water Consultants, Inc. Re: HB 13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project Use of Catlin Canal Shares by City of Colorado Springs. Letter to Ms. Megan Gutwein. Dated August 16, 2019.

Based on review of the above sources we provide the following questions and comments on the Colorado Springs/Super Ditch Catlin Canal pilot project. LRE reserves the right to update, revise, or supplement these comments as additional information becomes available.

- Additional clarification is needed regarding the requirement that deliveries for Colorado Springs will cease when 1,000 acre-feet of consumptive use water is delivered to Pueblo Reservoir. Is this an annual limit? Does historical consumptive use water delivered to Pueblo Reservoir in a prior year and remaining in storage in Pueblo Reservoir in the current year, count toward this 1,000 acre-feet limit? It has been identified that stepped exchanges may be utilized when insufficient exchange potential exists to exchange water to Pueblo Reservoir. Does water stored in alternative locations as a result of stepped exchanges count toward this 1,000 acre-foot limit?

- Additional clarification is needed regarding Colorado Springs' Supplies for Return Flow Replacement shown in Table 9. Based on the table footnote (*Colorado Spring' average annual diversions), this table suggests that the full diversion amount associated with 28,012.76 shares of Colorado Canal Company is fully consumable. Does the 16,057 acre-feet of average annual yield for the Colorado Canal Company represent the average annual diversion, the fully consumable portion of the diversions, or both? Further, the table suggests that in an average year Colorado Springs' has available 23,360 acre-feet of total reusable return flows; however, only 16,257 acre-feet has been shown for the sources identified in the table. What are the sources of the remaining 7,103 acre-feet of supplies for return flow replacements?

- To move water up the river, the pilot project may use a variety of stepped exchanges. These stepped exchanges will involve the delivery of water down irrigation ditches (eg Holbrook Canal) and storage of water in reservoirs. A portion of the water that is conveyed down irrigation ditches or stored in reservoirs will be lost due to transit losses and evaporation. In recognition of these losses, and to prevent an expansion of use, the Colorado Springs/Super Ditch Catlin Canal pilot project should include a Term and Condition requiring that water exchanged via stepped exchanges and later released is subject to losses including transit loss and evaporation.

Sincerely,

LEONARD RICE ENGINEERS, INC.

Mary L. Presecan, P.E.
Project Manager

935CBE02
mlp

BEFORE THE COLORADO WATER CONSERVATION BOARD
STATE OF COLORADO

HB 13-1248 CITY OF COLORADO SPRINGS/SUPER DITCH (FALLOWING-LEASING) PILOT PROJECT

COMMENTS BY THE SOUTHEASTERN COLORADO WATER CONSERVANCY DISTRICT

The Southeastern Colorado Water Conservancy District ("Southeastern") submits the following comments, consistent with the Criteria and Guidelines for Fallowing-Leasing Pilot Projects adopted by the Colorado Water Conservation Board ("CWCB") and Colorado Division of Water Resources ("DWR") on November 19, 2013, and amended on January 25, 2016, regarding the HB 13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project ("CS/SDFLPP").

1. Southeastern is a statutory water conservancy district (*see* C.R.S. §§ 37-45-101, *et seq*.), which includes within its boundaries most of the municipalities and irrigated land in the Arkansas River Valley in Colorado. Southeastern administers and repays reimbursable costs for the Fryingpan-Arkansas Project, a $550 million multi-purpose reclamation project authorized by Congress and built by the U.S. Bureau of Reclamation, and holds all water rights for the Project, except certain rights in Ruedi Reservoir. The Project diverts water underneath the Continental Divide, from the Fryingpan and Roaring Fork River drainages, which are tributaries to the Colorado River, into the Arkansas River drainage, where Project water is stored in a series of reservoirs, including Pueblo Reservoir. Southeastern repays a large part of the Project's construction costs (estimated at $127 million), as well as annual operation and maintenance costs, in accordance with its repayment contract with the United States. Payments are made primarily from property tax revenues available to Southeastern.

2. Southeastern is interested in this matter as an owner of water rights within the Arkansas and Colorado River Basins and as the repayment entity for the Fryingpan-Arkansas Project. These water rights include the water storage right for Pueblo Reservoir decreed in 1962 in Case No. B-42135 (Pueblo County District Court), and the Winter Water Storage Program as decreed in Case No. 84CW179 (Water Div. 2). In addition, as administrator of the Fryingpan-Arkansas Project water rights, Southeastern is party to numerous agreements with the Bureau of Reclamation, the Colorado Department of Natural Resources, local governments, quasi-municipal entities and private parties. These agreements relate to operation and use of the Fryingpan-Arkansas Project facilities, distribution and sale of Project water and voluntary maintenance of Arkansas River stream flows for recreational purposes.

3. Southeastern is generally supportive of the CS/SDFLPP, and believes the CS/SDFLPP generally will provide a reasonable basis for testing a pilot project. However, Southeastern is concerned about the potential impact of the CS/SDFLPP on its operations and existing agreements.

4. The application proposes to use Pueblo Reservoir, a Fryingpan-Arkansas Project facility. Such use requires a contract and the Pilot Project must operate within the scope of such contract(s). Paragraph 25 of the proposed terms and conditions acknowledges the need for contracts when determining who can use Fryingpan-Arkansas ("Fry-Ark") facilities, and paragraph 26 recognizes that any approval will not give rights to use facilities. These terms are appropriate but insufficient. Section II F (page 14) explains the Lower Arkansas Valley Water Conservancy District's ("LAVWCD") contract and Southeastern's master contract for excess capacity storage in the Fry-Ark facilities, and use of that storage to replace return flows. However, no mention is made of CS-U's contract with the United States for use of Project facilities. The Applicants should clarify whether any of the water will be stored in Pueblo Reservoir under CS-U's contract, or only under the LAVWCD subcontract. Southeastern requests that the terms and conditions require that the Pilot Project will be operated consistent with the LAVWCD's subcontract with the Southeastern Colorado Water Conservancy District for excess capacity storage. Such terms and conditions should also require that the Pilot Project will be operated consistent with Colorado Springs Utilities' contract with the U.S. Bureau of Reclamation, unless the Applicants can demonstrate that contract is not applicable.

5. Paragraph 28 addresses use of the Winter Water Storage Program ("WWSP") to replace return flow obligations. Southeastern requests the terms and conditions include the following additional standard language to protect the WWSP:

a. During the Winter Water Storage Program storage season (November 15 through March 14), LAVWCD and Super Ditch shall not operate any exchange to Pueblo Reservoir. (This term is consistent with the decree in Case No. 10CW04.)

b. The portion of the water Applicants store in Pueblo Reservoir pursuant to this Pilot Project that is derived from water stored pursuant to the decree dated November 10, 1990 in Case No. 84CW179 ("Winter Water") shall be stored in LAVWCD's excess capacity space in Pueblo Reservoir. If no excess capacity storage is available in a given year, Applicants will not have Winter Water available in Pueblo Reservoir for this Pilot Project during that year.

c. All of Applicants' Winter Water shall be delivered through the Catlin Canal during the period of March 16 through November 14, at the same time as deliveries of Winter Water are made to Catlin shareholders. Any Winter Water stored in Pueblo Reservoir pursuant to this Pilot Project will be stored pursuant to the applicable rules, regulations, contracts and policies in effect from time to time for storage of Winter Water.

d. Nothing in any approval of this Pilot Project authorizes storage of Winter Water contrary to the requirements and limitations of the Decree in Case No. 84CW179 and the contract between the United States and Southeastern Colorado Water Conservancy District.

6. Southeastern, Colorado Springs and others are parties to a May 2004 Intergovernmental Agreement ("IGA"), including Exhibit 1 to the IGA that outlines the "Arkansas River Flow Management Program" that contemplates certain river operations by the parties. Moreover, Lower Ark has a 2011 MOA with Southeastern that obligates Lower Ark to comply with the requirements of the Arkansas River Flow Management Program to the same extent that Southeastern is obligated to comply in the event that a long-term excess capacity contract is entered into with Reclamation and Lower Ark enters into a sub-contract with Southeastern for use of the excess capacity space, both of which events have occurred. The proposed terms and conditions address some of the Pueblo Flow Management Program requirements in paragraph 15, and confirm in paragraph 17 that the exchanges will comply with all terms and conditions of the Super Ditch Exchange Decree (Case No. 10CW4). Southeastern requests the following additional term to assure protection of the Arkansas River Flow Management Program:

> Any exchange to Pueblo Reservoir made in connection with this Pilot Project shall be subject to all of Colorado Springs's obligations under the Intergovernmental Agreement among the Cities of Pueblo, Fountain, Colorado Springs and Aurora, the Southeastern Colorado Water Conservancy District and the Board of Water Works of Pueblo, effective May 27, 2004, as such agreement may be amended from time to time ("Regional IGA").

7. Section II E discusses sources of water used to replace historical return flows, which are listed in Tables 9 and 10 and do not include Fry-Ark Project water. Similarly, Paragraph 26 of the proposed terms and conditions acknowledges Applicants' understanding that the CS/SDFLPP will not confer any right to use Project water. Southeastern requests an express condition that Applicants will not use any Fry-Ark Project water to replace historical return flows in this Pilot Project. Southeastern requests the following term to confirm Fry-Ark Project water will not be used for this purpose:

> Applicants shall not use Fryingpan-Arkansas Project Water or Project Water Return Flows for maintenance of return flows from irrigation use of any water rights utilized in this Pilot Project.

8. Southeastern's comments on the current CS/SDFLPP are contained herein. Nothing in these comments, nor any omission, limits Southeastern's right to make further comments on the CS/SDFLPP or any engineering associated therewith.

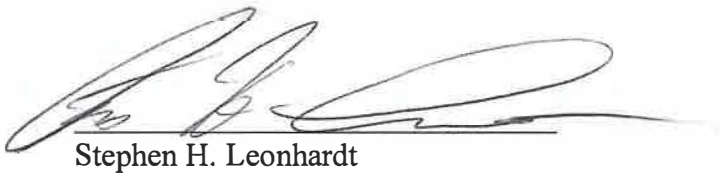
9. Southeastern reserves the right to raise objections raised by other parties in their comments but not repeated here.

10. Additional grounds of objection or comment may be identified as Southeastern learns more about the CS/SDFLPP.

11. Southeastern requests service of any notices, reports, determination and decision by electronic mail to the email address shown in the signature block below.

Respectfully submitted this 15th day of October 2019.

BURNS, FIGA & WILL, P.C.



Stephen H. Leonhardt
BURNS, FIGA & WILL, P.C.
6400 South Fiddlers Green Circle
Suite 1000
Greenwood Village, CO 80111
Phone: (303) 796-2626
Fax: (303) 796-2777
E-mail: sleonhardt@bfwlaw.com

CERTIFICATE OF MAILING

I certify that on October 15, 2019, a true and correct copy of the Comments by the Southeastern Colorado Water Conservancy District concerning **HB 13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project**, together with all accompanying materials, was served via email to:

Megan Gutwein Berg, Hill, Greenleaf, Ruscitti, LLP	mg@bhgrlaw.com
Michael J. Gustafson Colorado Springs City Attorneys' Office	mgustafson@springsgov.com

Stephen H. Leonhardt

Hendrix Wai Engineering, Inc.

Water Resources, Water Rights and GIS/Computer Modeling

P.O. Box 4487
Parker, CO 80134
Telephone: (720) 930-4360

E-Mail: Randy@Hendrix-Wai.com
E-Mail: Ayrton@Hendrix-Wai.com
Fax: (720) 930-4386

To: Richard Mehren – Moses, Wittemyer, Harrison & Woodruff, P.C.
Jennifer DiLalla – Moses, Wittemyer, Harrison & Woodruff, P.C.
John Peckler – Moses, Wittemyer, Harrison & Woodruff, P.C.

From: Randy L. Hendrix P.E., Ayrton M. Hendrix E.I.

Date: October 15, 2019

Subject: Lower Arkansas Water Management Association's Comments on the HB 13-1248 City of Colorado Springs/Super Ditch (Fallowing-Leasing) Pilot Project - Use of Catlin Canal Shares by City of Colorado Springs

Introduction

On behalf of the Lower Arkansas Water Management Association (LAWMA), this memorandum provides our comments on the HB 13-1248 City of Colorado Springs / Super Ditch Pilot Project Application submitted by the Lower Arkansas Valley Super Ditch Company (Super Ditch) and the City of Colorado Springs, acting by and through its enterprise, Colorado Springs Utilities (CS-U) on August 16, 2019. Super Ditch and CS-U (Applicants) are requesting approval of a pilot project to use consumptive use credits from shares in the Catlin Canal Company to provide a temporary supply of water for municipal uses by CS-U (CS-U Pilot Project). This memorandum describes issues of concern to LAWMA that the State Engineer and the Colorado Water Conservation Board (CWCB) should consider and address in reviewing and acting on the Application.

In preparing this memorandum, we reviewed the following documents:

- HB 13-1248 City of Colorado Springs / Super Ditch (Fallowing-Leasing) Pilot Project Use of Catlin Canal Shares by City of Colorado Springs dated August 16, 2019 (Application);
- HB 13-1248 Colorado Springs Utilities Pilot Project Proposal for CWCB Selection dated November 16, 2018 (Proposal);
- Fallowing-Leasing Project Agreement by and Between the Lower Arkansas Valley Super Ditch Company and the City of Colorado Springs, Acting by and Through its Enterprise, Colorado Springs Utilities dated August 20, 2018 (Lease Agreement);
- HB 13-1248 Criteria and Guidelines for Fallowing-Leasing Pilot Projects, approved by the CWCB on November 19, 2013, and amended on January 25, 2016 (CWCB Guidelines);
- Decree entered in Case No. 10CW04;
- Decree entered in Case No. 12CW94;
- Diversion records, streamflow records, geographic information system (GIS) data and other technical reports that relate to typical reviews of engineering analyses; and
- Operating Procedures for Administration of Parcels Claimed for Augmentation Credit agreement between Kansas and Colorado dated September 2005.

On August 28, 2019 we requested additional information from the Applicants to assist in our review of the CS-U Pilot Project for LAWMA. The requested information included copies of the Catlin Canal share certificates listed in Table 2 of the Application, the signed agreements with the farmers listed in Table 2 of the Application, and the firm year yields of the CS-U replacement water supplies that would be used by Applicants for replacement of lagged return flow obligations. As of the date of this memorandum we have not received the information that we requested from the Applicants. We may supplement this memo after the Applicants provide the requested information to us.

In accordance with Section II.1 of the CWCB Guidelines, this memorandum provides comments on the Application in four sections: (I) CS-U Pilot Project background, (II) potential injury to LAWMA, (III) information the CWCB should consider and address during the review process for this pilot project; and (IV) terms and conditions needed to prevent injury.

The following are defined terms and abbreviations used throughout this memorandum:

- Consumptive Use (CU)
- Historical Consumptive Use (HCU)
- 635 Catlin Canal Company (CCC) shares (Subject Shares)
- Catlin Canal water rights associated with the Subject Shares (Subject Water Rights)
- The Amended Rules Governing the Diversion and Use of Tributary Ground Water in the Arkansas River Basin, Colorado (Amended Use Rules)
- Operating Procedures for Administration of Parcels Claimed for Augmentation Credits (Operating Procedures)
- Hydrologic-Institutional Model (H-I Model)
- Lease-Fallow Tool Spreadsheet (LFT)
- Return Flow Obligations (RFOs)
- State Engineer's Office (SEO)
- Division Engineer's Office (DEO)

I. CS-U Pilot Project Background

CS-U and Super Ditch have a lease agreement under which Super Ditch will deliver up to 1,000 acre-feet of fully consumable water to CS-U in Pueblo Reservoir in three out of the ten years between 2020 and 2029. The water delivered to CS-U will be obtained from the fallowing of a maximum, in any one year, of 635 Catlin Canal Company (CCC) shares and 622 acres historically irrigated with the Subject Shares. CS-U will determine the three out of ten years in which it will take delivery of the CU water (Delivery Years).

The Catlin Canal diverts from the Arkansas River approximately 61 miles downstream of Pueblo Reservoir. The following table summarizes the CCC's water rights:

Water Right	Priority No.	Appropriation Date	Adjudication Date	Administration Number	Amount (cfs)
Catlin Canal	2	04/10/1875	04/08/1905	9231.00000	22.0
Catlin Canal	5	12/03/1884	04/08/1905	12756.00000	226.0
Catlin Canal	7	11/14/1887	04/08/1905	13832.00000	97.0

The five participating farmers, as referenced in Table 2 of the Application, are Diamond A, Inc.; Herbert K. and Herbert D. Mameda; Russell Groves; and David, Lacie Dawn & Edward Mayhoffer (Participating Farmers). Diamond A., Inc. and Ken Schweizer also are participating farmers in the existing Catlin Pilot Project (CPP). The Participating Farmers' land, including the land to be fallowed under the CS-U Pilot Project, is described in Table 2 of the Application (Participating Farms).

The Participating Farmers have expressed interest in fallowing the portion of their land associated with the Subject Shares in the Delivery Years, during which the Participating Farmers would dedicate the Subject Shares for use in the CS-U Pilot Project. Table 4 of the Application identifies the total number of Pilot Project shares for each of the Participating Farms and the percentage of that farm's shares to be fallowed in Delivery Years. In those years, CU water attributable to the Subject Shares would be delivered to the Catlin Canal headgate and measured through the ditch flume, and then returned to the Arkansas River via augmentation stations on Timpas Creek or Crooked Arroyo. The augmentation station deliveries include a CU water component and a return flow water component.

The return flow water component of the augmentation station deliveries includes a tailwater component and a deep percolation component. All of the tailwater component is owed to the river at the time it is delivered to the river after being measured through an augmentation station. The deep percolation component is also owed to the river to the extent necessary to replace the lagged deep percolation return flows for the Subject Shares. At times the deep percolation component delivered to the river may exceed the Applicants' lagged deep percolation return flow obligations ("Excess DP Water"). At such times, the Applicants propose to exchange the Excess DP Water to Pueblo Reservoir for later release for replacement of the lagged deep percolation return flows or for delivery to CS-U for municipal use. Any municipal use of Excess DP Water by CS-U will require the Applicants to have other water available to replace the return flow obligations that would have been replaced by the Excess DP Water.

The Applicants have also identified the possibility of using step exchanges that would exchange or deliver the water to other intervening storage structures in the event that a direct exchange to Pueblo Reservoir is not possible. If the water is exchanged using the step exchange approach, the Applicants would utilize the exchanges decreed in Case No. 10CW04 or an administrative exchange with the water eventually being delivered to Pueblo Reservoir.

The Applicants have proposed the following options to replace the lagged deep percolation return flows in the non-irrigation season (Lagged Winter Return Flows): 1) Colorado Springs will replace the Lagged Winter Return Flows with supplies owned or controlled by Colorado Springs, 2)

the Applicants will release CU water from storage, or 3) the Applicants will book over the non-irrigation season return flows to the Winter Water Program in Pueblo Reservoir.

II. Potential Injury to LAWMA

1. LAWMA Background

LAWMA owns numerous water rights on the Arkansas River, including water rights decreed to the Fort Lyon Canal, Keesee Ditch, Fort Bent Canal, Lamar Canal, Manvel Canal, X-Y Canal, Sisson Ditch, and Stubbs Ditch. LAWMA also owns water rights on the Purgatoire River in the Highland Canal. Those water rights are summarized in **Tables 1** and **2** attached to this memorandum, and the major components of those water rights are shown in attached **Figure 1**. **Table 1** includes LAWMA's Purgatoire River rights because the Highland Canal's third water right may be called out by District 67 ditches. If the Applicants don't properly replace historical return flows associated with the Subject Water Rights, this water right will be called out more often by District 67 ditches in the future and therefore is susceptible to injury from the temporary change of water rights proposed in this pilot project. All of LAWMA's water rights were changed in Case Nos. 02CW181, 05CW52, 10CW85, and 15CW3067 or are included in pending change Case No. 17CW3068 or Case No. 19CW3036, to allow for augmentation and replacement uses by LAWMA. Finally, LAWMA also has interests in water that is derived from John Martin Reservoir's Conservation Pool.

LAWMA uses its changed water rights as a source of augmentation supply within the augmentation plan originally decreed in Case No. 02CW181 (LAWMA Augmentation Plan), annual administratively approved replacement plans under Rule 14 of the Amended Use Rules (Rule 14 Plan), annual administratively approved irrigation improvement plans under Rule 10 of the Compact Rules Governing Improvements to Surface Water Irrigation Systems in the Arkansas River Basin in Colorado (Rule 10 Plan), and administratively approved substitute water supply plans on behalf of LAWMA's members. The LAWMA Augmentation Plan and Rule 14 Plan provide for replacement of out-of-priority stream depletions attributable to approximately 645 structures (490 structures in the Rule 14 Plan and 155 structures in the Augmentation Plan) located within the Arkansas River basin. LAWMA has members along the mainstem and tributaries of the Arkansas River between La Junta and the Kansas-Colorado Stateline.

2. Potential Injury to LAWMA from the CS-U Pilot Project

The Arkansas River is an over-appropriated system. That is, for a majority of the time, all physically available water has been either appropriated by senior water rights or is not available for appropriation due to the State of Colorado's delivery obligation to the State of Kansas under the Arkansas River Compact (Compact) signed in 1949. In other words, the demands for surface water by existing senior surface water rights exceed the available supply except during extremely rare flood events marked by John Martin Reservoir spilling.

LAWMA's mainstem Arkansas River water rights divert water downstream of both the Catlin Canal headgate and the locations on the Arkansas River where return flows accrued from use of the Subject Shares on the Participating Farms. Therefore, unless adequate protective terms and conditions are included in any approval of this pilot project, the requested temporary change of water rights has the potential to directly injure LAWMA's water rights that divert from the Arkansas River and augmentation and replacement plan operations by reducing the supply of water that is available for diversion by LAWMA's senior water rights or by increasing LAWMA's augmentation obligations to Colorado water rights or to the Colorado-Kansas Stateline under the Compact. In addition, LAWMA's Highland Canal water rights on the Purgatoire River could be injured due to a rebound call from a senior water right in District 67 as described in Section II.1. above. The proper quantification of the consumptive use and return flow obligations attributable to the Subject Water Rights and the replacement of those return flow obligations in amount, time and location are essential to prevent injury to LAWMA's water rights, LAWMA's interest in John Martin Reservoir's Conservation Pool, and other Arkansas River and Purgatoire River water rights, as well as to maintain the State of Colorado's compliance with the Arkansas River Compact.

III. Information the CWCB and SEO Should Consider

The following are issues of concern to LAWMA that the State Engineer and the CWCB should consider and address during their review of and action on the Application for the CS-U Pilot Project:

1. Evidence of Necessary Agreements

In Section IV of their Proposal dated November 16, 2018, the Applicants described a number of agreements that they believe to be "necessary for operation of the CS-U Pilot Project" (Necessary Agreements) and indicated that they believe "that all of the agreements and approvals that may be necessary to operate the CS-U Pilot Project can be reasonably obtained." Those Necessary Agreements were as follows: (a) lease agreement or other appropriate agreement between the Super Ditch and CS-U; (b) lease agreements or other appropriate agreements between the Super Ditch and the CCC; (c) lease agreements or other appropriate agreements between CCC and each of the Participating Farmers; (d) CCC approval of Applicants' use of Catlin Canal facilities and Applicants' carriage of non-Catlin water to recharge facilities; (e) agreements for lease of recharge sites; (f) Bureau of Reclamation (BoR) annual renewal of Lower Arkansas Valley Water Conservancy District's (Lower Ark) "if and when" storage account, and (g) agreements with appropriate entities for Applicants' use of any structures needed for the stepped exchanges.

The Proposal attached copies of the following Necessary Agreements: Fallowing-Leasing Project Agreement between Super Ditch and CS-U dated August 20, 2018 (Super Ditch/CS-U Agreement); and the Schweizer and Maddux Recharge Site leases as extended to March 31, 2022. The Application attached copies of only the Super Ditch/CS-U Agreement and a letter agreement dated August 16, 2019, between Super Ditch and CS-U for CS-U's replacement of return flows associated with the CS-U Pilot Project. The Application did not include copies of a lease agreement or other appropriate agreement between the Super Ditch and the CCC; lease

agreements between the Participating Farmers and the CCC; CCC's approval (through easement agreements and carriage agreements, as applicable) allowing Applicants' use of Catlin Canal facilities and Applicants' carriage of non-Catlin water to recharge facilities; BoR's annual renewal of Lower Ark's if-and-when storage account Pueblo Reservoir; or agreements with appropriate entities for Applicants' use of facilities that would be used within the proposed stepped exchanges under the decree in Case No. 10CW04.

All Necessary Agreements should be in place, with copies delivered to all commenting parties, before the State Engineer and the CWCB begin their review of the Application, as follows:

(a) Lease agreements or other appropriate agreements between Super Ditch and the CCC. The Proposal attached the CCC's resolution indicating CCC's intent to participate in the Pilot Project; however, the Applicants have not yet provided a copy of a lease agreement or other appropriate agreement between Super Ditch and the CCC. The Application therefore is incomplete.

(b) Lease agreements or other appropriate agreements between either Super Ditch or CCC and the Participating Farmers.

  i. Letters of interest. The Proposal attached letters of interest from the Participating Farmers, but neither the Proposal nor the Application attached the Necessary Agreements between either (as applicable under the particular circumstances of the CS-U Pilot Project) the CCC and the Participating Farmers or the Applicants and the Participating Farmers. Therefore, the Application is incomplete.

  ii. Agreements with Participating Farmers. The Applicants have not yet provided copies of the required agreements between either Applicants or CCC and the Participating Farmers. Therefore, the Application is incomplete.

(c) CCC's approval (through easement agreements and carriage agreements, as applicable) allowing Applicants' use of Catlin Canal facilities and Applicants' carriage of non-Catlin water to recharge facilities. In the absence of the Necessary Agreements providing for Applicants' use of CCC facilities and carriage of non-Catlin water to recharge facilities, the Application is incomplete. The Applicants provided a Catlin Carriage Agreement Extension that expires on November 15, 2019 and doesn't cover the operations under this Application.

(d) BoR's annual renewal of Lower Ark's "if and when" storage account. In the absence of the Necessary Agreement documenting BoR's renewal of Lower Ark's if-and-when storage account in an appropriate volume, the Application is incomplete.

(e) Additional Necessary Agreements. The Applicants have not yet provided evidence of agreements with the Colorado Canal Company, the Holbrook Mutual Irrigating Company, or other appropriate entities for the use of their facilities in any stepped exchanges. Therefore, the use of these facilities as part

of stepped exchanges within the CS-U Pilot Project should not be considered in the review process of the Application and should not be part of any approval.

In light of the above-described omissions from the Application, the beginning of the statutory period for comment on the Application should be triggered only when Applicants have circulated copies of each of the Necessary Agreements described above. Furthermore, in the absence of the omitted Necessary Agreements, the State Engineer cannot make the no-injury finding required by Section 37-60-115(8)(f), C.R.S., and by the CWCB Guidelines. Therefore, the State Engineer and the CWCB should do one of the following: (i) make no review of and take no action on the Application unless and until the Applicants provide evidence of each of the Necessary Agreements described above; (ii) review the Application based on the assumption that any Necessary Agreements not already provided will not be in place for operation of the CS-U Pilot Project, and therefore deny the Application in whole or in part because the State Engineer cannot make a determination that the project can operate without causing injury; or (iii) only approve the Application contingent upon the Applicants' serving satisfactory evidence of the Necessary Agreements upon the State Engineer, the CWCB, and the parties by a date certain before operation of the CS-U Pilot Project would begin, with an opportunity for comment by the parties and a response from the State Engineer and the CWCB with respect to such evidence.

2. Historical Consumptive Use Analysis

a. Study Period

The Applicants used the same study period of 1988 to 2017 for all five Participating Farms. This study period is appropriate for the Schweizer and Mayhoffer farms, because neither of those farms previously has been dried up for augmentation credit. However, the 1988 to 2017 study period should not be used for the remaining three Participating Farms, because each was previously dried up, in part, for augmentation credit during portions of that study period. Section II.G.2.a.ii of the CWCB Guidelines states that a historical use and historical consumptive use analysis of the farms should be based on at least 30 years of diversion records. We assume that this is intended to mean at least 30 years of diversions delivered to the Participating Farms for the decreed irrigation use. The Applicants' analysis erroneously assumes that the farms other than the Schweizer and Mayhoffer farms were irrigated throughout the 1988 to 2017 study period when in fact they were not. Therefore, the Applicants' historical consumptive use analysis for those farms is flawed and results in overstating the historical consumptive use for the farms that were not irrigated throughout the 1988 to 2017 study period.

Attached **Table 3** summarizes, for each of the Participating Farms, the number of acres previously dried up for augmentation credits in a Rule 14 plan Attached **Table 4** shows those parcels identified by the DEO as having been previously dried up within a Rule 14 plan, with comments for each parcel. Attached **Figure 2** shows those parcels that both have been previously dried up within a Rule 14 plan and are part of the Participating Farms.

To ensure that the HCU analysis accurately determines the CU attributable to historical use of the Subject Shares, the study period for each Participating Farm for which dry-up previously has been claimed within a Rule 14 plan should run for the 30-year period that ends with the last year

before a portion of that farm was first claimed as dry-up within a Rule 14 plan. Based on this principle, Column 11 of **Table 3** shows the study period that we think the Applicants should use for each Participating Farm in the HCU analysis. This more refined analysis would prevent injury from Applicants' potentially claiming HCU for lands that previously were dried up or that used only groundwater for a source of irrigation. The Lease-Fallowing Tool (LFT) includes data back to 1950, which would allow for the adjustment of the study period on a farm by farm basis as proposed in attached **Table 3**.

The purpose of the Applicants' HCU analysis is to quantify the amount of HCU from the use of the Subject Shares on the Participating Farms. If the Applicants claim HCU for lands on which the Subject Shares were not used for irrigation for a portion of the study period, then there is the possibility of expanded use of the Subject Shares. This expanded use would injure downstream water rights, including LAWMA's.

b. Irrigated acres

i. Historical Dry-Up

The Applicants have conducted the analysis of historically irrigated acres as required by Section II.G of the CWCB Guidelines, by obtaining aerial photographs of the Participating Farms from each decade of the 1988 to 2017 study period. However, as stated above, there are periods when parcels on three of the five Participating Farms were claimed as dry-up in a Rule 14 plan or were identified by the DEO as irrigated by groundwater only. Therefore, the Applicants have not fully analyzed the three Participating Farms with prior Rule 14 plan dry-up for the entire 30-year period, as required in Section II.G.2.a.ii of the CWCB Guidelines. The Applicants should revise their HCU analysis accordingly.

ii. 1985 Irrigated Acres

In acting on the Application, the State Engineer must make a written determination as to whether the CS-U Pilot Project can operate without causing injury and without impairing compliance with any interstate compact. The CWCB Guidelines were developed for the entire State of Colorado, but because this project is within the Arkansas River Basin, special consideration must be given to the agreements reached by Kansas and Colorado in the Kansas v. Colorado litigation. Because the proposed CS-U Pilot Project will not involve a quantification of HCU and historically irrigated acres through the Division 2 Water Court, the maximum allowed acres in the HCU analysis should be the 1985 irrigated acres for each Participating Farm, as mapped by Colorado and agreed to by Kansas. This limitation would require the Applicants to meet the requirements for other administratively approved temporary changes of water rights under the Operating Procedures. See Section 1.B. of the Operating Procedures, which provides that "Plan proponents seeking to nominate any lands they believe were historically irrigated that do not lie within the mapped irrigated lands developed by the CDWR must seek a change of water right for the associated shares in Division 2 Water Court prior to approval in any plan approved pursuant to the Amended Use Rules." Because the Applicants are not seeking a change of water rights, the maximum historically irrigated acreage included in the HCU analysis should be the 1985

irrigated acreage mapped by the SEO as part of the Kansas v. Colorado litigation.[1] Attached **Table 3** identifies the 1985 irrigated acreage for each of the Participating Farms, from the GIS coverages obtained from the DEO.

iii. Overlap with Catlin Augmentation Association fallowing

Table 5 lists those parcels that are associated with the Catlin Augmentation Association (CAA) plan for augmentation approved in Case No. 12CW94. **Figure 3** shows the CAA parcels that are also part of the Participating Farms. Super Ditch and CAA must coordinate the fallowing of land on farms that overlap to prevent an expansion of use of CCC water rights as a result of CU credits' being claimed in both the CAA augmentation plan and the CS-U Pilot Project. A term and condition of the CPP in 2015 was that once the land was identified for use in the CPP, it became ineligible for use in the CAA augmentation plan. Additionally, paragraph 14.33 in the decree entered in Case No. 12CW94 states: "Land that is encumbered under a lease fallowing program, whether for continued irrigation or for dry-up, may not be claimed for dry-up purposes pursuant to this decree". Therefore, it is important that any approval of the CS-U Pilot project expressly identify those parcels on the Participating Farms that are also being fallowed under the 12CW94 decree, so that the DEO can properly enforce the terms and conditions of that decree.

c. Canal and Lateral Losses

The Applicants have used the LFT to determine the CU credits that are available on a monthly and annual time step to exchange to CS-U. In the LFT, the Applicants used the default values for canal and lateral losses from the H-I Model. The H-I Model has a canal loss of 10.4%, off-farm lateral loss of 3.5%, and on-farm lateral loss of 3.5%. However, Section II.G.2.ii.2 of the CWCB Guidelines specifies how ditch loss should be calculated in a fallowing-leasing pilot project: "ditch losses and off-farm lateral losses (use cited information from a previous change case or information from the relevant ditch company)". In the CAA's Case No. 12CW94, the most recent change case involving CCC shares, the canal loss cited in Paragraph 13.0 of the decree was 16.5%, with an additional lateral loss of 3.9% prior to delivery to the CAA farm units. Based on Section II.G.2.ii.2 of the CWCB Guidelines, the Applicants should revise the HCU analysis to reflect the cited information from the decree in Case No. 12CW94. By not incorporating the 12CW94 parameters for ditch loss and lateral loss, the current analysis over-estimates the CU credits available for exchange and under-estimates the return flows owed to the river.

[1] This is the standard to which operators of Rule 14 plans are held before they obtain change of water rights decrees for replacement supplies. The DEO allows for consumptive use credits on the dry-up of the 1985 irrigated acreage based on an engineering analysis using factors from the H-I Model until the Rule 14 plan operator has changed the surface water rights in water court. In a water court application, the applicant would identify the irrigated acreage over time, and that acreage may be different from the 1985 irrigated acreage. After a decree is entered changing the surface water rights, then the Rule 14 plan operator would be able to claim dry-up credit on acreage that is different from the 1985 irrigated acres if accepted by the water court.

d. Unit Response Functions

The Applicants developed unit response functions (URFs) from the centroids of the irrigated parcels for each farm. This approach is typically acceptable in determining the lag of groundwater return flows; however, the SEO and CWCB should take into consideration the following concerns with the Applicants' development of the URFs:

i. The Applicants should incorporate the URFs decreed in Case No. 12CW94 for those parcels that overlap with parcels identified in CAA's Case No. 12CW94. This would provide consistency when operations move from the CS-U Pilot Project back to operations under CAA's augmentation plan.

ii. The nearest point to the live stream on the Schweizer Farm is located in the middle of one of the proposed dry-up parcels. Based on the aerial photographs provided in the Applicants' Figure 9, the drain that is the nearest live stream actually begins on the east side of the county road and east of the dry-up parcel. The Applicants should revise their URF for the Schweizer Farm based on the proper location of the drain.

iii. The Applicants determined the distance from the centroid of the Mameda Farm to a spoil bank ditch. This distance should have been to the Arkansas River. Since the entire Mameda Farm is included in the CAA's Case No. 12CW94, the Applicants should use the URF developed in that case for this farm.

e. Source of Water to Replace Historical Return Flow Obligations

The Applicants have identified 8 different sources of water for replacement of RFOs, but the Applicants didn't identify the dry-year (firm) yield of the different sources in Table 9 of the Application, as required by the CWCB Guidelines (Section II.G.1.e). In fact, the Application states "many of these sources have a firm yield of zero," but the Applicants didn't identify which sources in Table 9 of the Application have no dry-year yields. Furthermore, the Applicants provided only average year yields to demonstrate that there are sufficient replacement sources for the RFOs. To document that they will be able to meet their RFOs in amount, time, and location and to comply with Section II.G.1.e of the CWCB Guidelines, the Applicants must provide the firm yield of the 8 different sources.

f. Operation of the CS-U Pilot Project

Based on an average-year HCU analysis, the Applicants have identified a total of 1,928.8 acre-feet of stream depletion credits for the 2020 plan year based on the total of 1,123.7 acre-feet of CU credits and 805.2 acre-feet of lagged deep percolation return flows. CS-U has a contract for 1,000 acre-feet of CU water from operation of the CS-U Pilot Project in 3 out of the next 10 years. In an average year, there are sufficient CU credits to meet the contractual obligation of 1,000 acre-feet of CU water. In dry years, the amount of CU credits (428.7 acre-feet) is insufficient to supply the 1,000 acre-feet of CU water to CS-U. It is unlikely CS-U would be requesting delivery of its requested water during a dry year due to the lack of exchange potential to deliver the CU water to

Pueblo Reservoir; instead, CS-U would more likely request water during average or wet years to replace water released from storage in its system during a dry year.

In any future operations the Applicants may exchange the CU credits from the augmentation stations on Timpas Creek and Crooked Arroyo to Pueblo Reservoir only if there is exchange potential as determined by the DEO. If there is no exchange potential to Pueblo Reservoir, then an exchange to intermediate reservoirs may occur only if the Applicants have obtained fully executed agreements to use those facilities and if there is exchange potential as determined by the DEO.

Any Excess DP Water may be exchanged to Pueblo Reservoir and stored in a separate Excess Capacity account designated for RFOs (RFO Account). This water may also be exchanged to intermediate reservoirs if the Applicants have obtained fully executed agreements for use of those facilities. To prevent injury to downstream water rights, including LAWMA's, CS-U should only be allowed to take delivery of Excess DP Water into its system when the return flow obligations associated with the Excess DP Water have been replaced by other CS-U fully consumable sources. In other words, CS-U should only be able to move Excess DP Water out of the RFO Account for municipal use in the amount CS-U delivers from its other supplies to meet the RFOs. As an example, if CS-U released 15 acre-feet from Lake Meredith to replace 13 acre-feet of return flow obligation (assuming 2 acre-feet of transit loss), then only 13 acre-feet of Excess DP Water may be moved out of the RFO Account in Pueblo Reservoir to CS-U for municipal use. Any remaining water in the RFO Account would remain for future release to the river as required.

Monthly evaporation from the RFO Account will be replaced monthly from the CU credits exchanged to Pueblo Reservoir, which replacement is considered after the CU credits have been exchanged and counted against volumetric limits.

The Applicants' current proposal for replacing Lagged Winter Return Flows is to book over the required volumes of return flow replacement water in Pueblo Reservoir to the WWSP. This proposal will result in injury to LAWMA's water rights and storage water interests in John Martin Reservoir. The amount of water from the RFO Account that can be booked over to the Winter Water storage program must be calculated based on the return flows that would have accrued above the Fort Lyon river headgate. All return flows that would have accrued below the Fort Lyon river headgate must be delivered to the John Martin Reservoir Winter Conservation Account. In addition, based on the location of the farms, all return flows from the Mayhoffer Farm accrue below the Fort Lyon Canal river headgate and above the Las Animas Consolidated Canal (LACC) river headgate. Therefore, during the irrigation season, when the LACC is fully satisfied or not diverting, all of the Mayhoffer Farm return flows should be delivered to John Martin Reservoir or to the calling water right in District 67.

Fifty-five parcels identified by the Applicants can be irrigated by wells as shown on **Figure 4**. Based on the DEO's 2016 GIS coverage there are 20 total wells that can irrigate the 55 parcels. Of those 20 wells, 4 wells may be associated with the CAA augmentation plan and 16 wells are in Rule 14 plans. The use of the wells to irrigate dry-up lands under a Rule 14 plan should not be allowed

because that is an expansion of the pre-1986 use of the wells. Attached **Table 6** identifies those parcels within the CS-U Pilot Project that may be irrigated by wells. If any of these parcels are identified as the "fallowed" land in the CS-U Pilot Project, then the parcels may not be irrigated by the wells unless those wells and their depletions are augmented in a water court-approved augmentation plan or a substitute water supply plan that is associated with an application for approval of a augmentation plan pending in the water court.

The purpose of the CS-U Pilot Project is to "test the practice of fallowing irrigated agricultural land" and to evaluate whether the CU credits from that land may be purchased for municipal use (CS-U) as defined in Section I.A of the CWCB Guidelines. The word "fallow" means not tilled or planted. Since the very purpose of the lease-fallowing pilot project program is to fallow land, claim the CU credits from the fallowed land, and exchange those CU credits for temporary municipal use, dry-land farming the land instead of fallowing the land does not appear to use to be authorized by C.R.S. 37-60-115(8) ("Lease-Fallowing Statute") or the CWCB Guidelines.

If, despite the plain language of the Lease-Fallowing Statue and the CWCB Guidelines, the CWCB does allow dry-land farming and does not require fallowing of the dry-up land under the CS-U Pilot Project, then the dry-land farming should be subject to compliance with the following terms and conditions to prevent erosion and blowing soils and to control noxious weeds as required by C.R.S. 37-60-115(8)(d)(X):

1. Allowable dry-land farming practices include No-Till Dry-Land Farming and Minimum-Tillage Dry-Land Farming, as those terms are defined below.

    a. No-Till Dry-Land Farming means a system of planting seeds into untilled soil by opening a narrow slot, trench or band, of sufficient width and depth to obtain proper seed coverage. Because no soil tillage is utilized, a farmer must rely on herbicides to control the weeds. Both contact and residual herbicides may be used. Periodic fallowing and crop rotation may be used to stabilize the crop yields and allow the soil to rest.

    b. Minimum-Tillage Dry-Land Farming means management of farming operations which seeks to minimize impacts from tilling through the use of a sweep plow, strip-till, or similar technology. Additionally, a farmer may rely on herbicides to control weeds. Both contact and residual herbicides may be used. Periodic fallowing and crop rotation may be used to stabilize the crop yields and allow the soil to rest.

2. Weeds shall be adequately controlled on any dry-land farmed parcel.

3. The dry-up parcel will be planted and farmed without irrigation water, such that it is dependent solely upon precipitation to meet crop water requirements; if other dry-land farming in the region is producing crops, the farm also is producing a dry-land crop with weeds adequately controlled and with soil erosion from wind controlled in a manner consistent with state and local law; and minimum crop residue after harvest of the dry-land crop is as described below, and the crop residue is left on the Dry-Up Parcel until the Dry-Up Parcel is prepared for the next rotation of planting; provided, however, that this requirement for crop residue does not prevent a farmer from controlling weeds by mechanical tillage of the Dry-Up Parcel or using other acceptable methods of weed control that do not disturb the residue on the surface. For grain crops, such as winter wheat or milo, minimum crop residue must be at least thirty percent (30%), determined by the step-point method. For hay or forage crops, crop stubble must measure at least five inches, with row spacing no more than thirty inches.

4. For each dry-up parcel that was dry-land farmed during the preceding year, Applicants shall submit a report that documents the efforts undertaken in the preceding year to dry-land farm the parcel, including information about tilling practices, the planting and fallowing rotation, the crops planted, and the acres fallowed; information about herbicides or pesticides applied; information about efforts to control erosion of the soil caused by wind; information about the amount of crops harvested or the number of animal units grazing the land; and information about the amount of crops planted and harvested by other dry-land farmers in the area during the preceding year; if the crop is a grain crop, the percentage crop residue determined using the step-point method, and if the crop is a hay/forage crop, the stubble height in inches and the row spacing in inches.

The above-stated dry-land farming requirements are consistent with the requirements included in LAWMA's change of water rights decree entered in Case No. 15CW3067 on February 25, 2019 at the insistence of the Lower Arkansas Valley Water Conservancy District.

In addition, if dry-land farming is allowed then the following protocols should be included as terms and conditions on such operations in order to prevent injury to LAWMA's water rights that would result from the depletion and subsequent refilling of the soil moisture reservoir after a parcel has been dry-land farmed and then returned to irrigation by the Subject Shares:

1. The Applicants must use the LFT with date from the previous year's irrigation season to determine and report the total amount of soil moisture available to the dry-land crops **before** the parcel(s) is used for dry-land farming. That amount of soil moisture will be the baseline amount that will be used to determine the amount of additional irrigation water that will be delivered to the parcel(s) to replace the depleted soil moisture reservoir when the dry-land farmed parcel is put back into irrigation.

2. The Applicants must provide a report after harvest of the dry-land crop that determines the amount of the soil moisture that was depleted from the baseline condition during the season, taking into account effective precipitation from the closest weather station. Effective precipitation will be calculated in the same manner as in the H-I Model.

3. Upon continued irrigation of the parcel(s) that were dry-land farmed, an amount of water that is equal to the difference between the baseline soil moisture determined before dry-land farming and the soil moisture determined after dry-land farming must be delivered by Applicants to the Arkansas River at the Timpas Creek confluence during the month of April as an additional return flow obligation in order to prevent injury to other water rights.

g. Volumetric Limits

The volumetric limits in the Applicants' Proposed Term and Condition No. 6 are overstated as a result of the improper HCU analysis, as described above, and because they include the CU credit for the entirety of the Participating Farms. Table 4 to the Application shows, for each Participating Farm, the total number of shares that can be included in the CS-U Pilot Project and the percentage of those total shares that will be fallowed to meet the contractual obligation to deliver 1,000 acre-feet of CU credits to CS-U in Delivery Years. The percentage of total shares that will be fallowed should be factored into the Applicants' calculation of the volumetric limit for each Participating Farm. In preparing this memorandum, we have re-run the HCU analysis for the Participating Farms using the LFT with the modifications described above for the period of study, canal loss, and off-farm lateral losses. Attached **Tables 7** through **11** summarize the results of that revised analysis. **Table 12** lists our recommended revised volumetric limits that incorporate the changes to the HCU analysis and limit the monthly and annual volumetric limits to the farm-specific percentages identified in Table 4 of the Application.

h. Accounting

The Applicants provided sample daily and monthly accounting as required by Appendix C to the CWCB Guidelines; however, the draft accounting dated August 15, 2019 was missing data required by Appendix C. Additional accounting summarizing all of the Participating Farms and exchanges proposed for inclusion in the CS-U Pilot Project should be included to provide an overall summary of Applicants' proposed operations on a monthly basis. As part of the sample accounting required by Appendix C to the CWCB Guidelines, this summary accounting should be made available for the State Engineer, the CWCB, and the parties.

The Applicants have generally met the requirements for the accounting provided, but we note that a formula in the Lagged RFO Repl worksheet for Column M entitled "Total Depletions at Fort Lyon Canal" includes lagged groundwater return flows from the Mayhoffer Farm. The Mayhoffer

Farm is located below the Fort Lyon Canal river headgate; therefore, there is no depletion to the Fort Lyon Canal as a result of the lagged Mayhoffer groundwater return flows. This formula should be fixed, or the Applicants should provide an explanation of how the lagged groundwater return flows are owed to the Fort Lyon Canal.

IV. Proposed Terms and Conditions

LAWMA supports approval of the CS-U Pilot Project if that approval contains the terms and conditions necessary to ensure that Applicants' operations comply with the statute and the CWCB Guidelines and do not cause injury to other water rights, including LAWMA's. In the sections below, we have reproduced Applicants' proposed terms and conditions in italics, underlined LAWMA's requested additions to those terms and conditions, and shown in strikethrough LAWMA's requested removal of language from those terms and conditions. Our additional comments and explanations are shown in regular font.

Proposed term/condition: *4. The following monthly factors will be used to calculate monthly composite consumptive use factors, which will be applied to augmentation station deliveries to determine monthly consumptive use. The monthly composite consumptive use factors will be calculated as the sum of monthly consumptive use for each farm multiplied by the fallowed shares for each farm, divided by the total number of fallowed shares. The calculation of monthly composite consumptive use factors will be performed for each month from March through November.*

Consumptive Use Factors

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
Diamond A	-	-	*0.188*	*0.234*	*0.384*	*0.492*	*0.487*	*0.472*	*0.428*	*0.167*	*0.166*	-
Schweizer	-	-	*0.301*	*0.299*	*0.456*	*0.539*	*0.547*	*0.548*	*0.536*	*0.412*	*0.327*	-
Mameda	-	-	*0.550*	*0.489*	*0.516*	*0.550*	*0.550*	*0.550*	*0.550*	*0.550*	*0.550*	-
Groves	-	-	*0.430*	*0.389*	*0.489*	*0.548*	*0.550*	*0.550*	*0.550*	*0.508*	*0.490*	-
Mayhoffer	-	-	*0.227*	*0.263*	*0.422*	*0.522*	*0.527*	*0.527*	*0.482*	*0.247*	*0.281*	-

Comments/explanation: The monthly consumptive use factors shown in the table above will need to be changed after Applicants have revised the HCU analysis to use the proper study period, canal loss, and off-farm lateral loss. We believe the following are the correct factors:

Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Diamond A	-	-	0.225	0.260	0.374	0.512	0.514	0.511	0.440	0.186	0.200	-
Schweizer	-	-	0.343	0.333	0.469	0.546	0.550	0.550	0.550	0.484	0.425	-
Mameda	-	-	0.550	0.533	0.529	0.550	0.550	0.550	0.550	0.550	0.550	-
Groves	-	-	0.477	0.427	0.510	0.550	0.550	0.550	0.550	0.542	0.501	-
Mayhoffer	-	-	0.269	0.279	0.441	0.531	0.542	0.540	0.510	0.329	0.309	-

Proposed term/condition: *5. The portion of available pilot project augmentation station headgate delivery that is not credited as consumptive use will first be allocated to irrigation season tailwater and irrigation season lagged deep percolation return flow maintenance for that month. The remaining available pilot project augmentation station headgate delivery will be available for exchange to Pueblo Reservoir with the consumptive use portion separated from the amount owed for replacement of future lagged deep percolation return flows ("DP Water"). Only the consumptive use portion exchanged may be available for all approved uses by the City of Colorado Springs. The City of Colorado Springs may utilize the DP Water only after the City of Colorado Springs has delivered the same amount of water from its sources to replace the lagged deep percolation return flows associated with the DP Water. The available pilot project augmentation station headgate delivery will be calculated as the farm headgate delivery minus lateral loss of 3.9% and consumptive use. Consumptive use is calculated as the available pilot project augmentation station headgate delivery multiplied by the composite consumptive use factor. Return flows are equal to the available pilot project augmentation station headgate delivery minus the consumptive use. Tailwater return flow is the return flow multiplied by 20%, and deep percolation return flow is the return flow multiplied by 80%.*

> **Comments/explanation:** The ability of CS-U to use, in its municipal system, water delivered through the augmentation stations and not credited as CU credits (i.e., the DP Water) should be subject to CS-U's delivering and maintaining the lagged deep percolation return flow component. At no time should CS-U be able to use, directly or by exchange, any water from the tailwater return flow component.

Proposed term/condition: *6. The monthly and annual consumptive use will be limited by the following maximum values which are the averages of the three greatest months for each month and three greatest years of the study period, consistent with the Criteria and Guidelines. The values in the table will be multiplied by the ratio of the number of shares fallowed for each farm divided by the total number of shares included in the Pilot Project for each farm, (not including shares leased from the Colorado Division of Parks and Wildlife (CPW) since the consumptive use for CPW shares is not included in the below table). In addition, the Pilot Project will deliver no more than 1,000 acre-feet of consumptive use credits to Colorado Springs Utilities under the CS-U Pilot Project in any given year (Contract Limitation). Once any of the monthly volumetric limits, annual volumetric limits or the Contract Limitation has been met, all water available to the Subject Shares will be delivered through the augmentation stations on the Catlin Canal with no further claim of consumptive use credits or any other use until such time as use of the Subject Shares by Applicants is again allowed in accordance with the volumetric limits and Contract Limitation.*

Monthly and Annual Maximum Consumptive Use Credits

(All Values in Acre-Feet)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Diamond A	0.0	0.0	108.8	261.2	401.9	495.5	485.5	456.9	323.6	270.8	143.5	0.0	2278.0
Schweizer	0.0	0.0	33.3	58.1	77.2	93.1	96.5	90.9	68.2	58.1	32.0	0.0	481.7

Mameda	*0.0*	*0.0*	*29.5*	*43.9*	*41.0*	*47.7*	*48.9*	*46.0*	*36.2*	*32.2*	*16.2*	*0.0*	*300.2*
Groves	*0.0*	*0.0*	*34.1*	*61.5*	*62.8*	*75.2*	*77.2*	*72.6*	*57.1*	*49.2*	*25.6*	*0.0*	*426.9*
Mayhoffer	*0.0*	*0.0*	*4.3*	*9.2*	*13.7*	*16.5*	*16.5*	*15.6*	*11.0*	*10.1*	*5.7*	*0.0*	*79.6*

Comments/explanation: The monthly and annual maximum CU credits should be revised to reflect the proper study period for each farm, as well as the canal and off-farm lateral losses determined in Case No. 12CW94 and the percentage of shares allocated for fallowing on each of the Participating Farms. Our calculation of the corrected monthly and annual volumetric limits is included in the table below.

The Contract Limitation is needed because CS-U has a contract for only 1,000 acre-feet of consumable water. The Contract Limitation would apply to the annual volume of CU credits exchanged into Pueblo Reservoir or any other reservoir in a step exchange scenario. Once that limit is met, then all deliveries to the Subject Shares should be delivered to the river to meet return flow obligations, with no claim of CU credits.

Farm	% of Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Diamond A	41.40%	0.0	0.0	58.4	93.3	128.8	189.9	192.8	196.2	125.9	88.1	61.6	0.0	816.0
Schweizer	15.35%	0.0	0.0	5.3	9.9	11.0	13.4	13.7	12.9	10.1	8.4	4.5	0.0	71.5
Mameda	60.61%	0.0	0.0	17.6	24.2	23.3	26.7	27.9	27.4	19.7	16.6	8.2	0.0	169.1
Groves	38.41%	0.0	0.0	14.3	22.0	23.3	26.7	27.9	27.4	19.7	16.6	8.3	0.0	157.2
Mayhoffer	100.00%	0.0	0.0	5.0	9.0	12.8	15.4	16.0	15.1	10.5	9.3	5.3	0.0	77.3

Proposed term/condition: *7. Deep percolation return flows for the Diamond A, Schweizer, Mameda, Groves, and Mayhoffer Farms will be lagged using the URFs attached in Appendix G, subject to revisions to the URFs as ordered by the Division Engineer's Office. Return flows will be maintained via release of supplies available to Colorado Springs listed in Table 9 or other fully consumable sources available to Colorado Springs for replacement of return flows. Transit losses will be assessed from the point of release to the confluence of the Arkansas River and/or Crooked Arroyo based on the augmentation station(s) in use for the Pilot Project.*

Comments/explanation: As explained above, the URFs should be revised to reflect the URFs in Case No. 12CW94 and to correct the distances to live streams shown in the appendices to the Application.

Proposed term/condition: *8. Fallowed parcels must be at least ten acres in size unless they comprise all of an existing CDSS parcel that is already less than ten acres. Parcels that represent a portion of an existing field can only be split in the same direction of historic irrigation unless a means of physical separation is approved by the CWCB based on the written determination of the State Engineer. A physical separation must exist between any irrigated portion of a parcel and the dry-up portion. For dry-up fields left fallow ~~or with a dry-land cover crop without permanent root system (that is, not alfalfa or pasture grass for example)~~, the separation can be a ditch or tilled strip at least ten feet in width that prevents irrigation application from reaching the dry-up parcel. For partial fields*

containing deep-rooted crops such as alfalfa or pasture grass, a deep tilled separation of at least 25 feet must be maintained along with any ditches necessary to ensure no irrigation application to the dry-up portion. ~~For any dry-up parcel that is planted with a dry-land crop (haygrazer, milo, millet, etc.), the crop should either be drilled at an angle to normal irrigation direction or a tilled strip maintained at the top of the field that clearly separates the crop from any possible irrigation source or both.~~

Comments/explanation: There should be no planting of a dry-land crop on those parcels identified as fallowed during the operation of the CS-U Pilot Project. As stated above, the definition of fallow is to not till or plant a parcel. If this project is to demonstrate that a fallowing-leasing program is a suitable alternative to permanent dry-up of irrigated land, then the program should determine if the land can be productive again after it has been fallowed for a year or more. The Participating Farms should plan accordingly to maintain a non-producing cover crop to prevent soil erosion. If dry-land farming is allowed, then the terms and conditions in Section 2.f, above should be included as terms and conditions on any such dry-land farming.

Proposed term/condition: *9. Dry-up of the fallowed fields will comply with the "Operating Procedures for Administration of Parcels Claimed for Augmentation Credits" of the Colorado State Engineer's Office. Re-irrigation of dry-up parcels with any source of water, including groundwater, shall not be allowed during the year in which such parcel is fallowed in pilot project operations.*

Comments/explanation: The proposed term and condition should include the additional language to clarify that the dry-up parcels may not be irrigated by any source of water. There are several parcels in the CS-U Pilot Project that can receive water from wells. In fact, some of the parcels identified appear to have been irrigated solely by wells. There is nothing currently in the Applicants' proposed term and condition that prevents the dry-up parcels on the Participating Farms from being irrigated with groundwater.

Proposed term/condition: *16. Any exchange of water as a part of this Pilot Project ~~not operated pursuant to a court decree~~ must be approved in advance by the Division Engineer after a determination that there is sufficient exchange potential to accomplish the requested exchange without injury to other water rights.*

Comments/explanation: All exchanges must be approved in advanced by the DEO regardless if they are operated under a court decree or not. The DEO will then determine if the exchange is operated under an exchange priority, or under an administrative exchange.

Proposed term/condition: *29. To the extent that the Colorado Springs/Super Ditch Pilot Project stores the net depletion amount of the participating shares in Pueblo Reservoir, such water may be booked over to replace return flow obligations that are owed to Winter Water Storage Program participant structures during the Winter Water storage period on a monthly or weekly basis, or as otherwise required by the Division Engineer, as necessary to prevent injury to the water rights included in that Program. All other winter return flows that are owed below the Fort Lyon Canal*

headgate must be delivered to the confluence of the Arkansas River and Crooked Arroyo in time and amount.

Comments/explanation: The Applicants must replace all return flows that are owed below the Fort Lyon Canal river headgate in amount, time and location. Booking over all return flow obligations in the winter to the participants in the Winter Water Storage Program would include water owed below the Fort Lyon Canal river headgate. This results in an injury to water rights in District 67 and the participants in conservation storage in John Martin Reservoir.

Conclusion

It is our opinion that the State Engineer cannot make a written determination that the proposed CS-U Pilot Project can operate without injury unless and until the concerns summarized in this Memorandum have been addressed. If you have any questions relating to these concerns, please call me.

Adobe Creek Reservoir
Thurston Reservoir
Fort Lyon Canal
Fort Lyon Storage Canal
Arkansas River
Manvel Canal
X-Y Irrigating Ditch
Keesee Ditch
Lamar Canal
Fort Bent Ditch
Catlin Canal
John Martin Reservoir
Sisson & Stubbs Ditches
Highland Canal

Legend

- Catlin Canal
- Fort Bent Canal
- CS-U Pilot Parcels
- Fort Lyon Storage Canal
- Lamar Canal
- Adobe Creek Reservoir
- Fort Lyon Canal
- Manvel Canal
- John Martin Reservoir
- Highland Canal
- X-Y Irrigating Ditch
- Thurston Reservoir
- Keesee Ditch
- Sisson & Stubbs Ditches

0 3 6 12

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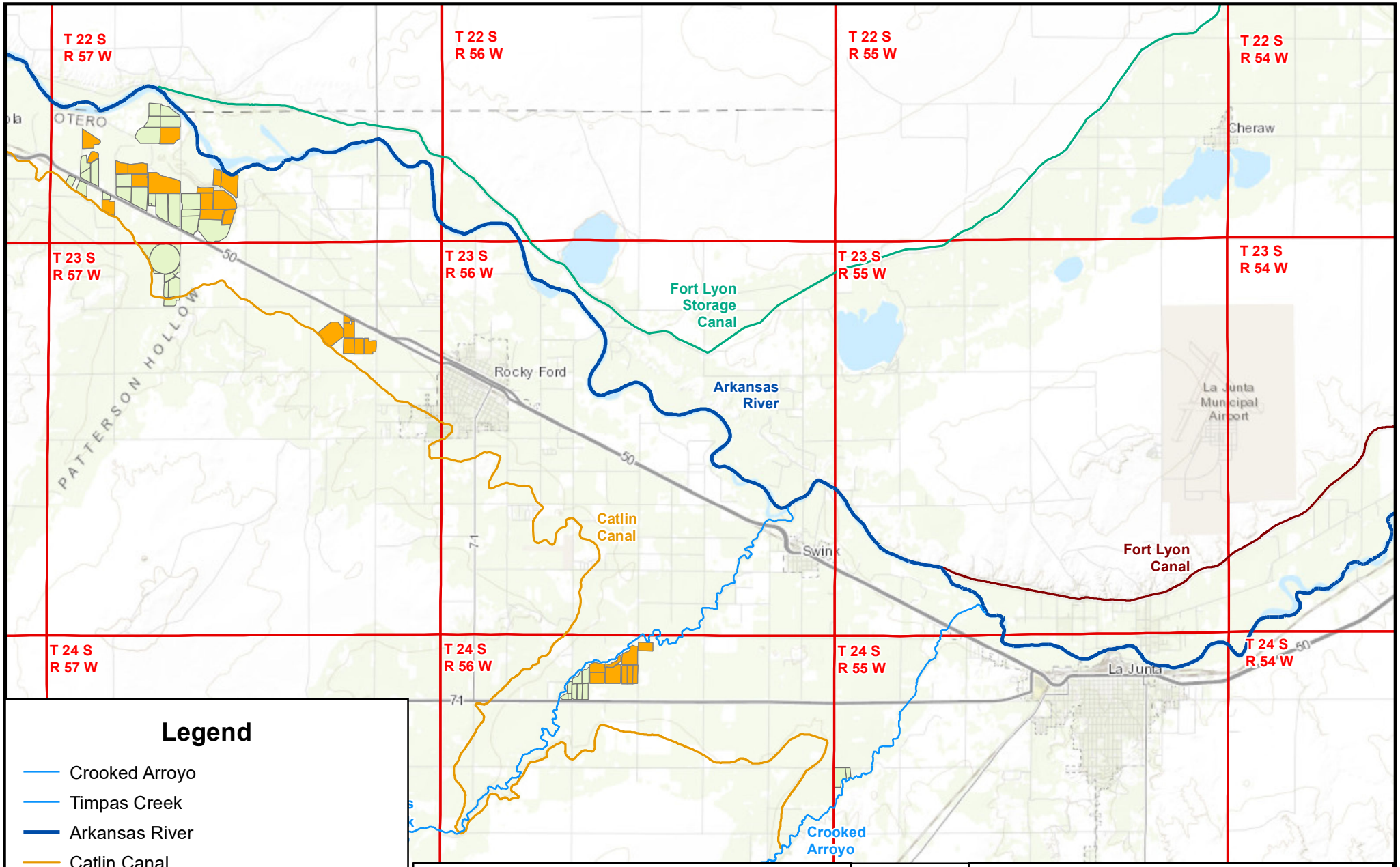
N W E S

Hendrix Wai Engineering, Inc.

Job No. L101
File: Figure 1.mxd
Date: 8/28/19\
Prepared For: LAWMA

Figure 1

General Location Map of LAWMA's Water Rights and Interests



Legend

- Crooked Arroyo
- Timpas Creek
- Arkansas River
- Catlin Canal
- Fort Lyon Storage Canal
- Fort Lyon Canal
- PLSSTownship
- CS-U Pilot Parcels With Rule 14 Dry-up
- CS-U Pilot Parcels

0 1 2 4

Miles

N W E S

Hendrix Wai Engineering, Inc.

Job No. L101

File: Figure 2.mxd

Date: 8/29/2019

Prepared For: LAWMA

Figure 2

General Location Map – Participating Farm Parcels Previously Dried up in a Rule 14 Plan

EXAMPLE MAP DRAFT

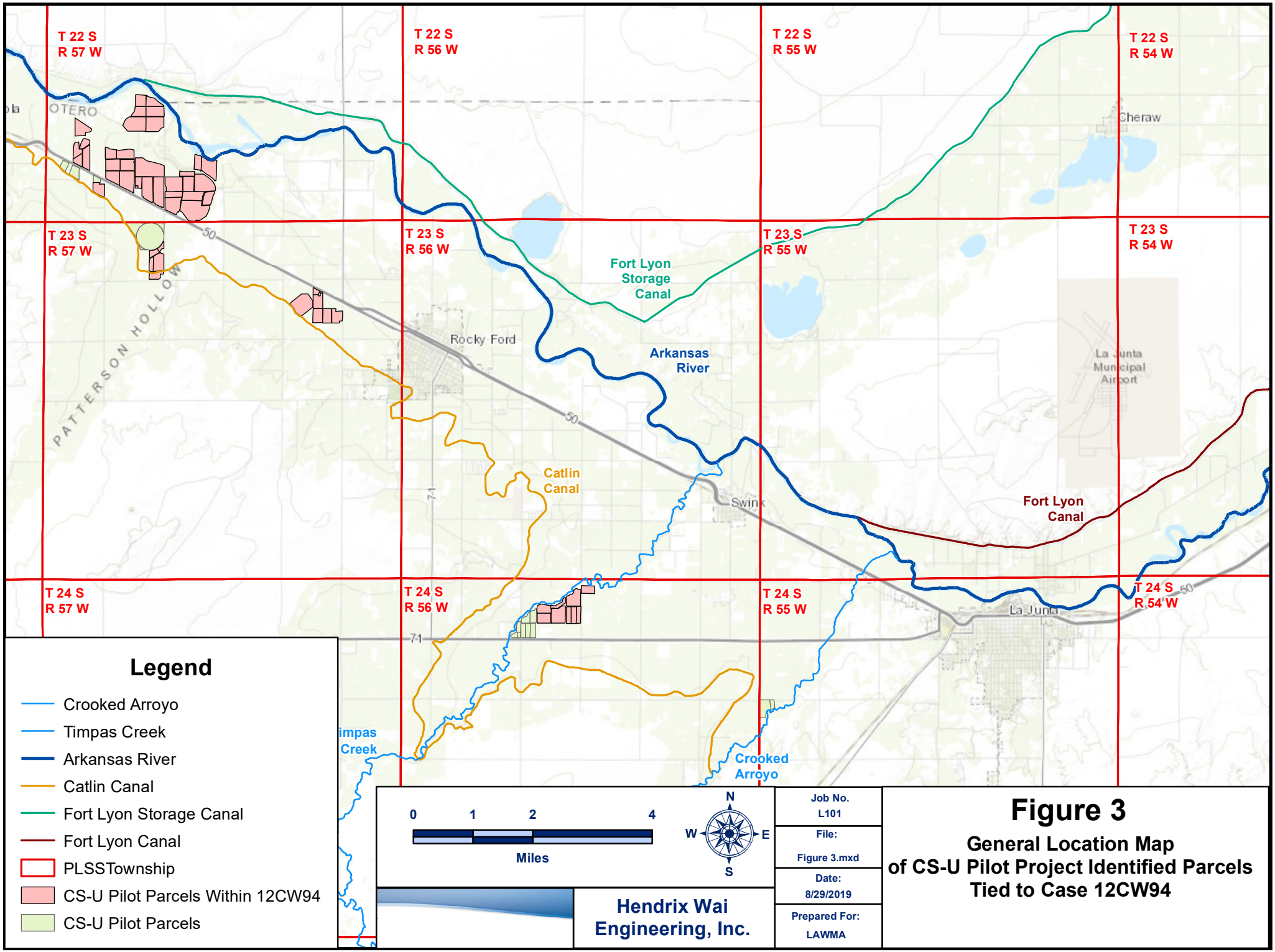


Figure 3

General Location Map of CS-U Pilot Project Identified Parcels Tied to Case 12CW94

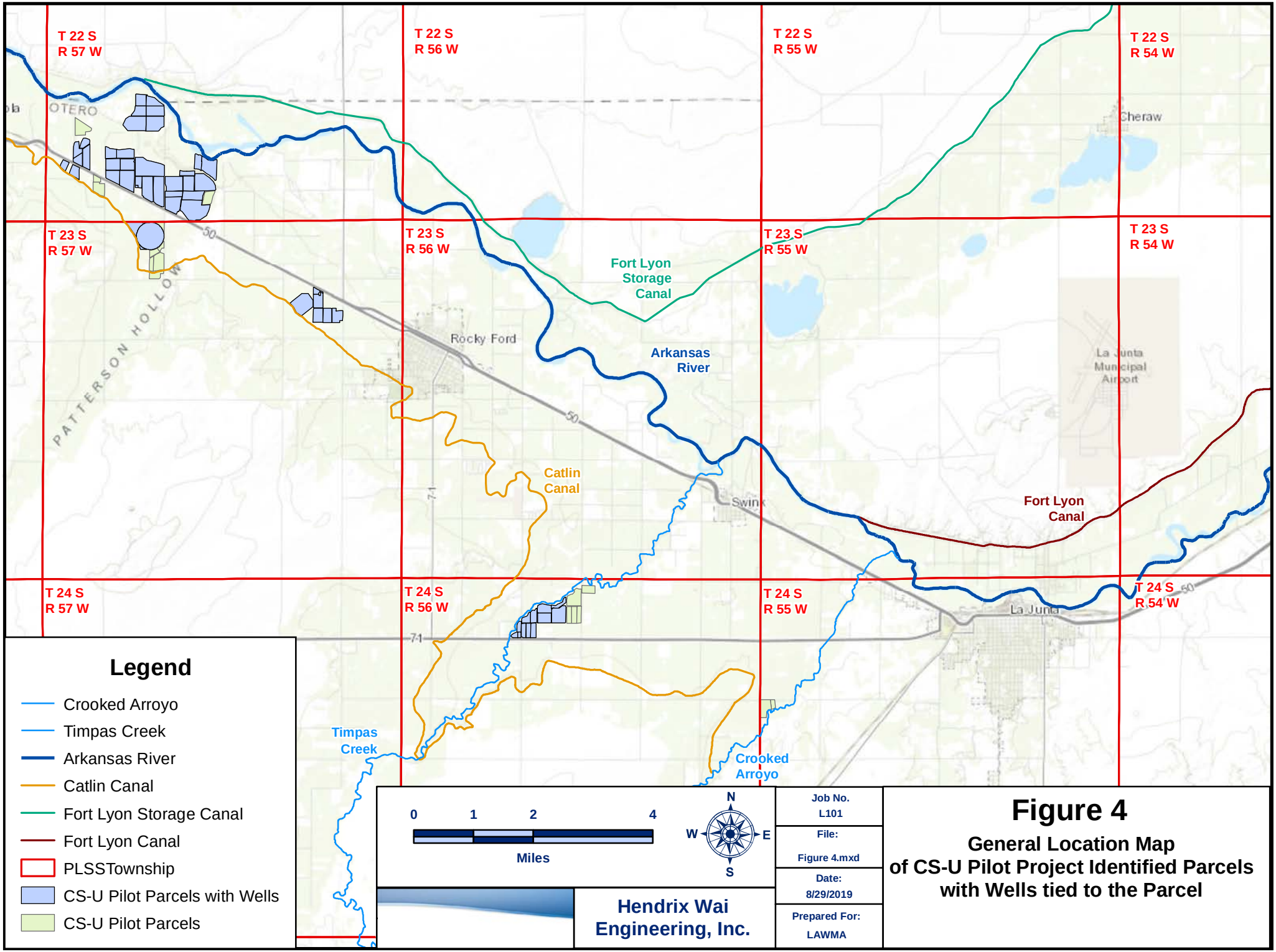


Figure 4

General Location Map of CS-U Pilot Project Identified Parcels with Wells tied to the Parcel

Table 1

Direct Flow Water Rights

Lower Arkansas Water Management Association

Replacement Source	Priority	Amount (cfs)	Original Case No.	Appropriation Date	Adjudication Date	Administration No.	LAWMA's Prorata Amount (cfs)	Case No.	Comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Highland Irrigation Company	27	16.60	November 11, 1910	May 31, 1866	August 10, 1903	5995.00000	14.86	02CW181	3,402 of 3,800 shares
Highland Irrigation Company	97	7.40	November 11, 1910	April 1, 1884	August 10, 1903	12510.00000	6.62	02CW181	3,402 of 3,800 shares
Highland Irrigation Company	120	38.50	August 30, 1922	March 1, 1909	August 30, 1922	21609.00000	34.47	02CW181	3,402 of 3,800 shares
Highland Irrigation Company	27	16.60	November 11, 1910	May 31, 1866	August 10, 1903	5995.00000	0.73	10CW085	167 of 3,800 shares
Highland Irrigation Company	97	7.40	November 11, 1910	April 1, 1884	August 10, 1903	12510.00000	0.33	10CW085	167 of 3,800 shares
Highland Irrigation Company	120	38.50	August 30, 1922	March 1, 1909	August 30, 1922	21609.00000	1.69	10CW085	167 of 3,800 shares
Total Highland Irrigation Company Direct Flow Rights		**62.50**					**58.70**		**3,569 of 3,800 shares**
Fort Lyon Canal Company	4	164.64	April 8, 1905	April 15, 1884	April 8, 1905	12524.00000	13.15	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	6	597.16	April 8, 1905	March 1, 1887	April 8, 1905	13574.00000	47.71	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	25	171.20	April 8, 1905	August 31, 1893	April 8, 1905	15949.00000	13.68	Pending 19CW3036	7,509 of 93,989.4166 shares
Total Fort Lyon Canal Company Direct Flow Rights		**933.00**					**74.54**		**7,509 of 93,989.4166 shares**
Keesee Ditch	1	9.00	July 1, 1895	March 13, 1871	July 1, 1895	7742.00000	4.50	02CW181	14.25 cfs of 28.5 cfs
Keesee Ditch	4	4.50	July 1, 1895	December 31, 1883	July 1, 1895	12418.00000	2.25	02CW181	14.25 cfs of 28.5 cfs
Keesee Ditch	1918-4	15.00	October 14, 1918	September 3, 1893	October 14, 1918	21857.15952	7.50	02CW181	14.25 cfs of 28.5 cfs
Keesee Ditch	1	9.00	July 1, 1895	March 13, 1871	July 1, 1895	7742.00000	4.50	05CW52	14.25 cfs of 28.5 cfs
Keesee Ditch	4	4.50	July 1, 1895	December 31, 1883	July 1, 1895	12418.00000	2.25	05CW52	14.25 cfs of 28.5 cfs
Keesee Ditch	1918-4	15.00	October 14, 1918	September 3, 1893	October 14, 1918	21857.15952	7.50	05CW52	14.25 cfs of 28.5 cfs
Total Keesee Ditch Direct Flow Rights		**28.50**					**28.50**		**28.5 cfs of 28.5 cfs**
Fort Bent Ditch Company	6	27.09	July 1, 1895	April 1, 1886	July 1, 1895	13240.00000	4.17	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	10	32.77	July 1, 1895	March 10, 1889	July 1, 1895	14314.00000	5.04	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	12	11.70	July 1, 1895	September 11,1889	July 1, 1895	14499.00000	1.80	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	14	26.77	July 1, 1895	August 12, 1890	July 1, 1895	14834.00000	4.12	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	1918-2	50.00	October 14, 1918	January 1, 1893	October 14, 1918	21857.15707	7.69	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	918-9	80.00	October 14, 1918	December 31, 1900	October 14, 1918	21857.18627	12.31	02CW181	1,793 of 11,651.2 shares
Fort Bent Ditch Company	6	27.09	July 1, 1895	April 1, 1886	July 1, 1895	13240.00000	0.33	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	10	32.77	July 1, 1895	March 10, 1889	July 1, 1895	14314.00000	0.41	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	12	11.70	July 1, 1895	September 11,1889	July 1, 1895	14499.00000	0.14	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	14	26.77	July 1, 1895	August 12, 1890	July 1, 1895	14834.00000	0.33	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	1918-2	50.00	October 14, 1918	January 1, 1893	October 14, 1918	21857.15707	0.62	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	918-9	80.00	October 14, 1918	December 31, 1900	October 14, 1918	21857.18627	0.99	10CW85	144 of 11,651.2 shares
Fort Bent Ditch Company	6	27.09	July 1, 1895	April 1, 1886	July 1, 1895	13240.00000	0.38	Pending 17CW3068	162.5 of 11,651.2 shares
Fort Bent Ditch Company	10	32.77	July 1, 1895	March 10, 1889	July 1, 1895	14314.00000	0.46	Pending 17CW3068	162.5 of 11,651.2 shares
Fort Bent Ditch Company	12	11.70	July 1, 1895	September 11,1889	July 1, 1895	14499.00000	0.16	Pending 17CW3068	162.5 of 11,651.2 shares
Fort Bent Ditch Company	14	26.77	July 1, 1895	August 12, 1890	July 1, 1895	14834.00000	0.37	Pending 17CW3068	162.5 of 11,651.2 shares
Fort Bent Ditch Company	1918-2	50.00	October 14, 1918	January 1, 1893	October 14, 1918	21857.15707	0.70	Pending 17CW3068	162.5 of 11,651.2 shares
Fort Bent Ditch Company	1918-9	80.00	October 14, 1918	December 31, 1900	October 14, 1918	21857.18627	1.12	Pending 17CW3068	162.5 of 11,651.2 shares
Total Fort Bent Ditch Company Direct Flow Rights		**228.33**					**41.14**		**2,099.5 of 11,651.2 shares**
Lamar Canal Company	3	15.75	July 1, 1895	November 30, 1875	July 1, 1895	9465.00000	4.97	02CW181	8,247 of 26,127 shares
Lamar Canal Company	6.5	72.09	July 1, 1895	November 4, 1886	July 1, 1895	13457.00000	22.76	02CW181	8,247 of 26,127 shares
Lamar Canal Company	7.5	13.64	July 1, 1895	April 16, 1887	July 1, 1895	13620.00000	4.31	02CW181	8,247 of 26,127 shares
Lamar Canal Company	13	184.27	July 1, 1895	July 16, 1890	July 1, 1895	14807.00000	58.16	02CW181	8,247 of 26,127 shares
Lamar Canal Company	3	15.75	July 1, 1895	November 30, 1875	July 1, 1895	9465.00000	2.12	15CW3067	3,522.5 of 26,127 shares
Lamar Canal Company	6.5	72.09	July 1, 1895	November 4, 1886	July 1, 1895	13457.00000	9.71	15CW3067	3,522.5 of 26,127 shares
Lamar Canal Company	7.5	13.64	July 1, 1895	April 16, 1887	July 1, 1895	13620.00000	1.84	15CW3067	3,522.5 of 26,127 shares
Lamar Canal Company	13	184.27	July 1, 1895	July 16, 1890	July 1, 1895	14807.00000	24.83	15CW3067	3,522.5 of 26,127 shares
Total Lamar Canal Company Direct Flow Rights		**285.75**					**128.70**		**11,885 of 26,127 shares**
Manvel Canal	15	54.00	July 1, 1895	October 14, 1890	July 1, 1895	14897.00000	54.00	02CW181	54 cfs
Total Manvel Canal Company Direct Flow Rights		**54.00**					**54.00**		**54 cfs of 54 cfs**
X-Y Irrigating Ditch	11	69.00	July 1, 1895	July 22, 1889	July 1, 1895	14448.00000	67.00	02CW181	67 cfs of 69 cfs
X-Y Irrigating Ditch	11	69.00	July 1, 1895	July 22, 1889	July 1, 1895	14448.00000	2.00	15CW3067	2 cfs of 69 cfs
Total X-Y Irrigating Ditch Direct Flow Rights		**69.00**					**69.00**		**69 cfs of 69 cfs**

Table 1

Direct Flow Water Rights

Lower Arkansas Water Management Association

Replacement Source	Priority	Amount (cfs)	Original Case No.	Appropriation Date	Adjudication Date	Administration No.	LAWMA's Prorata Amount (cfs)	Case No.	Comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Stubbs Ditch	20	7.20	November 4, 1909	December 1, 1895	November 4, 1909	20570.15310	7.20	02CW181	7.2 cfs
Total Stubbs Ditch Direct Flow Rights		**7.20**					**7.20**		**54 cfs of 54 cfs**
Sisson Ditch	19	18.00	November 4, 1909	December 1, 1891	November 4, 1909	20570.15310	18.00	10CW85	18 cfs
Total Sisson Ditch Direct Flow Rights		**18.00**					**18.00**		**18 cfs of 18 cfs**

Table 2
Storage Water Rights
Lower Arkansas Water Management Association

Replacement Source	Description	Storage Priority	Amount (cfs)	Volume (ac-ft)	Original Case No.	Appropriation Date	Adjudication Date	LAWMA's Prorata Amount (cfs)	LAWMA's Prorata Volume (ac-ft)	Case No.	Comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Fort Lyon Canal Company	Horse Creek Reservoir	10	2000.00		November 8, 1928	August 15, 1900	November 8, 1928	159.78		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir	27.5	840.00	11,400	November 8, 1928	January 25, 1906	November 8, 1928	67.11	910.77	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir	50	1466.00		November 8, 1928	March 1, 1910	November 8, 1928	117.12		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 1st Enlargement	27.5	840.00		November 8, 1928	January 25, 1906	November 8, 1928	67.11		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 1st Enlargement	30.5	5000.00	15,487	November 8, 1928	December 20, 1907	November 8, 1928	399.46	1,237.29	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 1st Enlargement	50	1466.00		November 8, 1928	March 1, 1910	November 8, 1928	117.12		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 2nd Enlargement	37	5000.00		November 8, 1928	June 12, 1908	November 8, 1928	399.46		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 2nd Enlargement	37	840.00	1,113	November 8, 1928	June 12, 1908	November 8, 1928	67.11	88.93	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Horse Creek Reservoir 2nd Enlargement	50	1466.00		November 8, 1928	March 1, 1910	November 8, 1928	117.12		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir	27.5	8631.00		November 8, 1928	January 25, 1906	November 8, 1928	689.55		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir	27.5	840.00	61,575	November 8, 1928	January 25, 1906	November 8, 1928	67.11	4,919.35	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir	50	1466.00		November 8, 1928	March 1, 1910	November 8, 1928	117.12		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir Enlargement	41	8631.00		November 8, 1928	December 29, 1908	November 8, 1928	689.55		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir Enlargement	41	840.00	25,425	November 8, 1928	December 29, 1908	November 8, 1928	67.11	2,031.25	Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Adobe Creek Reservoir Enlargement	50	1466.00		November 8, 1928	March 1, 1910	November 8, 1928	117.12		Pending 19CW3036	7,509 of 93,989.4166 shares
Fort Lyon Canal Company	Thurston Reservoir		355.20	1,515	79CW85	August 12, 1889	April 8, 1905	28.38	121.04	Pending 19CW3036	7,509 of 93,989.4166 shares
Total Fort Lyon Canal Company Storage Flow Rights			**41,147.20**	**116,515**				**3,287.33**	**9,308.62**		**7,509 of 93,989.4166 shares**
Keesee Ditch	Article II Storage in John Martin Reservoir		50%	50%				50%	50%	02CW181	Half of Account
Keesee Ditch	Article II Storage in John Martin Reservoir		50%	50%				50%	50%	05CW52	Half of Account
Total Keesee Ditch Storage			**100%**	**100%**				**100%**	**100%**		**28.5 cfs of 28.5 cfs**
Fort Bent Ditch	Article II Storage in John Martin Reservoir		15.4%	15.4%				15.4%	15.4%	02CW181	15.4% of Account Releases
Fort Bent Ditch	Article II Storage in John Martin Reservoir		1.2%	1.2%				1.2%	1.2%	10CW85	1.2% of Account Releases
Fort Bent Ditch	Article II Storage in John Martin Reservoir		1.4%	1.4%				1.4%	1.4%	Pending 17CW3068	1.4% of Account Releases
Total Fort Bent Ditch Company			**18.0%**	**18.0%**				**18.0%**	**18.0%**		**2,099.5 of 11,651.2 shares**
Lamar Canal Company	Article II Storage in John Martin Reservoir		31.6%	31.6%				31.6%	31.6%	02CW181	31.6% of Account Releases
Lamar Canal Company	Article II Storage in John Martin Reservoir		13.5%	13.5%				13.5%	13.5%	15CW3067	13.5% of Account Releases
Total Lamar Canal Company			**45.0%**	**45.0%**				**45.0%**	**45.0%**		**11,769.5 of 26,127 shares**
Manvel Canal	Article II Storage in John Martin Reservoir		100%	100%				100%	100%	02CW181	Entire Account
Total Manvel Canal Company			**100%**	**100%**				**100%**	**100%**		**54 cfs of 54 cfs**
X-Y/Graham	Article II Storage in John Martin Reservoir		100%	100%				100%	100%	02CW181	Entire Account
Total X-Y Irrigating Ditch			**100%**	**100%**				**100%**	**100%**		**69 cfs of 69 cfs**
Stubbs Ditch	Article II Storage in John Martin Reservoir		100%	100%				100%	100%	02CW181	Entire Account
Total Stubbs Ditch			**100%**	**100%**				**100%**	**100%**		**54 cfs of 54 cfs**
Sisson Ditch	Article II Storage in John Martin Reservoir		100%	100%				100%	100%	10CW85	Entire Account
Total Sisson Ditch			**100%**	**100%**				**100%**	**100%**		**18 cfs of 18 cfs**

Table 3
CS-U Pilot Project Farms Study Period

Super Ditch ID No.	Ownership	Number of Catlin Shares	Number of CPW Shares	2015 Irrigated Acres	1985 Irrigated Acres	Claimed as Dry-up In Rule 14 Replacement Plan	First Year Claimed as Dry-up	Number of Consecutive Years as Dry-up	Study Period Use by Applicant	Proposed Study Period to Use
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Diamond A	1087.01	278.00	1088.86	1143.38	2003	2003	14	1988 to 2017	1973 to 2002
2	Schweizer	195.48	0.00	212.20	193.96	N/A	N/A	0	1988 to 2017	See Note*
5	Mameda	99.00	0.00	157.57	176.29	2003	2003	9	1988 to 2017	1973 to 2002
6	Groves	156.24	22.00	269.87	275.03	2008	2008	9	1988 to 2017	1978 to 2007
10	Mayhoffer	35.00	0.00	35.19	32.33	N/A	N/A	0	1988 to 2017	See Note*
Total		1572.73	300.00	1763.69	1820.99					

Note:

* The proposed Study Period is acceptable due to no parcels being dried up from 2003 to 2016

Column Explanation:

1 Identification number as provided by Applicants in the Catlin Pilot Project proposal dated July 14, 2014.
2 Farm ownership as provided by the Applicants in the Super Ditch Pilot Project application dated August 16, 2019 Table 2.
3 Number of Catlin Canal shares listed by the Applicants in the Super Ditch Pilot Project application dated August 16, 2019 Table 2.
4 Number of CPW shares listed by the Applicants in the Super Ditch Pilot Project application dated August 16, 2019 Table 2.
5 Irrigated acres identified in 2015 (Source is GIS coverages available from the Division 2 Engineer's Office)
6 Irrigated acres identified and agreed upon by Colorado and Kansas in 1985. (Source is GIS coverages available from the Division 2 Engineer's Office)
7 First year acres were identified as dried up for augmentation credits in a Rule 14 Plan. (Source is GIS coverages available from the Division 2 Engineer's Office)
8 First year a portion of the farm was claimed as dry up for augmentation credits in a Rule 14 plan. Additional details in Table 2 of this memorandum.
9 Maximum number of conesecutive years a parcel was claimed as dry up for augmentation credits in a Rule 14 plan.
10 Study period used by the Applicants from the appropriate Appendice for each farm.
11 Study period that should be used as part of the evaluation of consumptive use credits and return flow percentage in the project.

Table 4
CS-U Pilot Project Farms with Dry-Up Previously Claimed in a Rule 14 Repalcement Plan

PARCEL ID	IRRIG_TYPE	ACRES	IRR03	IRR04	IRR05	IRR06	IRR07	IRR08	IRR09	IRR10	IRR11	IRR12	IRR13	IRR14	IRR15	IRR16	DRYUPTXT16	TENYEAR16	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Diamond A																			
22573312	FLOOD	53.07	S	S	D	B	B	B	B	B	B	B	N	B	B			1 OF 10	
22573301	FLOOD	43.06	N	N	D	B	B	B	B	B	B	B	B	B	B			1 OF 10	
22573202	FLOOD	80.62	B	B	B	B	B	B	B	B	B	B	DN	DN	B			2 OF 10	
22572903	FLOOD	44.22	B	B	B	B	B	B	B	B	B	B	DN	B	B			1 OF 10	
22573009	DRY	31.81	S	S	D	S	S	S	S	S	S	S	S	S	DN	DN	CWPDA CATLIN DIAMOND A DRY-UP 16	3 OF 10	
22573304	FLOOD	12.27	S	S	D	B	B	B	B	B	B	B	B	B	B			1 OF 10	
22573305	DRIP	34.10	B	B	B	B	B	B	B	B	B	B	B	B	B	DG	CWPDA CATLIN DIAMOND A DRY-UP 16	1 OF 10	
22573310	DRY	21.49	D	D	D	D	D	D	D	D	D	D	N	N	N			10, INELIGIBLE UNTIL DECREED	
22573025	FLOOD	12.20	D	B	D	D	D	B	B	B	S	B	DN	DN	B			6 OF 10	
22573311	DRIP	29.79	B	B	B	B	B	B	B	B	B	B	B	B	B	DG	CWPDA CATLIN DIAMOND A DRY-UP 16	1 OF 10	
22572812	FLOOD	17.92	N	N	D	B	B	B	B	B	B	B	B	B	B			1 OF 10	
22573213	DRIP	29.03	B	B	B	B	B	B	B	B	B	B	B	B	B	DG	CWPDA CATLIN DIAMOND A DRY-UP 16	1 OF 10	
22572914	DRIP	28.94	D	B	B	B	B	B	B	B	B	B	DN	DN	DG	DG	CWPDA CATLIN DIAMOND A DRY-UP 16	5 OF 10	
22572906	DRIP	19.76	D	B	B	B	B	B	B	B	B	B	DN	DN	DG	DG	CWPDA CATLIN DIAMOND A DRY-UP 16	5 OF 10	
22573204	FLOOD	1.30	B	B	B	B	B	B	B	B	B	B	S	S	S			0	
22573114	FLOOD	23.09	S	S	S	S	S	S	S	S	S	S	S	DN	S			1 OF 10	
Groves																			
24560301	FLOOD	17.82	N	N	N	N	N	D	D	D	D	S	DN	DN	S			6 OF 10	
24560410	FLOOD	16.55	S	S	S	S	S	S	S	S	S	D	DN	S	S			2 OF 10	
24560405	FLOOD	35.73	S	S	S	S	S	D	D	D	D	S	S	S	S			4 OF 10	
24560409	DRY	39.56	B	B	B	B	S	B	B	B	B	B	B	B	DN			1 OF 10	
24560408	FLOOD	24.30	N	B	B	B	B	N	B	B	B	D	DN	B	B			2 OF 10	
24560419	FLOOD	12.85	S	S	S	S	S	D	D	D	D	S	S	S	S			4 OF 10	
24560423	FLOOD	14.14	S	S	S	S	S	N	S	S	S	D	DN	S	S			2 OF 10	
24560431	DRY	9.56	N	B	B	B	N	D	D	D	D	D	DN	DN	DN	DN	CWPDA CATLIN DIAMOND A DRY-UP 16	9 OF 10	
24560406	FLOOD	20.42	B	B	B	B	S	N	B	B	B	B	DN	DN	B			2 OF 10	
Mameda																			
23571115	FLOOD	5.95	D	D	G	N	N	D	D	D	D	D	DN	DG	G			10, INELIGIBLE UNTIL DECREED	
23571107	DRIP	24.48	G	G	G	G	G	G	G	G	G	G	DG	DG	G			10, INELIGIBLE UNTIL DECREED	
23571129	DRIP	21.85	G	G	G	G	G	G	G	G	G	G	DG	DG	G			10, INELIGIBLE UNTIL DECREED	
23571105	DRIP	23.97	G	G	G	G	G	G	G	G	G	G	DG	DG	G			10, INELIGIBLE UNTIL DECREED	
23571132	DRY	0.54	D	N	G	N	N	D	D	N	N	N	N	N	N			4 OF 10	
23571116	DRIP	23.31	G	G	G	G	G	G	G	G	G	G	DG	DG	G			10, INELIGIBLE UNTIL DECREED	
23571106	DRIP	57.46	N	N	G	G	G	G	G	G	G	G	DG	DG	DG	DG	AGUA CATLIN MAMEDA DRY-UP 16	10 OF 10	

Notes:

Years in which DEO assessed Dry-up

Parcel 22573204 attempted Dry-up but was disqualified in 2013 and excluded in 2014

Column Explanation:

1) Parcel identification number determined by the the Division 2 Engineer's Office.
2) Type of irrigation noted in 2016.
3) Acreage
4) Irrigation method in 2003; see below for codes.
5) Irrigation method in 2004; see below for codes.
6) Irrigation method in 2005; see below for codes.
7) Irrigation method in 2006; see below for codes.
8) Irrigation method in 2007; see below for codes.
9) Irrigation method in 2008; see below for codes.
10) Irrigation method in 2009; see below for codes.
11) Irrigation method in 2010; see below for codes.
12) Irrigation method in 2011; see below for codes.
13) Irrigation method in 2012; see below for codes.
14) Irrigation method in 2013; see below for codes.
15) Irrigation method in 2014; see below for codes.
16) Irrigation method in 2015; see below for codes.
17) Irrigation method in 2016; see below for codes.
18) Comments from the Division 2 Engineer's Office.
19) Ten year total of Dry-Up rotation as of 2016
20) Additional comments from the Division 2 Engineer's Office.

Coding Explanation for Columns 4 through 17

a) N = not irrigated
b) S = irrigated with surface water
c) G = irrigated with ground water
d) D = parcel was dried up that year
e) L = dryland farmed
f) B = irrigated with both surface and ground water
g) DN = not irrigated dry-up parcel (2013-2016 only)
h) DG = ground water irrigated dry up parcel (2013-2016 only)
i) DL = dryland farmed dry-up parcel (2013-2016 only)

Table 5
CS-U Pilot Project Farms with Dry-Up Previously Claimed in a Rule 14 Replacement Plan

PARCEL_ID	IRRIG_TYPE	ACRES	IDENTIFIED BY DEO IN 2016 AS PART OF 12CW94	PARCEL LOCATED WITHIN 12CW94 LANDS
(1)	(2)	(3)	(4)	(5)
22573312	FLOOD	53.07	TRUE	TRUE
22573301	FLOOD	43.06	TRUE	TRUE
24560301	FLOOD	17.82	TRUE	TRUE
24560410	FLOOD	16.55	TRUE	TRUE
22573202	FLOOD	80.62	TRUE	TRUE
24560405	FLOOD	35.73	TRUE	TRUE
22572903	FLOOD	44.22	TRUE	TRUE
22573009	DRY	31.81	TRUE	TRUE
22573304	FLOOD	12.27	TRUE	TRUE
22573305	DRIP	34.10	TRUE	TRUE
22573310	DRY	21.49	TRUE	TRUE
23571115	FLOOD	5.95	TRUE	TRUE
24560409	DRY	39.56	TRUE	TRUE
24560408	FLOOD	24.30	TRUE	TRUE
22573025	FLOOD	12.20	TRUE	TRUE
22573311	DRIP	29.79	TRUE	TRUE
22572812	FLOOD	17.92	TRUE	TRUE
23571107	DRIP	24.48	TRUE	TRUE
23571129	DRIP	21.85	TRUE	TRUE
23571105	DRIP	23.97	TRUE	TRUE
23571132	DRY	0.54	TRUE	TRUE
22573213	DRIP	29.03	TRUE	TRUE
24560419	FLOOD	12.85	TRUE	TRUE
24560423	FLOOD	14.14	TRUE	TRUE
24560431	DRY	9.56	TRUE	TRUE
24560406	FLOOD	20.42	TRUE	TRUE
22572914	DRIP	28.94	TRUE	TRUE
22572906	DRIP	19.76	TRUE	TRUE
23571116	DRIP	23.31	TRUE	TRUE
23571106	DRIP	57.46	TRUE	TRUE
22573114	FLOOD	23.09	TRUE	FALSE
23570510	FLOOD	31.71	FALSE	TRUE
22573214	FLOOD	47.63	FALSE	TRUE
22573227	FLOOD	26.80	FALSE	TRUE
23570506	FLOOD	15.30	FALSE	TRUE
22573024	FLOOD	14.05	FALSE	TRUE
22573010	FLOOD	17.55	FALSE	TRUE
22573026	FLOOD	28.09	FALSE	TRUE
22572001	FLOOD	21.54	FALSE	TRUE
22572910	FLOOD	31.93	FALSE	TRUE
22572902	FLOOD	53.74	FALSE	TRUE
22573210	FLOOD	45.30	FALSE	TRUE
22573211	FLOOD	53.26	FALSE	TRUE
23570509	FLOOD	9.95	FALSE	TRUE
23570542	NONE	5.08	FALSE	TRUE
22573308	FLOOD	45.28	FALSE	TRUE
22573306	FLOOD	18.28	FALSE	TRUE

Table 5
CS-U Pilot Project Farms with Dry-Up Previously Claimed in a Rule 14 Replacement Plan

PARCEL_ID	IRRIG_TYPE	ACRES	IDENTIFIED BY DEO IN 2016 AS PART OF 12CW94	PARCEL LOCATED WITHIN 12CW94 LANDS
(1)	(2)	(3)	(4)	(5)
22573317	FLOOD	44.01	FALSE	TRUE
22572912	FLOOD	21.69	FALSE	TRUE
22572002	FLOOD	21.33	FALSE	TRUE
22573204	FLOOD	1.30	FALSE	TRUE
22573203	FLOOD	12.18	FALSE	TRUE
22573316	FLOOD	40.12	FALSE	TRUE
22573201	FLOOD	28.99	FALSE	TRUE
23570520	FLOOD	9.69	FALSE	TRUE

Column Explanation:

1) Parcel identification number determined by the the Division 2 Engineer's Office.

2) Type of irrigation noted in 2016.

3) Acreage

4) Parcels identified in the IRALL_D2_16 shapefile by the Division 2 Engineer's Office as part of case 12CW94 in 2016

5) Parcels that are located within areas identified as Dry-Up Parcels in 12CW94

Table 6
CS-U Pilot Project Farms Parcels Associated with Wells

PARCEL_ID	IRRIG_TYPE	ACRES	GW_ID1	GW_ID2	GW_ID3	GW_ID4
(1)	(2)	(3)	(4)	(5)	(6)	(7)
22573312	FLOOD	53.07	1705268	1705269	1705393	
22573301	FLOOD	43.06	1705268			
22573202	FLOOD	80.62	1705254	1705257		
22573214	FLOOD	47.63	1705254	1705257		
22573227	FLOOD	26.80	1705254			
22572903	FLOOD	44.22	1705259			
22573304	FLOOD	12.27	1705248			
22573305	DRIP	34.10	1705268	1705269	1705393	
23571115	FLOOD	5.95	1705556	1705557	1705558	
24560409	DRY	39.56	1705529	1705530		
24560408	FLOOD	24.30	1705529	1705530		
24560424	FLOOD	11.54	1705528			
22573024	FLOOD	14.05	1705244			
22573025	FLOOD	12.20	1705244			
22573010	FLOOD	17.55	1705244			
22573026	FLOOD	28.09	1705244			
22572001	FLOOD	21.54	1705259			
22572910	FLOOD	31.93	1705259			
22572902	FLOOD	53.74	1705259			
22573210	FLOOD	45.30	1705254	1705257	1705260	
22573211	FLOOD	53.26	1705254	1705257	1705260	
22573308	FLOOD	45.28	1705268	1705269	1705393	
22573306	FLOOD	18.28	1705268	1705269	1705393	
22573317	FLOOD	44.01	1705268	1705269	1705393	
22573311	DRIP	29.79	1705268	1705269	1705393	
22572812	FLOOD	17.92	1705268			
23571107	DRIP	24.48	1705556	1705557	1705558	
23571129	DRIP	21.85	1705556	1705557	1705558	
23571105	DRIP	23.97	1705556	1705557	1705558	
23571132	DRY	0.54	1705556	1705557	1705558	
22573213	DRIP	29.03	1705254	1705257		
24560407	FLOOD	11.50	1705528			
24560422	FLOOD	14.49	1705528			
24560505	FLOOD	7.66	1705528			
24560528	FLOOD	4.86	1705528			
24560529	FLOOD	3.35	1705528			
22573012	FLOOD	10.40	1705916			
22573103	FLOOD	17.02	1705916			
22572912	FLOOD	21.69	1705259			
22572002	FLOOD	21.33	1705259			
24560431	DRY	9.56	1705529	1705530		
24560406	FLOOD	20.42	1705529	1705530		
22572914	DRIP	28.94	1705257			
22572906	DRIP	19.76	1705257			

Table 6
CS-U Pilot Project Farms Parcels Associated with Wells

PARCEL_ID	IRRIG_TYPE	ACRES	GW_ID1	GW_ID2	GW_ID3	GW_ID4
(1)	(2)	(3)	(4)	(5)	(6)	(7)
22573204	FLOOD	1.30	1705254	1705257		
22573203	FLOOD	12.18	1705254	1705257		
24560425	FLOOD	11.86	1705528			
24560411	FLOOD	13.67	1705528			
23571116	DRIP	23.31	1705556	1705557	1705558	
23571106	DRIP	57.46	1705556	1705557	1705558	
22573316	FLOOD	40.12	1705268	1705269	1705393	
22573201	FLOOD	28.99	1705254	1705257		
23570507	FLOOD	23.00	1705772	1705773	1705774	1705775
23570521	FLOOD	2.27	1705772	1705773	1705774	1705775
23570516	SPRINKLER	105.49	1705772	1705773	1705774	1705775

Column Explanation:

1) Parcel identification number determined by the the Division 2 Engineer's Of
2) Type of irrigation noted in 2016.
3) Acreage
4) 1st Well WDID Associated with the parcel in Column 1
5) 2nd Well WDID Associated with the parcel in Column 1
6) 3rd Well WDID Associated with the parcel in Column 1
7) 4th Well WDID Associated with the parcel in Column 1

Table 7 Summary - Summary Period Average and Maximum Values for Selected Variables

Farm Name or Parcel Designation: Diamond_A

Summary Period: 1973 - 2002

Notes:

Period	Farm Shares	Farm Acres	App. Eff.	Alfalfa (%)	Grass (%)	Corn_Grn (%)	Corn_Sil (%)	Spr_Grn (%)	Sorghum (%)	Win_Wht (%)	Vegetable (%)	Beans (%)	Beets (%)
Average	1087.0	859.2	0.55	39.17%	7.10%	25.96%	6.51%	1.67%	3.26%	7.75%	5.89%	1.69%	1.00%
Maximum	1087.0	866.9	0.55	52.25%	10.00%	36.40%	12.00%	2.20%	6.00%	12.79%	8.00%	2.40%	5.00%
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)
River Headgate Diversions													
Average	202.8	227.2	6188.1	10364.0	10844.2	14997.9	15095.4	12793.1	8288.7	7120.8	3640.1	266.8	90029.2
Farm Headgate Delivery													
Average	9.4	10.5	286.9	480.6	502.8	695.5	700.0	593.2	384.3	330.2	168.8	12.4	4174.6
Maximum	106.8	79.2	655.0	818.7	804.3	905.3	963.4	988.9	735.4	585.0	275.9	262.1	6022.5
Max3	80.0	71.7	578.2	812.3	767.1	880.9	920.2	903.5	648.2	546.4	270.4	123.7	5821.7
Max10yr	282.1	217.0	3859.2	6860.3	6576.3	7616.9	7946.0	7219.2	5475.9	4538.5	1876.4	371.2	51281.8
Farm Crop Potential Evapotranspiration													
Average	29.5	35.0	62.8	207.1	329.7	484.3	559.9	444.9	268.5	62.0	36.8	30.2	2550.7
Farm Effective Precipitation													
Average	19.4	21.1	58.1	75.7	117.9	89.9	118.1	102.6	56.8	45.8	30.9	22.0	758.4
Farm Irrigation Water Requirement													
Average	13.8	17.4	17.5	136.4	211.8	394.4	441.7	342.3	211.7	28.1	15.4	12.7	1843.2
Farm Crop Irrigation Requirement Met by Irrigation Water Applied or in Soil Moisture													
Average	13.1	15.5	16.0	130.3	201.6	373.6	400.0	304.1	173.1	23.6	13.3	11.4	1675.5
Maximum	32.1	40.5	61.5	289.8	326.5	512.2	568.5	474.9	311.1	71.3	38.8	36.5	1958.1
Max3	29.9	36.7	57.3	257.1	314.6	491.7	540.2	457.1	292.3	68.1	37.7	33.5	1938.4
Max10yr	158.0	212.5	206.6	1542.0	2320.2	3837.4	4312.8	3608.1	2293.9	341.1	212.4	167.1	17848.4
Total Return Flows at Farm													
Average	5.1	5.7	222.4	355.6	314.8	339.6	340.0	289.9	215.4	268.9	135.0	6.6	2498.9
Tailwater/Surface Runoff Return Flows at Farm													
Average	0.9	1.0	27.7	46.4	48.5	67.1	67.5	57.2	37.1	31.9	16.3	1.2	402.9
Deep Percolation/Ground Water Return Flows at Farm (unlagged)													
Average	4.2	4.7	194.7	309.2	266.3	272.5	272.5	232.7	178.3	237.0	118.8	5.4	2096.1
Historical Depletions at Farm													
Average	4.3	4.8	64.6	125.0	188.0	355.9	359.9	303.3	169.0	61.3	33.8	5.8	1675.7
Maximum	58.7	40.9	159.1	237.1	326.5	466.1	481.3	493.8	321.3	242.3	151.8	144.2	2017.4
Max3	39.1	36.0	141.1	225.4	311.0	458.8	465.7	473.9	304.2	212.9	148.7	58.2	1971.1
Max10yr	130.1	90.6	910.0	1542.0	2240.9	3723.8	3961.6	3710.0	2185.4	889.7	718.7	174.7	17973.2
Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased													
Average	4.1	8.5	200.6	492.3	714.8	920.5	1108.7	1243.0	1314.0	1440.3	1443.9	1336.2	1455.7
Maximum	48.9	101.5	573.3	1017.7	1429.1	1627.8	1907.6	2087.3	2353.5	2615.7	2592.3	2386.8	2592.3
Max3	36.3	66.7	452.2	955.6	1330.4	1573.1	1790.4	1941.0	2119.2	2397.2	2394.9	2206.4	2394.9
Delayed Return Flows Remaining to Stream as Percent of Cumulative Farm Headgate Deliveries													
Average	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum	71.2%	68.7%	88.8%	82.9%	75.6%	64.0%	53.6%	47.4%	45.8%	45.7%	43.4%	39.9%	43.4%
Max3			84.0%	81.1%	69.8%	57.1%	50.2%	45.6%	43.9%	44.5%	42.3%	39.0%	42.5%
Deep Percolation/Ground Water Return Flows at Stream (lagged)													
Average	169.7	151.7	139.2	142.2	159.2	175.3	187.0	195.9	198.7	195.8	194.5	187.1	2096.1
Total Return Flows at Stream													
Average	170.6	152.7	166.8	188.5	207.7	242.4	254.5	253.1	235.8	227.7	210.8	188.2	2498.9
Historical Depletions at Stream from Farm Headgate Deliveries													
Average	-161.2	-142.1	120.1	292.1	295.2	453.1	445.5	340.1	148.6	102.5	-42.0	-175.9	1675.7
Maximum	28.2	-12.7	361.7	587.2	506.4	664.9	630.1	680.5	356.4	242.8	142.2	170.2	2526.2
Max3	-19.1	-31.2	326.9	543.7	484.9	638.3	622.4	617.2	341.1	218.3	137.3	18.5	2426.5
Max10yr	-693.9	-667.4	1607.9	4330.0	3715.4	4937.6	5090.9	4432.4	2339.6	1586.9	546.4	-754.3	19291.5
Historical Depletions at Stream from River Diversions (Considering Off-Farm Canal Losses)													
Average	-244.3	-215.8	123.7	345.2	347.9	547.4	531.3	389.3	139.4	80.6	-101.2	-267.9	1675.7
Maximum	6.1	-46.5	431.7	723.3	619.3	820.7	763.8	829.1	405.2	257.3	149.0	189.1	2813.0
Max3	-52.7	-67.0	388.9	667.2	590.7	787.6	758.1	747.5	384.3	225.8	136.5	-7.1	2654.4
Max10yr	-1226.8	-1161.3	1756.6	5251.4	4446.7	6013.4	6141.9	5218.1	2466.1	1484.3	276.5	-1357.7	19929.7
On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery													
Depletions	46.1%	45.9%	22.5%	26.0%	37.4%	51.2%	51.4%	51.1%	44.0%	18.6%	20.0%	47.1%	40.1%
TW Return	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
DP Returns	44.2%	44.4%	67.8%	64.3%	53.0%	39.2%	38.9%	39.2%	46.4%	71.8%	70.4%	43.3%	50.2%
Stream Depletion and RF Factors: Average Monthly Depletions and Returns at Stream as a percent of Average Farm Headgate Delivery													
Notes: Factors are for use with permanent dry-up; Depl/RF Factors percent of monthly FHGD, Winter RF Factors percent of total annual FHGD													
Depletion Factors			41.9%	60.8%	58.7%	65.1%	63.6%	57.3%	38.7%	31.0%			40.1%
Return Flow Factors			58.1%	39.2%	41.3%	34.9%	36.4%	42.7%	61.3%	69.0%			59.9%
Winter RF	-1.9%	-1.7%									-0.5%	-2.1%	

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LFTparcels worksheet

Table 8 Summary - Summary Period Average and Maximum Values for Selected Variables

Farm Name or Parcel Designation: Schweizer

Summary Period: 1988 - 2017

Notes:

Period	Farm Shares	Farm Acres	App. Eff.	Alfalfa (%)	Grass (%)	Corn_Grn (%)	Corn_Sil (%)	Spr_Grn (%)	Sorghum (%)	Win_Wht (%)	Vegetable (%)	Beans (%)	Beets (%)
Average	195.5	206.2	0.55	46.58%	8.17%	22.89%	3.45%	0.90%	3.05%	8.82%	4.91%	1.23%	0.00%
Maximum	195.5	212.2	0.55	76.98%	20.80%	36.40%	10.37%	2.20%	18.32%	15.98%	9.31%	2.40%	0.00%
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)
River Headgate Diversions													
Average	0.0	66.9	6358.4	11649.1	12338.1	15155.7	14522.4	12718.0	8962.0	8340.1	3930.2	0.0	94041.0
Farm Headgate Delivery													
Average	0.0	0.6	53.0	97.1	102.9	126.4	121.1	106.1	74.7	69.5	32.8	0.0	784.2
Maximum	0.0	13.4	117.8	147.2	144.6	162.8	173.3	177.8	132.2	113.3	55.9	0.0	1083.0
Max3	0.0	5.6	97.9	146.4	136.3	158.2	162.3	152.8	120.2	106.8	53.9	0.0	1046.9
Max10yr	0.0	16.7	694.0	1233.7	1182.6	1369.7	1428.9	1266.9	984.7	816.2	377.0	0.0	9222.0
Farm Crop Potential Evapotranspiration													
Average	7.4	8.2	16.8	59.9	90.7	123.0	132.5	109.4	70.7	15.8	8.9	7.0	650.3
Farm Effective Precipitation													
Average	5.0	5.9	12.5	21.4	24.8	23.5	31.0	28.2	14.3	13.6	7.2	6.0	193.4
Farm Irrigation Water Requirement													
Average	3.2	3.7	6.5	39.9	66.4	99.5	101.5	81.2	56.4	7.4	4.1	3.0	472.8
Farm Crop Irrigation Requirement Met by Irrigation Water Applied or in Soil Moisture													
Average	1.9	2.4	5.2	33.5	55.9	85.0	81.6	63.0	42.5	6.0	2.6	1.9	381.6
Maximum	7.8	9.8	18.4	70.9	100.1	120.4	130.3	115.7	74.3	18.3	9.5	7.6	496.2
Max3	6.9	8.1	15.6	63.3	93.0	118.5	121.5	100.8	69.6	17.7	9.2	7.5	468.7
Max10yr	37.1	46.4	94.4	444.2	744.5	922.4	974.6	764.5	519.6	71.3	33.1	33.8	4159.6
Total Return Flows at Farm													
Average	0.0	0.3	34.8	64.8	54.7	57.4	54.5	47.7	33.6	35.9	18.9	0.0	402.6
Tailwater/Surface Runoff Return Flows at Farm													
Average	0.0	0.1	5.1	9.4	9.9	12.2	11.7	10.2	7.2	6.7	3.2	0.0	75.7
Deep Percolation/Ground Water Return Flows at Farm (unlagged)													
Average	0.0	0.2	29.7	55.4	44.8	45.2	42.8	37.5	26.4	29.2	15.7	0.0	326.9
Historical Depletions at Farm													
Average	0.0	0.3	18.2	32.4	48.2	69.0	66.6	58.3	41.1	33.7	13.9	0.0	381.6
Maximum	0.0	7.4	39.1	66.9	72.1	89.5	95.3	97.8	72.7	62.3	30.8	0.0	491.8
Max3	0.0	3.1	34.5	64.2	71.5	87.0	89.3	84.1	66.1	54.8	29.6	0.0	465.8
Max10yr	0.0	9.2	201.3	384.1	611.5	738.8	784.7	696.8	541.6	417.5	188.5	0.0	4201.0
Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased													
Average	0.0	0.1	17.8	40.8	44.1	44.2	41.8	38.0	29.8	28.0	19.6	7.0	21.1
Maximum	0.0	2.8	57.8	86.5	92.6	63.2	54.0	56.5	50.0	61.5	43.7	16.5	43.7
Max3	0.0	1.2	44.1	76.9	76.5	59.7	53.5	50.1	43.1	56.0	39.0	14.4	39.0
Delayed Return Flows Remaining to Stream as Percent of Cumulative Farm Headgate Deliveries													
Average	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum		21.1%	46.4%	38.6%	27.2%	15.7%	10.1%	7.9%	6.0%	6.6%	4.2%	1.5%	4.2%
Max3			45.5%	38.4%	24.7%	14.8%	9.9%	7.6%	5.6%	6.2%	4.1%	1.5%	4.1%
Deep Percolation/Ground Water Return Flows at Stream (lagged)													
Average	5.4	1.7	12.0	32.4	41.5	45.1	45.2	41.3	34.7	30.9	24.1	12.6	326.9
Total Return Flows at Stream													
Average	5.4	1.7	17.2	41.8	51.4	57.3	56.9	51.5	41.9	37.6	27.3	12.6	402.6
Historical Depletions at Stream from Farm Headgate Deliveries													
Average	-5.4	-1.1	35.9	55.4	51.5	69.1	64.2	54.6	32.9	31.9	5.5	-12.6	381.6
Maximum	0.0	7.0	66.7	94.8	87.4	101.6	99.9	100.2	66.3	69.3	30.8	0.0	486.3
Max3	-0.4	2.4	59.4	90.1	84.1	93.6	89.8	85.0	63.8	54.7	26.4	-1.0	465.6
Max10yr	-43.2	-3.1	437.1	682.8	686.0	750.7	752.9	667.6	471.6	397.4	125.5	-99.7	4204.0
Historical Depletions at Stream from River Diversions (Considering Off-Farm Canal Losses)													
Average	-8.6	-1.9	43.9	65.6	56.6	74.2	65.1	52.5	26.9	28.6	-1.3	-20.2	381.6
Maximum	0.0	7.9	83.6	112.4	99.0	114.2	106.9	106.0	67.6	74.4	31.6	0.0	485.5
Max3	-0.7	2.6	73.4	106.4	94.2	105.7	97.3	88.4	62.1	54.8	24.0	-1.7	465.9
Max10yr	-70.1	-7.9	540.6	816.4	767.2	803.7	775.5	659.6	422.1	381.7	76.9	-164.4	4203.6
On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery													
Depletions		55.0%	34.3%	33.3%	46.9%	54.6%	55.0%	55.0%	55.0%	48.4%	42.5%		48.7%
TW Returns		9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%		9.7%
DP Returns		35.4%	56.1%	57.0%	43.5%	35.8%	35.4%	35.4%	35.4%	41.9%	47.9%		41.7%
Stream Depletion and RF Factors: Average Monthly Depletions and Returns at Stream as a percent of Average Farm Headgate Delivery													
Notes: Factors are for use with permanent dry-up; Depl/RF Factors percent of monthly FHGD, Winter RF Factors percent of total annual FHGD													
Depletion Factors			67.6%	57.0%	50.0%	54.6%	53.0%	51.4%	44.0%	45.9%	16.7%		48.7%
Return Flow Factors			32.4%	43.0%	50.0%	45.4%	47.0%	48.6%	56.0%	54.1%	83.3%		51.3%
Winter RF	-0.3%	-0.1%										-0.8%	

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Table 9 Summary - Summary Period Average and Maximum Values for Selected Variables

Farm Name or Parcel Designation: Mameda

Summary Period: 1973 - 2002

Notes:

Period	Farm Shares	Farm Acres	App. Eff.	Alfalfa (%)	Grass (%)	Corn_Grn (%)	Corn_Sil (%)	Spr_Grn (%)	Sorghum (%)	Win_Wht (%)	Vegetable (%)	Beans (%)	Beets (%)
Average	99.0	151.1	0.55	39.17%	7.10%	25.96%	6.51%	1.67%	3.26%	7.75%	5.89%	1.69%	1.00%
Maximum	99.0	155.4	0.55	52.25%	10.00%	36.40%	12.00%	2.20%	6.00%	12.79%	8.00%	2.40%	5.00%
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)
River Headgate Diversions													
Average	202.8	227.2	6188.1	10364.0	10844.2	14997.9	15095.4	12793.1	8288.7	7120.8	3640.1	266.8	90029.2
Farm Headgate Delivery													
Average	0.9	1.0	26.1	43.8	45.8	63.3	63.8	54.0	35.0	30.1	15.4	1.1	380.2
Maximum	9.7	7.2	59.7	74.6	73.3	82.4	87.7	90.1	67.0	53.3	25.1	23.9	548.5
Max3	7.3	6.5	52.7	74.0	69.9	80.2	83.8	82.3	59.0	49.8	24.6	11.3	530.2
Max10yr	25.7	19.8	351.5	624.8	598.9	693.7	723.7	657.5	498.7	413.4	170.9	33.8	4670.5
Farm Crop Potential Evapotranspiration													
Average	5.2	6.2	11.1	36.4	58.0	85.2	98.4	78.3	47.3	10.9	6.5	5.3	448.6
Farm Effective Precipitation													
Average	3.4	3.7	10.3	13.3	20.8	15.8	20.8	18.1	10.0	8.1	5.5	3.9	133.6
Farm Irrigation Water Requirement													
Average	2.4	3.1	3.1	24.0	37.3	69.3	77.6	60.2	37.3	4.9	2.7	2.2	324.0
Farm Crop Irrigation Requirement Met by Irrigation Water Applied or in Soil Moisture													
Average	0.6	1.0	2.3	16.6	29.5	51.5	45.5	33.5	20.2	3.9	2.0	0.7	207.4
Maximum	3.5	4.1	10.4	40.4	59.0	83.2	76.8	66.5	37.8	13.0	7.1	5.6	293.2
Max3	2.7	3.7	9.3	36.0	54.7	78.1	70.7	53.0	35.2	12.0	6.6	4.6	278.3
Max10yr	8.5	15.2	27.7	240.3	405.6	628.2	560.3	417.3	292.0	58.9	32.0	11.0	2517.7
Total Return Flows at Farm													
Average	0.4	0.4	11.8	20.5	21.6	28.5	28.7	24.3	15.8	13.5	6.9	0.5	172.8
Tailwater/Surface Runoff Return Flows at Farm													
Average	0.1	0.1	2.5	4.2	4.4	6.1	6.2	5.2	3.4	2.9	1.5	0.1	36.7
Deep Percolation/Ground Water Return Flows at Farm (unlagged)													
Average	0.3	0.3	9.2	16.2	17.2	22.4	22.5	19.1	12.4	10.6	5.4	0.4	136.1
Historical Depletions at Farm													
Average	0.5	0.5	14.4	23.3	24.2	34.8	35.1	29.7	19.3	16.5	8.5	0.6	207.4
Maximum	5.3	4.0	32.8	40.7	40.3	45.3	48.3	49.5	36.8	29.3	13.8	13.1	301.7
Max3	4.0	3.6	29.0	40.0	38.4	44.1	46.1	45.3	32.5	27.4	13.5	6.2	278.9
Max10yr	14.1	10.9	193.3	333.4	299.9	381.5	398.0	361.6	274.3	227.3	94.0	18.6	2516.6
Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased													
Average	0.3	0.6	9.9	26.0	43.1	65.1	86.9	104.7	115.2	123.3	125.5	122.1	126.0
Maximum	3.4	5.4	23.4	49.3	93.9	113.3	141.0	170.5	190.8	205.2	207.9	201.6	207.9
Max3	2.6	4.7	19.6	47.9	76.8	102.0	128.1	151.2	167.8	181.4	184.1	178.5	184.1
Delayed Return Flows Remaining to Stream as Percent of Cumulative Farm Headgate Deliveries													
Average	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum	35.3%	35.3%	35.3%	48.4%	54.5%	49.5%	45.3%	42.5%	40.8%	39.4%	38.2%	37.0%	38.2%
Max3			35.3%	42.6%	45.8%	42.6%	40.3%	38.8%	37.6%	36.6%	35.6%	34.6%	35.8%
Deep Percolation/Ground Water Return Flows at Stream (lagged)													
Average	11.9	11.8	11.5	11.2	11.0	10.8	10.8	10.9	11.2	11.5	11.7	11.9	136.1
Total Return Flows at Stream													
Average	12.0	11.9	14.1	15.5	15.4	16.9	16.9	16.1	14.5	14.4	13.2	12.0	172.8
Historical Depletions at Stream from Farm Headgate Deliveries													
Average	-11.1	-10.9	12.1	28.3	30.4	46.5	46.8	37.9	20.5	15.7	2.1	-10.9	207.4
Maximum	1.0	-2.4	37.5	55.3	51.9	62.6	63.9	67.1	45.7	32.7	14.1	13.5	317.2
Max3	-2.5	-3.3	33.3	53.3	50.0	61.5	62.8	64.1	40.3	29.8	13.5	1.3	302.8
Max10yr	-63.4	-67.2	176.8	428.2	406.4	499.1	522.8	471.1	314.6	233.6	68.1	-55.8	2539.2
Historical Depletions at Stream from River Diversions (Considering Off-Farm Canal Losses)													
Average	-19.5	-19.1	10.5	31.5	34.3	55.0	55.5	44.0	21.5	15.2	-2.3	-19.1	207.4
Maximum	-2.1	-6.4	41.9	65.9	60.6	77.0	77.0	82.2	52.8	36.0	14.3	13.8	335.3
Max3	-7.2	-8.1	36.8	62.8	58.7	74.5	75.9	77.9	46.4	32.7	13.4	-2.3	316.1
Max10yr	-119.5	-123.7	167.3	492.6	464.9	587.3	615.8	557.1	346.6	242.1	49.9	-109.7	2569.7
On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery													
Depletions	55.0%	55.0%	55.0%	53.3%	52.9%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%	54.5%
TW Return	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
DP Returns	35.4%	35.4%	35.4%	37.1%	37.5%	35.4%	35.4%	35.4%	35.4%	35.4%	35.4%	35.4%	35.8%
Stream Depletion and RF Factors: Average Monthly Depletions and Returns at Stream as a percent of Average Farm Headgate Delivery													
Notes: Factors are for use with permanent dry-up; Depl/RF Factors percent of monthly FHGD, Winter RF Factors percent of total annual FHGD													
Depletion Factors			46.2%	64.7%	66.4%	73.3%	73.5%	70.2%	58.5%	52.1%	13.9%		54.5%
Return Flow Factors			53.8%	35.3%	33.6%	26.7%	26.5%	29.8%	41.5%	47.9%	86.1%		45.5%
Winter RF	-1.5%	-1.4%										-1.4%	

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LFTparcels worksheet

Table 10 Summary - Summary Period Average and Maximum Values for Selected Variables

Farm Name or Parcel Designation: Groves

Summary Period: 1978 - 2007

Notes:

Period	Farm Shares	Farm Acres	App. Eff.	Alfalfa (%)	Grass (%)	Corn_Grn (%)	Corn_Sil (%)	Spr_Grn (%)	Sorghum (%)	Win_Wht (%)	Vegetable (%)	Beans (%)	Beets (%)
Average	156.2	213.8	0.55	43.26%	7.56%	24.78%	4.62%	1.33%	2.46%	8.13%	6.21%	1.47%	0.17%
Maximum	156.2	258.4	0.55	76.98%	20.80%	36.40%	12.00%	2.20%	6.00%	12.79%	9.31%	2.40%	5.00%
Month	Jan (AF or %)	Feb (AF or %)	Mar (AF or %)	Apr (AF or %)	May (AF or %)	Jun (AF or %)	Jul (AF or %)	Aug (AF or %)	Sep (AF or %)	Oct (AF or %)	Nov (AF or %)	Dec (AF or %)	Total (AF or %)
River Headgate Diversions													
Average	76.8	115.5	6146.5	10863.9	11493.5	15034.2	15157.4	13355.5	8872.8	7750.1	3654.7	0.0	92520.8
Farm Headgate Delivery													
Average	0.5	0.8	41.0	72.4	76.6	100.2	101.0	89.0	59.1	51.7	24.4	0.0	616.6
Maximum	15.3	10.7	94.1	117.7	115.6	130.1	138.5	142.1	105.7	84.1	43.1	0.0	865.6
Max3	5.1	7.4	83.1	116.8	110.3	126.3	132.3	129.9	93.2	81.4	39.1	0.0	836.8
Max10yr	15.3	13.4	554.7	986.1	945.2	1094.8	1142.1	1037.6	787.1	652.3	269.7	0.0	7370.9
Farm Crop Potential Evapotranspiration													
Average	7.4	8.5	16.0	55.6	85.7	122.3	138.2	109.7	68.2	15.9	9.2	7.4	644.1
Farm Effective Precipitation													
Average	5.3	5.6	14.4	20.3	29.1	24.7	29.5	26.1	14.3	12.1	7.2	6.2	195.0
Farm Irrigation Water Requirement													
Average	3.2	3.9	4.5	36.5	56.6	97.5	108.7	83.6	53.9	7.3	4.2	2.7	462.5
Farm Crop Irrigation Requirement Met by Irrigation Water Applied or in Soil Moisture													
Average	0.7	1.5	3.5	27.8	45.9	76.0	71.0	53.2	33.6	6.1	3.1	0.8	323.2
Maximum	5.9	6.1	18.0	55.9	80.9	110.5	102.7	101.8	60.4	19.2	11.4	7.2	413.4
Max3	4.6	5.9	15.8	55.3	75.5	109.0	101.7	86.6	55.5	17.4	10.8	5.9	400.2
Max10yr	15.8	29.0	39.8	352.7	548.0	865.5	844.7	661.8	444.8	101.7	55.2	19.0	3679.5
Total Return Flows at Farm													
Average	0.5	0.5	21.4	41.5	37.6	45.1	45.5	40.1	26.6	23.7	12.2	0.0	294.5
Tailwater/Surface Runoff Return Flows at Farm													
Average	0.0	0.1	4.0	7.0	7.4	9.7	9.7	8.6	5.7	5.0	2.4	0.0	59.5
Deep Percolation/Ground Water Return Flows at Farm (unlagged)													
Average	0.5	0.4	17.5	34.5	30.2	35.5	35.7	31.5	20.9	18.7	9.8	0.0	235.0
Historical Depletions at Farm													
Average	0.0	0.3	19.5	31.0	39.0	55.1	55.6	49.0	32.5	28.0	12.2	0.0	322.1
Maximum	0.4	5.9	43.3	64.2	63.6	71.6	76.2	78.2	58.1	46.2	23.7	0.0	435.8
Max3	0.1	2.6	37.3	57.3	60.6	69.5	72.7	71.4	51.2	43.2	21.5	0.0	409.3
Max10yr	0.4	7.4	267.9	451.2	454.3	602.1	628.2	570.7	432.9	356.3	146.5	0.0	3727.8
Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased													
Average	0.3	0.4	10.4	25.7	32.4	41.1	47.3	49.5	45.5	42.3	34.8	23.9	36.1
Maximum	7.9	8.9	34.2	57.5	74.1	64.5	71.4	77.8	74.1	67.9	54.0	36.8	54.0
Max3	2.6	3.9	29.9	55.0	60.8	62.4	67.5	68.6	64.6	61.6	52.5	35.3	52.5
Delayed Return Flows Remaining to Stream as Percent of Cumulative Farm Headgate Deliveries													
Average	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum	51.3%	36.6%	41.2%	38.8%	27.3%	17.9%	14.5%	12.3%	10.0%	8.9%	7.7%	5.1%	7.7%
Max3			39.3%	36.4%	23.6%	17.2%	14.1%	11.7%	9.7%	8.4%	7.1%	4.8%	7.4%
Deep Percolation/Ground Water Return Flows at Stream (lagged)													
Average	7.4	5.7	11.6	22.2	25.5	28.0	30.2	29.5	24.9	21.8	17.4	10.8	235.0
Total Return Flows at Stream													
Average	7.4	5.8	15.6	29.2	32.9	37.6	39.9	38.1	30.6	26.8	19.7	10.8	294.5
Historical Depletions at Stream from Farm Headgate Deliveries													
Average	-6.9	-5.0	25.4	43.2	43.7	62.6	61.1	50.9	28.5	24.8	4.6	-10.8	322.1
Maximum	-1.1	-0.2	54.6	81.1	69.2	80.1	85.3	84.3	54.5	42.9	23.1	-1.7	431.9
Max3	-2.1	-1.2	50.8	72.0	68.7	78.4	82.1	79.7	50.2	40.2	19.5	-3.1	409.1
Max10yr	-58.9	-42.6	333.6	581.9	508.1	676.1	681.4	608.8	406.3	317.9	73.1	-95.3	3736.6
Historical Depletions at Stream from River Diversions (Considering Off-Farm Canal Losses)													
Average	-11.8	-8.7	28.4	48.9	47.8	69.3	65.8	52.8	26.0	22.7	-1.0	-18.2	322.1
Maximum	-1.9	-1.5	63.6	93.3	79.0	92.1	94.0	91.6	54.0	42.2	22.6	-3.0	429.5
Max3	-4.0	-3.2	58.5	83.0	76.8	89.3	90.5	86.6	50.9	39.2	18.7	-5.4	410.6
Max10yr	-103.5	-77.1	381.1	665.9	548.8	744.1	734.0	642.1	395.4	297.8	20.0	-164.3	3741.1
On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery													
Depletions	2.3%	33.9%	47.7%	42.7%	51.0%	55.0%	55.0%	55.0%	55.0%	54.2%	50.1%		52.2%
TW Return	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%		9.7%
DP Returns	88.1%	56.4%	42.7%	47.6%	39.4%	35.4%	35.4%	35.4%	35.4%	36.2%	40.2%		38.1%
Stream Depletion and RF Factors: Average Monthly Depletions and Returns at Stream as a percent of Average Farm Headgate Delivery													
Notes: Factors are for use with permanent dry-up; Depl/RF Factors percent of monthly FHGD, Winter RF Factors percent of total annual FHGD													
Depletion Factors			62.0%	59.6%	57.1%	62.4%	60.5%	57.2%	48.2%	48.1%	19.1%		52.2%
Return Flow Factors			38.0%	40.4%	42.9%	37.6%	39.5%	42.8%	51.8%	51.9%	80.9%		47.8%
Winter RF	-0.6%	-0.4%										-0.9%	

Lease Fallow Tool LFTengine_v7 18-Sep-2019 11:24:18 c:\LFT\LFT_FarmData_CSU_Pilot_Project HWE.xlsm Groves

LFTparcels worksheet

Table 11 Summary - Summary Period Average and Maximum Values for Selected Variables

Farm Name or Parcel Designation: Mayhoffer

Summary Period: 1988 - 2017

Notes:

Period	Farm Shares	Farm Acres	App. Eff.	Alfalfa (%)	Grass (%)	Corn_Grn (%)	Corn_Sil (%)	Spr_Grn (%)	Sorghum (%)	Win_Wht (%)	Vegetable (%)	Beans (%)	Beets (%)
Average	35.0	32.1	0.55	46.58%	8.17%	22.89%	3.45%	0.90%	3.05%	8.82%	4.91%	1.23%	0.00%
Maximum	35.0	35.2	0.55	76.98%	20.80%	36.40%	10.37%	2.20%	18.32%	15.98%	9.31%	2.40%	0.00%
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)	(AF or %)
River Headgate Diversions													
Average	0.0	66.9	6358.4	11649.1	12338.1	15155.7	14522.4	12718.0	8962.0	8340.1	3930.2	0.0	94041.0
Farm Headgate Delivery													
Average	0.0	0.1	9.5	17.4	18.4	22.6	21.7	19.0	13.4	12.5	5.9	0.0	140.4
Maximum	0.0	2.4	21.1	26.4	25.9	29.1	31.0	31.8	23.7	20.3	10.0	0.0	193.9
Max3	0.0	1.0	17.5	26.2	24.4	28.3	29.1	27.4	21.5	19.1	9.6	0.0	187.4
Max10yr	0.0	3.0	124.3	220.9	211.7	245.3	255.8	226.8	176.3	146.1	67.5	0.0	1651.2
Farm Crop Potential Evapotranspiration													
Average	1.1	1.3	2.6	9.4	14.2	19.2	20.7	17.1	11.0	2.5	1.4	1.1	101.5
Farm Effective Precipitation													
Average	0.8	0.9	1.9	3.4	3.9	3.7	4.8	4.4	2.2	2.1	1.1	0.9	30.1
Farm Irrigation Water Requirement													
Average	0.5	0.6	1.0	6.2	10.4	15.5	15.8	12.7	8.8	1.2	0.6	0.5	73.8
Farm Crop Irrigation Requirement Met by Irrigation Water Applied or in Soil Moisture													
Average	0.3	0.4	0.9	5.5	9.1	13.7	13.3	10.3	7.2	0.9	0.5	0.3	62.3
Maximum	1.2	1.5	3.3	12.8	15.9	18.6	21.9	17.3	11.9	3.0	1.5	1.2	83.3
Max3	1.1	1.3	2.6	11.0	15.2	18.4	20.0	16.7	11.6	2.8	1.4	1.2	78.0
Max10yr	5.8	7.8	15.6	75.1	125.2	144.2	150.6	118.9	86.1	11.5	5.9	5.4	670.9
Total Return Flows at Farm													
Average	0.0	0.0	6.9	12.5	10.3	10.6	9.9	8.7	6.6	8.4	4.1	0.0	78.1
Tailwater/Surface Runoff Return Flows at Farm													
Average	0.0	0.0	0.9	1.7	1.8	2.2	2.1	1.8	1.3	1.2	0.6	0.0	13.5
Deep Percolation/Ground Water Return Flows at Farm (unlagged)													
Average	0.0	0.0	6.0	10.9	8.5	8.4	7.8	6.9	5.3	7.2	3.5	0.0	64.5
Historical Depletions at Farm													
Average	0.0	0.1	2.6	4.9	8.1	12.0	11.8	10.3	6.8	4.1	1.8	0.0	62.4
Maximum	0.0	1.3	5.5	9.7	12.9	16.0	17.1	17.5	11.0	11.2	5.5	0.0	82.6
Max3	0.0	0.5	5.0	9.0	12.8	15.4	16.0	15.1	10.5	9.3	5.3	0.0	77.3
Max10yr	0.0	1.6	32.2	59.6	107.7	125.5	136.2	122.3	82.4	62.6	27.3	0.0	671.1
Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased													
Average	0.0	0.0	2.6	5.6	5.8	5.7	5.3	4.8	3.9	4.4	3.0	1.1	3.3
Maximum	0.0	0.4	7.6	11.1	11.6	8.1	8.1	7.1	8.2	9.1	5.8	2.0	6.2
Max3	0.0	0.1	5.8	10.0	10.0	8.1	7.3	6.5	6.9	8.3	5.5	1.9	5.9
Delayed Return Flows Remaining to Stream as Percent of Cumulative Farm Headgate Deliveries													
Average	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum		15.0%	35.3%	28.3%	19.3%	10.9%	6.9%	5.7%	5.0%	5.1%	3.2%	1.1%	4.1%
Max3			34.6%	27.6%	18.5%	10.4%	6.8%	5.4%	4.7%	4.9%	3.1%	1.1%	3.4%
Deep Percolation/Ground Water Return Flows at Stream (lagged)													
Average	0.8	0.3	3.5	7.8	8.3	8.5	8.3	7.4	6.2	6.7	4.8	2.0	64.5
Total Return Flows at Stream													
Average	0.8	0.3	4.4	9.5	10.1	10.7	10.3	9.2	7.4	7.9	5.4	2.0	78.1
Historical Depletions at Stream from Farm Headgate Deliveries													
Average	-0.8	-0.2	5.1	7.9	8.3	11.9	11.3	9.8	5.9	4.6	0.5	-2.0	62.4
Maximum	0.0	1.3	8.8	13.2	14.8	17.3	17.4	17.6	11.0	12.1	5.5	0.0	82.1
Max3	0.0	0.5	8.2	12.8	14.1	15.9	15.8	15.0	10.5	9.3	4.9	-0.1	77.0
Max10yr	-6.4	0.1	60.3	93.7	115.1	129.4	130.8	117.6	77.5	64.7	19.3	-15.1	671.8
Historical Depletions at Stream from River Diversions (Considering Off-Farm Canal Losses)													
Average	-1.2	-0.2	6.1	9.2	9.0	12.5	11.4	9.5	5.2	4.2	-0.4	-2.9	62.4
Maximum	0.0	1.4	10.9	15.2	16.2	18.8	18.3	18.3	11.3	12.7	5.6	0.0	82.0
Max3	-0.1	0.5	10.0	14.8	15.4	17.4	16.8	15.4	10.3	9.2	4.6	-0.2	77.0
Max10yr	-9.3	-0.5	73.2	110.2	125.0	135.8	133.5	116.5	71.4	62.9	12.7	-22.7	671.8
On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery													
Depletions		55.0%	26.9%	27.9%	44.1%	53.1%	54.2%	54.0%	51.0%	32.9%	30.9%		44.4%
TW Returns		9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%		9.7%
DP Returns		35.4%	63.5%	62.4%	46.2%	37.3%	36.1%	36.3%	39.3%	57.5%	59.5%		45.9%
Stream Depletion and RF Factors: Average Monthly Depletions and Returns at Stream as a percent of Average Farm Headgate Delivery													
Notes: Factors are for use with permanent dry-up; Depl/RF Factors percent of monthly FHGD, Winter RF Factors percent of total annual FHGD													
Depletion Factors			53.7%	45.5%	45.3%	52.6%	52.3%	51.4%	44.4%	36.6%	7.9%		44.4%
Return Flow Factors			46.3%	54.5%	54.7%	47.4%	47.7%	48.6%	55.6%	63.4%	92.1%		55.6%
Winter RF	-0.3%	-0.1%										-0.7%	

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LFTparcels worksheet

Table 12
Monthly and Annual Maximum Consumptive Use Credits
(all values in acre-feet unless otherwise noted)

Farm	% of Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Diamond A	41.40%	0.0	0.0	58.4	93.3	128.8	189.9	192.8	196.2	125.9	88.1	61.6	0.0	816.0
Schweizer	15.35%	0.0	0.0	5.3	9.9	11.0	13.4	13.7	12.9	10.1	8.4	4.5	0.0	71.5
Mameda	60.61%	0.0	0.0	17.6	24.2	23.3	26.7	27.9	27.4	19.7	16.6	8.2	0.0	169.1
Groves	38.41%	0.0	0.0	14.3	22.0	23.3	26.7	27.9	27.4	19.7	16.6	8.3	0.0	157.2
Mayhoffer	100.00%	0.0	0.0	5.0	9.0	12.8	15.4	16.0	15.1	10.5	9.3	5.3	0.0	77.3

Column Explanations

1) Farms identified in the CS-U Pilot Project

2) Calculated as the number of fallowed shares by Pilot Project Shares in Table 4 of the Application for each subject farm.

3 & 4) Monthly maximum set to zero for limitation to the irrigation season of March 15th to November 15th.

5 to 13) Calculated as Column 2 multiplied by the Max 3 Historical Depletion at Farm section of the LFT analysis for each subject farm.

14) Monthly maximum set to zero for limitation to the irrigation season of March 15th to November 15th.

15) Calculated as Column 2 multiplied by the Max 3 Historical Depletion at Farm section of the LFT analysis for each subject farm.

Joint Conference Report for the Colorado Springs/Super Ditch Pilot Project

Submitted to the Colorado State Engineer's Office and the Colorado Water Conservation Board

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I. Background

This Joint Conference Report was prepared pursuant to the Criteria and Guidelines for Fallowing-Leasing Pilot Projects II.I (Criteria and Guidelines), adopted on November 19, 2013 and as amended on January 25, 2016 by the Colorado Water Conservation Board (CWCB). As provided for therein, a conference meeting was hosted by CWCB staff for discussions among the Applicants, the State Engineer, and owners of water rights or contract rights to water who filed comments on the Colorado Springs/Super Ditch Pilot Project Application. The conference meeting was held on November 6, 2019 in Pueblo, Colorado at the office of the Division Engineer for Water Division 2. Participants attending the conference committee meeting were:

1. Megan Gutwein for Lower Arkansas Valley Super Ditch Company, Inc. ("Super Ditch").
2. Craig Lis for Super Ditch.
3. Krystle Ervin for Super Ditch.
4. Gerry Knapp for Super Ditch.
5. Matt Montgomery for Colorado Springs Utilities ("CS-U").
6. Kalsoum Abbasi for CS-U.
7. Scott Lorenz for CS-U.
8. Bill Tyner for Colorado Division of Water Resources.
9. Tracy Kosloff for Colorado Division of Water Resources.
10. Kelley Thompson for Colorado Division of Water Resources.
11. Melissa Van der Poel for Colorado Division of Water Resources.
12. Lori Lest for Colorado Division of Water Resources.
13. Rachel Zancanella for Colorado Division of Water Resources.
14. Alex Funk for Colorado Water Conservation Board.
15. Mary Presecan for Five Rivers Cattle Feeding LLC, d/b/a Colorado Beef.
16. Richard Mehren for Lower Arkansas Water Management Association ("LAWMA").
17. Randy Hendrix for LAWMA.
18. Ayrton Hendrix for LAWMA.
19. Bob Krassa for Pueblo West Metropolitan District.
20. Jeffrey DeHerrera for Pueblo West Metropolitan District.
21. Steve Leonhardt for Southeastern Colorado Water Conservancy District ("Southeastern").
22. Garrett Markus for Southeastern.
23. Lee Miller for Southeastern.

The Colorado Springs/Super Ditch Pilot Project ("Pilot Project") proposes to use water available from certain shares in the Catlin Canal Company ("Subject Shares") for municipal use by CS-U in three out of ten years. The Pilot Project will operate over the ten-year period from March 15, 2020 through March 14, 2030.

On November 13, 2019, a draft of this Joint Conference Report was circulated to all Conference Participants, along with representatives from Tri-State Generation and Transmission Association, Inc., which provided comments on the initial Pilot Project proposal but did not submit comments on the application or attend the conference. The final version of the Joint Conference Report was circulated to all parties on November 20, 2019, which incorporated all comments provided to Applicants as of that time.

The Criteria and Guidelines provide that "within fifteen days of the conference, the pilot project applicants and owners of water rights or contract rights to water shall file a joint report with the CWCB and the State Engineer outlining any agreed-upon terms and conditions for the proposed pilot project, and explaining the reasons for failing to agree on any terms and conditions for the pilot project if the applicant and the owners fail to reach a full agreement at the conference."

II. Agreed-Upon Terms and Conditions

The participating parties agreed upon the following terms and conditions for the proposed Pilot Project:

1. All water used in the Pilot Project will be first delivered to the headgate of the Catlin Canal, and only lands irrigated under the Catlin Canal Company will be used in the leasing-fallowing operations of the Pilot Project. A plan year for the Pilot Project extends from March 15 through March 14 of the following year ("Plan Year"). Project duration is from March 15, 2020 through March 14, 2030.

2. No lands shall be fallowed for more than three years during the ten-year period of the Pilot Project.

3. All submittals by Applicants to the Division of Water Resources pursuant to these Terms and Conditions shall be posted to the Division of Water Resources website, ftp site or other publically available media within a reasonable time, not to exceed ten days, after submittal and shall remain publically available until all lagged return flow obligations from the Pilot Project have been replaced. The Division of Water Resources shall establish a notification list which provides notice to subscribers when documents have posted.

4. By March 1 of each Plan Year for the Pilot Project, Super Ditch shall notify and provide mapping to the Division Engineer ***and all commenting parties*** of those parcels to be fallowed and the associated shares for the upcoming Plan Year. Lands and shares available and approved for fallow through operation of the

Pilot Project are limited to those identified in the Pilot Project application and as approved by the State.

[Applicants do not believe that all information needs to be provided to all commenting parties. This information is required to be posted online by Term and Condition No. 3. LAWMA requests that the italicized language be added.]

5. The Applicants have agreed to modify the consumptive use analysis to reflect a 30-year study period that does not include years when the parcels were dried up for augmentation credits in well association Rule 14 plans. All volumetric limits will be based on the revised study periods. In addition, Applicants have agreed to use the 1985 acreage agreed to by Colorado and Kansas.

6. The following monthly factors will be used to calculate monthly composite consumptive use factors, which will be applied to augmentation station deliveries to determine monthly consumptive use. The monthly composite consumptive use factors will be calculated as the sum of monthly consumptive use for each farm multiplied by the fallowed shares for each farm, divided by the total number of fallowed shares. The calculation of monthly composite consumptive use factors will be performed for each month from March through November. The monthly composite consumptive use factors will be determined in a separate analysis limited to the beginning of the Winter Water Storage Program to the last year before the parcels were dried-up for augmentation credits in a Rule 14 Plan. If no parcels were dried up for augmentation credits in a Rule 14 Plan then the 30-year period identified in the Application will be utilized to determine the monthly factors for that farm.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Diamond A	-	-	0.042	0.126	0.282	0.493	0.495	0.497	0.352	0.151	0.044	-
Schweizer	-	-	0.051	0.151	0.367	0.525	0.529	0.534	0.454	0.263	0.197	-
Mameda	-	-	0.521	0.419	0.498	0.550	0.550	0.550	0.550	0.550	0.550	-
Groves	-	-	0.228	0.286	0.427	0.537	0.550	0.550	0.523	0.401	0.345	-
Mayhoffer	-	-	0.058	0.152	0.370	0.526	0.531	0.535	0.450	0.271	0.212	-

7. The portion of available Pilot Project augmentation station headgate delivery that is not credited as consumptive use will first be allocated to irrigation season tailwater and irrigation season lagged deep percolation return flow maintenance. The remaining available Pilot Project augmentation station headgate delivery will be available for exchange to Pueblo Reservoir into the Lower Arkansas Valley Water Conservancy District's ("LAVWCD") account pursuant and consistent with to LAVWCD's subcontract with Southeastern, or any other storage account for which Applicants obtain all necessary approvals, including, but not limited to, approval by Southeastern of any assignment, for all approved uses by the City of Colorado Springs. CS-U shall dedicate reusable

water from any of its available sources to replace all lagged return flows in any given year. The available Pilot Project augmentation station headgate delivery will be calculated as the farm headgate delivery minus lateral loss of 3.5% and consumptive use. Consumptive use is calculated as the available Pilot Project augmentation station headgate delivery, calculated as described above, multiplied by the composite consumptive use factor. Return flows are equal to the available Pilot Project augmentation station headgate delivery, calculated as described above, minus the consumptive use. Tailwater return flow is the return flow multiplied by 20%, and deep percolation return flow is the return flow multiplied by 80%.

8. The monthly and annual consumptive use will be limited to the following maximum values which are the averages of the three greatest months for each month and three greatest years of the study period, consistent with the Criteria and Guidelines. The values in the table will be multiplied by the ratio of the number of shares fallowed for each farm during a Plan Year divided by the total number of shares included in the Pilot Project for each farm, (not including shares leased from the Colorado Division of Parks and Wildlife (CPW) since the consumptive use for CPW shares is not included in the below table). In addition, the Pilot Project will deliver no more than 1,000 acre-feet of consumptive use credits to CS-U in Pueblo Reservoir under the Pilot Project in any given Plan Year (Contract Limit***), unless the water has been moved using a stepped exchange to an intermediate location and Colorado Springs accepts delivery of such water in a year following its initial exchange***. Once any of the monthly or annual volumetric limits (including the Contract Limit), has been met, all water available to the Subject Shares will be delivered through the augmentation stations on the Catlin Canal with no further claim of consumptive use credits or any other use until such time as use of the Subject Shares by Applicants is again allowed in accordance with the volumetric limits of this approval.

[Applicants believe the italicized language above is necessary and appropriate to beneficially use water that has been exchanged into storage, but not to Pueblo Reservoir in the same year. It appears that LAWMA is ok with this operation, based on the revisions to the next paragraph. The contract limitation of 1,000 af is a limit on the amount actually delivered to Pueblo Reservoir.

LAWMA requested that this language be removed.]

Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Diamond A	0.0	0.0	141.6	178.8	264.3	455.0	456.6	474.3	272.9	212.5	149.5	0.0	1879.7
Schweizer	0.0	0.0	13.7	34.8	61.5	86.6	84.3	84.2	56.0	55.7	28.7	0.0	369.7
Mameda	0.0	0.0	25.6	35.8	37.5	44.3	46.3	45.5	32.6	27.5	13.6	0.0	261.1
Groves	0.0	0.0	30.9	50.5	55.4	73.8	76.7	72.2	53.4	38.2	20.8	0.0	347.2
Mayhoffer	0.0	0.0	2.7	6.2	11.2	15.5	15.0	15.0	10.0	10.0	5.3	0.0	67.1

9. Up to 1,000 acre-feet/year of consumptive use water (Contract Limit) generated during each Plan Year of fallowing operations may be exchanged to Pueblo Reservoir for delivery to CS-U during each of the three Plan Years of fallowing operations. Any of the 1,000 acre-feet/year of consumptive use water not exchanged to Pueblo Reservoir during a plan year of fallowing operations because of insufficient exchange potential to Pueblo Reservoir, that is instead delivered to storage in a reservoir other than Pueblo Reservoir ("Remaining Consumptive Use Water"), may be exchanged to Pueblo Reservoir for delivery to Colorado Springs in a subsequent year. Remaining Consumptive Use Water shall count against the Contract Limit in the year in which it was first delivered to storage in a reservoir other than Pueblo Reservoir and not against the Contract Limit for the year in which Remaining Consumptive Use Water is exchanged to Pueblo Reservoir for delivery to CS-U. In addition, no more than 3,000 acre-feet of consumptive use water generated in three Plan Years of operations will be exchanged to Pueblo Reservoir for delivery to Colorado Springs during the term of the Pilot Project, though consumptive use water delivered to storage in a reservoir other than Pueblo Reservoir may be later exchanged to Pueblo Reservoir during years when fallowing does not occur. All consumptive use water not delivered to CS-U by the conclusion of the Pilot Project will be returned to the Arkansas River with no claim of consumptive use credits or any other use.

10. Deep percolation return flows for the Diamond A, Schweizer, Mameda, Groves, and Mayhoffer Farms will be lagged using the URFs attached in Appendix G, subject to revisions to the URFs as ordered by the Division Engineer's Office. Return flows will be maintained via release of supplies available to CS-U listed in [Table 9] or other fully consumable sources available to CS-U for replacement of return flows. Transit losses will be assessed from the point of release to the confluence of the Arkansas River and/or Crooked Arroyo based on the augmentation station(s) in use for the Pilot Project.

11. Due to the potential for a canal induced high water table adjacent to the Schweizer Farm, and noting the potential for a steep gradient of the water table relative to the grade of the surface topography during the irrigation season, the planting of a cover crop during the irrigation season is prohibited on the following Parcel IDs: 21721558 (NW Parcel), the west half of 2172376

(Pivot Parcel), 21723382 & 21711491 (South Parcels), and these parcels must be left in stubble or deep tilled during the irrigation season. Planting of a winter or spring cover crop is permissible during the remainder of the year to minimize the potential for erosion and/or blowing soils.

12. Fallowed parcels must be at least ten acres in size unless they comprise all of an existing CDSS parcel that is already less than ten acres. Parcels that represent a portion of an existing field can only be split in the same direction of historic irrigation unless a means of physical separation is approved by the CWCB based on the written determination of the State Engineer. A physical separation must exist between any irrigated portion of a parcel and the dry-up portion. For dry-up fields left fallow or with a dry-land cover crop without permanent root system (that is, not alfalfa or pasture grass for example), the separation can be a ditch or tilled strip at least ten feet in width that prevents irrigation application from reaching the dry-up parcel. For partial fields containing deep-rooted crops such as alfalfa or pasture grass, a deep tilled separation of at least 25 feet must be maintained along with any ditches necessary to ensure no irrigation application to the dry-up portion. For any dry-up parcel that is planted with a dry-land crop (haygrazer, milo, millet, etc.), the crop should either be drilled at an angle to normal irrigation direction or a tilled strip maintained at the top of the field that clearly separates the crop from any possible irrigation source or both.

13. Dry-up of the fallowed fields will comply with the "Operating Procedures for Administration of Parcels Claimed for Augmentation Credits" of the Colorado State Engineer's Office. Re-irrigation of dry-up parcels with any source of water, including groundwater, shall not be allowed during the Plan Year in which such parcel is fallowed in Pilot Project operations. No partial year dry-up shall be permitted.

14. Super Ditch will notify the Division Engineer of the status (dry land crop (must specify type), tilled and fallow, not tilled and fallow, stubble of past crop left on field, etc.) of each fallowed field in the Pilot Project by April 15 of each year of operations.

15. Super Ditch shall monitor fallowed parcels on a periodic basis to confirm the adequacy of dry-up in conformance with the terms and conditions of this approval. Should noncompliance with the dry-up requirements be discovered, Super Ditch shall immediately notify the Division Engineer in writing and take such corrective action as is required by the Division Engineer. Fallowed parcels shall be subject to inspection by the Division Engineer who shall inform the pilot project sponsor if noncompliance is found.

16. Prior to any Pilot Project operations, Super Ditch will ensure that all participating farmers are contractually bound to provide for weed control and

erosion protection for the lands removed from irrigation as a part of the Pilot Project. This will include the acknowledgement of, and agreement to comply with applicable County code noxious weed management requirements, including the Otero County Noxious Weed Management Plan, Otero County Code, Chapter 12 – Vegetation. ***Weed control and erosion protection must be accomplished in a manner that does not include the tillage of the soil that would result in the potential increase in loss of soil moisture.***

[*LAWMA has requested additional terms and conditions related to the italicized language that are included in the Unresolved Terms and Conditions section. Applicants believe this language should not be included.]*

17. Tailwater return flow obligations shall be calculated daily and shall be replaced by delivery of the Subject Shares at the augmentation station(s). Applicants shall endeavor to replace the daily calculated amount of tailwater return flow obligation on a daily basis. Applicants shall demonstrate that all monthly tailwater return flow obligations have been replaced each month.

18. Lagged deep percolation return flow obligations shall be calculated daily and shall be replaced exclusively through: (a) delivery of the Pilot Project Catlin Canal shares at the augmentation station(s) and/or (b) other sources of water decreed for augmentation or replacement or approved for augmentation or replacement by a C.R.S. 37-92-308(4) SWSP. From March 15 through November 14 return flows will generally be replaced with deliveries to the augmentation station, though other approved sources as described herein may be used for such replacement. During the irrigation season, on a monthly basis, Applicants shall demonstrate that all lagged deep percolation return flow obligations have been replaced. During November 15 to March 14, replacement of lagged deep percolation return flow obligations may be aggregated as approved by the Division Engineer in accordance with Exhibit M of the decree in Case No. 12CW94 so long as there is no injury to the Winter Water Storage Program, Colorado water rights, Conservation Storage in John Martin Reservoir or the Kansas-Colorado Arkansas River Compact. When the Catlin Canal is diverting water, return flows will generally be replaced with deliveries to the augmentation station, though other approved sources as described herein may be used for such replacement. When the Catlin Canal is not diverting water, return flows will be replaced with sources available to CS-U as described herein.

19. The amount of consumptive use credits and return flow obligations and the disposition of consumptive use credit and return flow replacement water shall be calculated on a daily basis. Such consumptive use credits may be exchanged to Pueblo Reservoir for use by CS-U or to replace Catlin Pilot Project return flows as necessary, or step exchanged to storage for such uses. Water allocated to replace deep percolation return flows and delivered through Catlin

Canal augmentation stations that is in excess of the replacement requirement on a given day will be allocated as a stream depletion credit. However, such use of deep percolation return flow water as a stream credit will result in a future replacement obligation that will require dedication of a firm source of return flow replacement water in the projection of lagged deep percolation return flow obligations. Such depletion credits may be exchanged to Pueblo Reservoir for use by CS-U or to replace Catlin Pilot Project return flows as necessary, or step exchanged to storage for such uses.

20. Any excess consumptive use credits available from Pilot Project operations shall not be claimed for use as a source of replacement water for agricultural irrigation depletions in any Rule 14 Plan or substitute water supply plan.

21. Calculations of return flows owed to the river must be updated as needed (at least monthly), based on actual past water availability and estimated future availability. If there is an under delivery of return flow water in any month this under delivery shall be made up in the subsequent month.

22. Exchange into Pueblo Reservoir may occur only when there is at least 100 cfs of outflow (inclusive of hatchery flows) from Pueblo Reservoir. Such diversions/exchanges may not cause the outflow from Pueblo Reservoir to be less than 100 cfs. In addition, exchanges will be operated as junior to the City of Pueblo's recreational in-channel diversion water right awarded in Case No. 01CW160, and as though the right is in effect 24 hours per day. Operations of this Pilot Project shall comply with the requirements of the Arkansas River Flow Management Program (the "FMP") established pursuant to the May 2004 Regional Intergovernmental Agreement among Pueblo, the City of Aurora, Colorado, acting by and through its Utility Enterpise, Southeastern, Fountain, CS-U, and Pueblo Water (the "IGA"), to the same extent that CS-U and Southeastern are required to comply with the FMP, which may result in additional limitations on the exchange of water into Pueblo Reservoir. Notwithstanding the foregoing, this term and condition does not require Super Ditch to comply with any terms and conditions in the IGA that are not specifically listed in the FMP.

23. No exchange will be operated under this Pilot Project past the Avondale gauge when flows at the USGS Gauge at Avondale are, or to the extent such exchanges will cause such flows at the Avondale Gauge to be, less than 500 cfs.

24. Any exchange of water as a part of this Pilot Project must be approved in advance by the Division Engineer after a determination that there is sufficient exchange potential to accomplish the requested exchange without injury to other water rights. Applicants must request to make an exchange through the Arkansas River Dashboard. If the Dashboard is not functioning properly,

Applicant must request to make an exchange by providing a written request to the Division Engineer's Office for Water Division No. 2.

25. Exchanges operated under the decree for Case No. 10CW04 will comply with all terms and conditions decreed therein. Any exchange operated in connection with this Pilot Project under Administrative Approval will comply with all relevant terms and conditions for the Pilot Project. No exchanges into Pueblo Reservoir will be operated under the exchanges decreed in Case No. 05CW96 under this Pilot Project.

[Applicants believe that all exchanges do not need to comply with 10CW4, and in fact likely cannot comply with 10CW4. However, those exchanges that are operated under 10CW4 will comply with those terms and conditions and all others will be approved administratively.

LAWMA requested that all exchanges comply with 10CW4.]

26. Applicants may operate an exchange only if there is a continuous live stream between the downstream exchange-from point and the upstream exchange-to point, and must cease operating at any time that a live stream ceases to exist in that reach.

27. The rate and volume of water diverted at the exchange-to point or stepped exchange points shall not be greater than the rate and volume of water introduced at the exchange-from point, after adjustment as necessary to account for losses (including but not limited to transit losses, seepage losses, evaporation, and evapotranspiration).

28. The rate of exchange shall be limited to the least of (1) the rate at which substitute supplies are delivered at the exchange-from point, (2) the rate at which the exchange is in priority within the relevant exchange reach, (3) the minimum rate of flow in the exchange reach that will preserve a live stream, (4) the amount of flow available at the exchange-to point, and (5) the physical capacity of the receiving structure at the exchange-to point that is legally available to Applicants.

29. Stored water derived from the Colorado Springs/Super Ditch Pilot Project and/or fully consumable sources available to CS-U will be used to meet the lagged historical return flow obligations associated with the fallowing of the historically irrigated lands. Transit losses on water delivered for replacement of the lagged historical return flow obligations as assessed by Division 2 will be included from the point of release to the confluence of the Arkansas River and Crooked Arroyo or Timpas Creek, as applicable. Lagged historical return flow releases will generally be made from Lake Meredith but may also be made from

Pueblo Reservoir, or by utilizing CS-U's fully reusable return flows available at the mouth of Fountain Creek.

30. Any return flows not met by proper delivery of that portion of the available headgate diversions shall be made up from some other source decreed for this use or approved for this use by a substitute water supply plan. Absent prior approval by the Division Engineer of some other source, it will be assumed those losses will be made up from the consumptive yield of shares included in the Pilot Project and CS-U's replacement sources.

31. All diversions shall be measured in a manner acceptable to the Division Engineer. Super Ditch shall install and maintain measuring devices as required by the Division Engineer for operation of the Pilot Project.

32. Accounting of water in this Pilot Project must be provided to the Division Engineer on forms and at times acceptable to him. Said accounting must be received by the 10th of the month following the month being reported. The name, mailing address and phone number of the contact person who is responsible for operation and accounting of this plan must be provided on the accounting forms.

33. The accounting will use the tables listed in Appendices B through G of this document as the tool for comparing historical use analyses with projected operations as a pilot project.

34. The name, e-mail and postal addresses, and phone number of the contact person who will be responsible for the operation and accounting of the Pilot Project must be provided with the accounting forms to the Division Engineer and Water Commissioner.

35. Pueblo Reservoir, Twin Lakes Reservoir and Fountain Valley Pipeline (or Conduit) are owned and operated as part of the Fryingpan-Arkansas Project by the United States Department of the Interior, Bureau of Reclamation. Applicants shall store water in Pueblo Reservoir only so long as they have a contract with the owners of that structure, and such storage and use is within the effective time period of such contract. Any use of Fryingpan-Arkansas Project facilities by Applicants, for storage, exchange or otherwise, will occur only with the written permission of the owner of said reservoir, and will be made consistent with such policies, procedures, contracts, charges, and terms as may lawfully be determined by the U.S. Bureau of Reclamation or its successors in interest, in their good faith discretion. Any approval of the Pilot Project will not give Applicants any rights to use of Fryingpan-Arkansas Project structures, including Pueblo Reservoir, but will not alter any existing rights Applicants may have of any use of the Fryingpan-Arkansas Project facilities. Applicants shall not operate the Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project. Applicants will

operate the Pilot Project in a manner consistent with the LAVWCD's subcontract with Southeastern for excess capacity storage in Pueblo Reservoir. Prior to storing water in Pueblo Reservoir pursuant to a subcontract between Southeastern and LAVWCD, or any other excess capacity storage participant, Applicants shall obtain an assignment of all or any appropriate portion of that subcontract, approval of which will not be unreasonably withheld by Southeastern.

36. Applicants acknowledge that any Pilot Project approval does not give Applicants any rights to ownership or use of any Fryingpan-Arkansas Project structure, or any rights of ownership or rights to purchase or receive allocation of Fryingpan-Arkansas Project water, and does not alter any existing rights (including any right to renew existing contracts) Applicants may have. Applicants shall not use Fryingpan-Arkansas Project water or Project Water return flows for maintenance of return flows from irrigation use of any water rights utilized in this Pilot Project.

37. Applicants shall not operate the Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project. Any water stored in Pueblo Reservoir as a part of this Pilot Project shall be beneficially used within Southeastern's district boundaries.

38. Use of Winter Water to meet return flow obligations from the fallowing of historically irrigated lands shall be consistent with the terms and conditions contained in the Winter Water Storage Program ("WWSP") decreed in Case No. 84CW179 (Water Div. 2) and Southeastern's contract for Winter Water storage in Pueblo Reservoir. Applicants' Winter Water shall be delivered through the Catlin Canal during the period of March 15 through November 14 at the same time as deliveries of Winter Water Storage are made to other Catlin Canal shareholders. Applicants shall not operate exchanges under this Pilot Project during the Winter Water Storage Program storage season of November 15 through March 14. Nothing in any approval of this Pilot Project authorizes storage of Winter Water contrary to the requirements and limitations of the Decree in Case No. 84CW179 and the contract between the United States and Southeastern Colorado Water Conservancy District.

39. A portion of the water available to the Subject Shares is derived from the Catlin Canal Company's share of water stored pursuant to the decree dated November 10, 1990 in Case No. 84CW179 ("Winter Water") in Pueblo Reservoir. During operation of the Pilot Project the portion of the Winter Water available to the Subject Shares shall be stored in Lower Arkansas Valley Water Conservancy District's excess capacity space in Pueblo Reservoir, or such other storage space that Applicants obtain all necessary approvals to utilize, and must be released to the Catlin Canal during the period of March 15 through November 14 in proportion to release of Catlin's other Winter Water and may

not be booked- over to CS-U or used for replacement of winter return flows. If no excess capacity storage is available in a given year, Applicants will not have Winter Water available in Pueblo Reservoir for this Pilot Project during that year.

40. All of Applicants' Winter Water shall be delivered through the Catlin Canal during the period of March 16 through November 14, at the same time as deliveries of Winter Water are made to Catlin shareholders. Any Winter Water stored in Pueblo Reservoir under this Pilot Project will be stored pursuant to the applicable rules and regulations in effect from time to time for storage of Winter Water.

41. To the extent that the Pilot Project stores the net depletion amount of the participating shares in Pueblo Reservoir, such water may be booked over to replace return flow obligations that are owed to Winter Water Storage Program participant structures during the Winter Water storage period on a monthly or weekly basis, or as otherwise required by the Division Engineer, to participants in the Winter Water Storage Program as necessary to prevent injury to the water rights included in that Program. The Division Engineer will utilize Exhibit M of the decree in Case No. 12CW94 to determine the amount of the return flow obligation that is owed to John Martin Reservoir. The Division Engineer will be required to make Winter Water releases from Pueblo Reservoir or other reservoirs upstream from John Martin Reservoir to deliver Winter Water to John Martin Reservoir, or to water users downstream of the confluence of the Arkansas River and Timpas Cree. Applicants will pay the assessed transit loss for delivery of such water to the confluence of the Arkansas River and Timpas Creek, up to the full amount of the non-irrigation season return flow obligation owed by Applicants for the applicable non-irrigation season.

42. Prior to operation of the Pilot Project, Applicants shall provide proof to the Division Engineer ***and the commenting parties*** that all agreements and approvals necessary for the operation of the Pilot Project have been obtained.

[Applicants do not believe that all information needs to be provided to all commenting parties. This information is required to be posted online by Term and Condition No. 3. LAWMA requests that the italicized language be added.]

43. Prior to March 1 of each Plan Year, Applicants shall prepare and submit to the Division Engineer a monthly projection for the replacement of surface and lagged return flow obligations owed for deliveries to date and projected for the upcoming Plan Year and for total future monthly obligations over the lagged return flow period. This projection shall be available to all interested parties through the posting to an FTP site or other accessible website within ***[a reasonable time] [14 days]*** of submittal to the Division Engineer.

[Applicants do not believe it is appropriate to bind the Division Engineer's office to a time limit for posting information. LAWMA believes it should be 14 days.]

44. Applicants shall annually prepare a report of Pilot Project operations on or before January 15 of the year following each of the three years that the Pilot Project is operated to deliver water to CS-U for municipal use. Such report must be submitted to the CWCB and the State and Division Engineers, and will reflect a reporting year of November 16 of the prior Plan Year through November 15 of the current Plan Year for which the report is being prepared. This annual report will present: (a) a summary of Plan Year accounting, including the total amount of acres and Subject Shares fallowed, Plan Year deliveries to the Subject Shares, HCU credits generated, water exchanged to Pueblo Reservoir for use by Colorado Springs, tail water return flow obligation replaced and unreplaced, lagged return flow obligation replaced and unreplaced, sources of water used to meet lagged return flow obligation, future lagged return flow obligation and firm yield source of water that will be used to meet lagged return flow obligation; (b) any accounting errors or deficiencies discovered during the Plan Year and any accounting modifications that were made during the Plan Year or are proposed to be made for the upcoming year; (c) the number of days, if any, when there were unreplaced return flow obligations; (d) efficacy of the LFT, temporary dry-up, prevention of erosion, blowing soils, and noxious weeds and re-irrigation of temporarily fallowed lands ***the following year, which will include a water budget analysis***; (e) information regarding the parcels that have been dried up to date and years of such dry up to demonstrate that the limitations contained in term and condition 2 have not been exceeded; (f) a summary of costs associated with Pilot Project operations, including lease payments made/received, operational costs, and to the extent available costs of erosion prevention and noxious weed management; (g) identification of any obstacles encountered in Pilot Project operations; (h) any additional terms and conditions that Applicants believe may be necessary to prevent future material injury to other water rights or contract rights to water; and (i) any proposed minor operations for the upcoming Plan Year. Any proposed operational modifications shall be accompanied by such information and analysis as is necessary for the State and Division Engineer and any interested parties to evaluate the potential for injury resulting from such proposed changes. Applicants shall submit to the CWCB and the State and Division Engineers a brief status report stating that the Pilot Project was not operated on or before January 15 of the year following each of the years that the Pilot Project was not operated over the ten-year period of the project. Reports submitted pursuant to this term and condition shall be posted on the CWCB website.

[LAWMA requested addition of the italicized language, which is related to a disputed term and condition below.]

45. All parcels nominated in the Pilot Project may not be dried up for use in any Rule 14 plan, ***[Rule 10 plan, augmentation plan,]*** or substitute water supply plan, interruptible water supply agreement, or another pilot project for the 10 years of operation of the Pilot Project.

[As drafted, this term and condition complies with the Guidelines. LAWMA requested that the additional italicized language be added].

III. Unresolved Terms and Conditions

The participating parties were not able to reach agreement regarding terms and conditions on the following topics or subject areas:

1. Whether or not Applicants must deliver to the Arkansas River an amount of water equal to the difference in soil moisture before and after a parcel was dry-land farmed.

A. Applicants' Position: Applicants believe that the conservative nature of the LFT will more than make up for any additional irrigation water that will be applied to a field after it is dry-land farmed. In other words, the LFT underestimates HCU credits, so Applicants will be over-replacing water to the river when they are operating the Pilot Project. According to the Division Engineer's Office, the soil moisture issue was considered when the Criteria and Guidelines were drafted, and the parties creating the Guidelines concluded that no rules regarding soil moisture were required due to the conservative nature of the LFT. Moreover, in this Pilot Project, land will only be fallowed or dry-land farmed for up to three years, rendering this term and condition even more unnecessary. Super Ditch has completed an analysis comparing soil moisture losses, for three consecutive years, for conditions with and without a cover crop, which simulates storage recovery after a drought period. The analysis confirms that the LFT analysis using the Senate Bill 1248 criteria provides for total return flows that exceed the additional soil moisture losses resulting from the three years of fallowing, which supports the conclusions made during the development of the Guidelines.

B. LAWMA's Position: LAWMA believes that water within the soil moisture profile will be depleted when a fallowed parcel of land is dry-land farmed and that this depletion will cause the Catlin Canal to divert additional water during the next irrigation year to replace the depleted soil moisture reservoir on the dry-land farmed parcel resulting in injury to Arkansas River water rights. The Applicants' assertion that because the LFT is conservative such that Applicants' use of the LFT will result in downstream water rights receiving more water during fallowing operations does not address the potential for injury to other water rights during the following year when irrigation takes place. LAWMA has identified that the depletion of the soil moisture reservoir due to dry-land farming of a parcel during a fallow year could be up to 116 acre-feet in a single year if all of the land dried-up is dryland farmed

with winter wheat (1994). This is a result of winter wheat consuming the water within the soil profile from March to June at a monthly PET amount determined by Dale Straw of the SEO in 2011 for the Rocky Ford climate station and the lower effective monthly precipitation amounts for the year.

LAWMA doesn't believe that a potential 116 acre-foot depletion amount is insignificant and, therefore, LAWMA recommends that if any parcel is dry-land farmed or is tilled in a manner that could increase the loss of soil moisture to control soil erosion, then Super Ditch should provide a water budget analysis that establishes the end of the year soil moisture volume prior to dry-up and after dry-up. If this analysis shows that the soil moisture volume has decreased, then this depletion amount should be replaced by Applicants as a return flow obligation during the upcoming year.

C. Pueblo West's Position: The effect of alternating a parcel between fallowed and irrigated require further study to determine whether such a practice would increase the actual consumptive use on those parcels for years when they are being irrigated. If during the 10 year project, they switched back and forth every year from irrigation to fallow, in the five years when the parcel was being irrigated it would consume more water than during the historical average year, and so if Super Ditch got the average credit for the five years of fallow, the total for the 10 years would be too high. The solution would be to reduce the credit for years of fallow so that the ten year average would be protected.

2. Whether lagged deep percolation factors should be calculated according to the Criteria and Guidelines, or according to the analysis in Case No. 12CW94.

A. Applicants' Position: Applicants believe that it is appropriate to utilize the process outlined in the Criteria and Guidelines to calculate lagged deep percolation factors. The purpose of the Criteria and Guidelines, LFT, and pilot project program in general is to streamline leasing and fallowing projects to make them less onerous and undesirable for participants. The purpose of HB 1248 pilot projects is also to test the streamlined process to determine if it is viable. In order to test this aspect, Applicants need to use the process in the Criteria and Guidelines to determine these factors. Specifically, the Criteria and Guidelines state

> Section II.G. includes methodologies and approaches, assumptions, and presumptive factors that provide for a streamlined application, review, and approval of the pilot projects. The Board has adopted these methodologies, approaches, and assumptions in this Criteria and Guidelines document, with public participation, to streamline the process for pilot project application development, review, and approval. The Board's intent is that the good faith adherence to these Criteria and Guidelines by applicants, any parties filing comments on pilot project applications, the State Engineer, and the Board will assist the Board's approval process and will reduce or eliminate the need for appeal on the technical bases outlined in this document. Section II.M.

Unlike ditch losses, which the Criteria and Guidelines state may be obtained from a previous change case, deep percolation factors are supposed to be determined using a consistent process. See Section II.G.2.a.ii.2.

B. LAWMA's position: The Criteria and Guidelines do establish general methodologies, approaches, and assumptions to streamline the process but do not prohibit the use of methodologies, approaches, and assumptions that have been peer reviewed through the water court process and included in a decree of the water court for the very same lands included in this Pilot Project. In fact, LAWMA accepted the Applicants' lagging methodology for those farms that are included in the Pilot Project but that were not included in the Catlin Augmentation Associations' decree in Case No. 12CW94, with some suggested revisions to the lagging analysis (see below). LAWMA believes that acceptance of already decreed lagging procedures for the same farms would not be considered controversial especially as LAWMA and Super Ditch's experts were both parties to Case No. 12CW94.

3. Whether the Applicant should revise the URFs for the Schweizer Farm based on an alternative drain location.

A. Applicants' Position: Patterson Hollow is mapped in Otero County USGS Topographic maps as going through the middle of the Schweizer Farm (the drain is channeled through a culvert under the county road). Additionally, the drain can be identified from aerials in the middle of the Schweizer Farm. The drain was also mapped as a stream crossing the Schweizer Farm in Figures 1 and 4, as well as a groundwater drain in Figure 4, of the engineering report in support of 12CW94 dated September 2, 2019. The point identified as the point of accrual on Patterson Hollow for the Schweizer Farm was identified to be consistent with the Criteria and Guidelines as extending from the centroid of the farm to a point perpendicular to the drain.

B. LAWMA's position: LAWMA does not dispute that it is appropriate to lag the deep percolation return flows from the Schweizer Farm to the Patterson Hollow. However, Applicant's Figures, 6, 7, 9 and 23 show a parcel identified as potential dry-up parcel as the point to where the deep percolation return flows were lagged to by the Applicants. The potential dry-up parcel where the deep percolation return flows are lagged to can't be considered dry if there is a live stream running through the Patterson Hollow. This parcel would have to be modified by reducing the size of the parcel by removing Patterson Hollow from within the parcel. LAWMA's suggestion was a minor adjustment to lag the deep percolation return flows to the point of connection with the Patterson Hollow on the east side of the road and would not significantly alter the URF timing.

4. Whether the Applicants should use the URFs developed for the Mameda Farm in Case No. 12CW94.

A. Applicants' Position: Applicant's respond that the Criteria and Guidelines provide specific guidance on the method by which URF's should be calculated; therefore, it is not appropriate to use URFs included in Case No. 12CW94 that were calculated using a method that differs from those established in the Criteria and Guidelines. For example, the

Criteria and Guidelines require a specific yield of 0.2 which is inconsistent with values used in 12CW94. Also, to simply lagging the URFs in 12CW94 were developed using "sectors"1 rather than the farm specific URFs required by the Criteria and Guidelines. Efforts were made to maintain consistency with 12CW94 when the Criteria and Guidelines allowed. The spoil bank ditch identified in 12CW94 was used as the point of accrual for the Mameda Farm which is consistent with 12CW94. Table 26 of the engineering report in support of 12CW94 lists a drain ditch as the point of accrual for return flows in sectors 7 and 8 which contain the Mameda Farm.

B. LAWMA's position: Exhibit H of the decree in Case No. 12CW94 has unit response functions for the Mameda Farm. It is LAWMA's position that this URF should be used for the Mameda Farm. If the Applicants are using specific components of the lagging analysis in Case No. 12CW94 such as the spoil bank then they should use the end results. As it appears now the Applicants are "cherry picking" data from the engineering analysis in Case No. 12CW94 but only if it benefits them and not choosing the end result.

5. Whether or not detailed terms and conditions related to controlling erosion and noxious weeds are necessary.

A. Applicants' Position: Applicants believe that it is unnecessary and overly burdensome to include more detailed terms and conditions related to erosion and noxious weeds than are already included in Term and Condition #12 above, and in the existing contracts with farmers for several reasons. First, the Criteria and Guidelines, which are intended to streamline the process for temporary fallowing leasing projects, do not require more detailed and burdensome conditions related to this issue. Second, Term and Condition #12 is the same as the term and condition related to weeds and erosion that was approved in the Catlin Pilot Project. Four years of operations of the Catlin Pilot Project have shown that participating farmers are in fact controlling weeds and erosion. Third, the contracts with the farmers, which were circulated to all parties following the conference, include more detailed requirements for participants to control weeds and erosion. Fourth, Applicants are already required to submit an annual report that includes information about weed and erosion control. Finally, the Pilot Project contemplates temporarily fallowing or dry-land farming parcels and leasing consumptive use credits for municipal use in only three out of ten years. This project will not permanently dry up land, and will not likely dry up land for more than one or two years at a time. Thus, the concerns regarding weeds and erosion are much less than these concerns in a change of water rights case that contemplates permanent dry-up.

B. LAWMA's position: There are no standards established in Term and Condition No. 14 that specify how weed control and erosion protection will be accomplished. The Applicants assert that this has been included in the individual farmer's contracts with Super Ditch. The terms and conditions for any approval of the Pilot Project should include the terms and conditions identified in the contracts with the exception of the Open Fields. The Open Fields section (Paragraph 11.c) states that to control blowing dust the measures may

[1] See Figures 4, 5 and 6 of the engineering report in support of 12CW94.

include furrowing or chiseling the fields. This process will increase the loss of soil moisture thus resulting in a larger deficit that will need to be refilled in the next year of irrigation. Another method to control dust is irrigation associated with the establishment of a cover crop. If any water is applied to establish a cover crop, then it would be in violation of Term and Condition No. 11.

The only method stated for weed control is mowing of the weeds or application of herbicides. Other measures could include grazing upon Super Ditch's discretion. These standards should be included within the Terms and Conditions approved for the Applicants' operation of the Pilot Project so that the Applicants will be obligated to control weeds and soil erosion in the event that farmer fails to honor the contract.

As for dry-land farming, the individual contracts with the farmers do not specifically allow for dry-land farming to occur or any standards that would be applied if dry-land farming were to occur. The only mention of potential dry-land farming in the farmer's contract is in Paragraph 11.b regarding Stubble Fields. Even if this paragraph is determined to allow farming there are no standards to determine "If existing stubble is not deemed adequate". LAWMA's position is that the standards determined to be necessary by the Applicants' experts and legal counsel who happen to be the same experts and legal counsel for the Lower Arkansas Valley Water Conservancy District in LAWMA's Case No. 15CW3067 for dry-land farming be used on any dry-land farming operation under the Pilot Project. It is irrelevant if the parcels are dried up permanently or temporarily. At no time should the stubble be furrowed or chiseled as this will increase the soil moisture deficit to be replaced in the following irrigation year. At minimum, the following standards should be applied to any parcel fallowed under the Pilot Project:

i. The dry-up parcel will be planted and farmed without irrigation water, such that it is dependent solely upon precipitation to meet crop water requirements; if other dry-land farming in the region is producing crops, the farm also is producing a dry-land crop with weeds adequately controlled and with soil erosion from wind controlled in a manner consistent with state and local law; and minimum crop residue after harvest of the dryland crop is as described below, and the crop residue is left on the Dry-Up Parcel until the Dry-Up Parcel is prepared for the next rotation of planting; provided, however, that this requirement for crop residue does not prevent a farmer from controlling weeds by mechanical tillage of the Dry-Up Parcel or using other acceptable methods of weed control that do not disturb the residue on the surface. For grain crops, such as winter wheat or milo, minimum crop residue must be at least thirty percent (30%), determined by the step-point method. For hay or forage crops, crop stubble must measure at least five inches, with row spacing no more than thirty inches.

ii. For each dry-up parcel that was dry-land farmed during the preceding year, Applicants shall submit a report that documents the efforts undertaken in the

preceding year to dryland farm the parcel, including information about tilling practices, the planting and fallowing rotation, the crops planted, and the acres fallowed; information about herbicides or pesticides applied; information about efforts to control erosion of the soil caused by wind; information about the amount of crops harvested or the number of animal units grazing the land; and information about the amount of crops planted and harvested by other dry-land farmers in the area during the preceding year; if the crop is a grain crop, the percentage crop residue determined using the step-point method, and if the crop is a hay/forage crop, the stubble height in inches and the row spacing in inches.

Finally, the Applicants have asserted that the same terms and conditions that were applied in the Catlin Pilot Project should remain in this Pilot Project. The purpose of these Pilot Projects is to determine what works and what needs to be improved upon. The annual reports from the Catlin Pilot Project provide no detailed information on the farms that were dry-land farmed the previous year other than vague descriptions about the yield. LAWMA believes that this part of the annual reporting can be improved, as described above, by the inclusion of water budget analyses, what herbicides where used, whether weeds were mowed, how much crop residue was remaining on the dry-up fields, etc. in the Applicants annual reporting.

The terms and conditions set forth in this Joint Conference Report as either "agreed to" or "unresolved" are based on the parties' current understanding of the Pilot Project and information presented to date. All of these terms and conditions are the subject of negotiation and compromise and shall not be relied on as establishing any precedent in any other proceeding. In submitting this Joint Conference Report, no party is waiving its right to challenge on appeal any approval of the Pilot Project, in whole or in part, or to litigate or provide evidence or expert testimony on any issue as a part of any water court appeal taken from any CWCB or State Engineer's Office approval of the Pilot Project, subject to the right of other parties to object to such testimony or evidence. Likewise, by signing this Joint Conference Report, the commenting parties do not waive any objections they have raised or comments they have submitted regarding the Pilot Project, including without limitation any such objections or comments not addressed herein.

6. Whether or not there must be a term and condition stating that "there shall be no renewal of this temporary lease/fallow project after the ten year term. Any continuation of this operation must first obtain Water Court approval under the resume-notice procedure."

A. Applicants' Position: Applicants should not be prohibited from applying for another pilot project in the future if it is determined that another pilot project would be beneficial. Pilot projects are intended to analyze the efficacy of leasing-fallowing projects, and it may be beneficial to operate another project using lessons learned in the current Pilot Project, and applying different or modified methods. This term and condition is overly-restrictive.

B. Pueblo West's Position: There shall be no renewal of this temporary lease/fallowing project after the ten year term. Any continuation of this operation must first obtain Water Court approval under the resume-notice procedure.

7. Whether or not lagged return flows must be replaced upstream of the location of the lagged return flow at all times.

A. Applicants' Position: Lagged return flows must be replaced upstream of the calling water right, which is consistent with preventing injury to other water rights as required by the Criteria and Guidelines.

B. Pueblo West's Position: Lagged return flows must be replaced upstream of the location of the lagged return flow at all times.

8. Whether or not the terms and conditions clearly delineate how exchanges under 05CW96 may be used.

A. Applicants' Position: The agreed-to terms and conditions clearly delineate this issue.

B. Pueblo West's Position: It needs to be clear exactly how each exchange is going to be used to support this project. There are two exchanges mentioned in the engineering report: a) 05CW96 which is Colorado Spring's exchange, and b) 10CW04 which is the Super Ditch exchange case. The 10CW04 case specifically limits the sources of substitute supply for the exchanges to lease water from the water rights in Paragraph 12 of that decree. We believe that the exchanges in 10CW04 are the only exchanges available to initially move leased water up to Pueblo Reservoir. The exchange from Fountain Creek to Pueblo Reservoir in 05CW96 can then only be used to exchange the return flows from leased water flowing down Fountain Creek. If this is not the case, Pueblo West is concerned that Colorado Springs in 05CW96 may be used as a way to get around limitations in the 10CW04 decree, specifically including the Colorado Springs priority date of 8/20/2018 in 10CW04. It should also be specified that using the exchange in 05CW96 for this project is subject to all the provisions in that decree, including specific provisions and identification of what "Class" of water is considered in this Pilot Project.

9. Whether or not Super Ditch's engineers must submit supplemental engineering related to whether the results of the LFT are consistent with 12CW94, and why any 12CW94 results are not being used.

A. Applicants' Position: The agreed-to terms and conditions have addressed the issue of 12CW94 consistent with the discussion of this issue during the conference.

B. Pueblo West's Position: Prior to any approval, Super Ditch's engineers must explain by a supplemental report sent to all parties, whether the results of the Lease Fallowing Tool (LFT) are consistent with the findings in the Catlin Change Case (12CW94), and if not, why the findings of that case are not being used? A lot of time was spent to assure that the terms and conditions in that case and in 10CW4 were sufficient to prevent injury to Pueblo West's exchanges and to other water rights.

10. Whether or not a term and condition must be added stating that "Super Ditch must lease enough space in Pueblo Reservoir to assure that the requirements of the 10CW4 Decree are met, prior to exchanging water into Pueblo Reservoir."

A. Applicants' Position: The agreed-to terms and conditions clearly define that Applicants must obtain and comply with approvals for storage space in Pueblo Reservoir. This term and condition is vague.

B. Pueblo West's Position: Super Ditch must lease enough space in Pueblo Reservoir to assure that the requirements of the 10CW4 Decree are met, prior to exchanging water into Pueblo Reservoir.

11. Whether or not additional terms and conditions relevant to the decree in 10CW4 must be added to address stepped exchanges.

A. Applicants' Position: The agreed-to terms and conditions prevent injury to existing water rights and incorporate all necessary relevant conditions from the 10CW4 Decree.

B. Pueblo West's Position: The stepped exchange provisions in 10CW4 should be applied to all exchanges under the Pilot Project regardless under which decree, or which administrative approval, the exchange is operated.

12. Whether or not additional terms and conditions need to be added related to delivery of return flow water.

A. Applicants' Position: The agreed-to terms and conditions prevent injury to existing water rights and are appropriate for this Pilot Project.

B. Pueblo West's Position: Delivery of return flow water that is needed to replicate historical conditions must be made on a daily basis; only excess return flow water can be stored for later release.

13. Whether additional terms and conditions need to be added to address the potential high groundwater issue.

A. Applicants' Position: The agreed-to terms and conditions prevent injury to existing water rights and are appropriate for this Pilot Project.

B. Pueblo West's Position: In order to receive HCU credit, dry-up must be confirmed and monitored by (a) establishing monitoring wells or piezometers on all dry-up parcels except those approved by the Division Engineer as not being susceptible to high groundwater table; (b) notifying all parties to this proceeding and those in Case 10CW4 as to the location (by legal description and map) of all dry up parcels no later than 1 March for the coming year; and (c) posting those parcels sufficiently to allow "windshield" or "drive by" confirmation of the absence of plant growth attributable to high ground water or irrigation.

RESPECTFULLY SUBMITTED THIS 21ST DAY OF NOVEMBER, 2019 BY THE UNDERSIGNED CONFERENCE PARTICIPANTS

Megan Gutwein for Applicant, Lower Arkansas Valley Super Ditch Company, Inc.

/s/ Megan Gutwein

Matt Montgomery for Applicant, Colorado Springs Utilities

/s/ Matt Montgomery

Mary Presecan for Five Rivers Cattle Feeding LLC, d/b/a Colorado Beef

/s/ Mary Presecan

Richard Mehren for Lower Arkansas Water Management Association

/s/ Richard Mehren

Bob Krassa for Pueblo West Metropolitan District

/s/ Bob Krassa

Steve Leonhardt for Southeastern Colorado Water Conservancy District

/s/ Steve Leonhardt

COLORADO
Division of Water Resources
Department of Natural Resources

MEMORANDUM

To: Kevin Rein, P.E. – Colorado State Engineer

From: Kelley Thompson, P.E. - DWR Senior Lead Modeler
Tracy Kosloff, P.E. - DWR Deputy State Engineer
Bill Tyner, P.E. - DWR Division 2 Division Engineer

Date: December 20, 2019

Subject: DWR Dryland Crop Analysis – HB13-1248 Pilot Project, 2019 SuperDitch/CSU

Introduction

The State Engineer's Determination dated December 6, 2019 for the Colorado Springs and Super Ditch ("Applicants") HB13-1248 Fallowing-Leasing Pilot Project contemplated disputed terms and conditions related to dry-land farming on fallowed fields. The Applicants supplied a memo that suggested that dry-land farming can cause additional depletions to soil moisture as compared to land that is kept bare under certain conditions. The State Engineer's Determination stated that "The Division of Water Resources will conduct additional modeling analysis related to soil moisture depletion resulting from dry-land farming and the resulting impact when the field is subsequently irrigated." This report describes the additional modeling analysis conducted by DWR. The determination also noted that DWR will circulate the analysis to the parties and provide a summary of the analysis and comments to the CWCB that may include a recommended additional term and condition for Board consideration.

Discussion

Pursuant to the HB1248 Criteria and Guidelines, the applicants can apply the subject water rights to a new use as long as other water rights are not injured. As the Arkansas River is almost always under a call, for the current project an injury would occur if return flows that would have accrued to downstream water rights if the water right was used for its original use are reduced in timing or amount. During a normal irrigation season, available soil moisture is depleted by crop evapo-transpiration and evaporation from bare soil or stubble but can be replenished by excess irrigation water or excess "effective" precipitation during the summer or winter months. At the start of the next irrigation season, soil moisture could be wet or dry depending on these processes. When a field is temporarily fallowed, the volume of stored soil moisture is similarly affected by bare soil/stubble evaporation and demands of any dryland or cover crop but is only refilled by excess effective precipitation. At the start of new irrigation season, if a temporary fallowing practice causes the soil moisture storage to be less than it

would have been if the field had been normally irrigated then that could cause a reduction in return flows and an impact to downstream water rights.

Bare soil or stubble evaporation in a temporarily fallowed field can reduce soil moisture storage below what it would have been irrigated as normal, but there is no reasonable way to avoid this effect in a temporary fallowing project. This impact was noted during development of the HB1248 Criteria and Guidelines and the conservative measures mandated in those guidelines were thought to more than offset the impact of bare soil or stubble evaporation. However, planting of a dryland crop could potentially increase those impacts. Based on the concerns expressed by parties to the Application and discussion at the conference, the project applicants submitted a memo of the effects of dryland crop on soil moisture storage that suggested that the practice could impact return flows under certain conditions. The current analysis attempts to more thoroughly compare soil moisture after a dryland crop to soil moisture after normal irrigation under a range of hydrologic conditions.

Methods

The Lease Fallow Tool (LFT) facilitates evaluation of historic consumptive use, depletions, and return flows. Although the tool as compiled could be used to evaluate impacts, for this analysis the tool code was modified to rapidly run several thousand scenarios under varying conditions.

The LFT can utilize the more conservative (indicating lower depletions) values for evapo-transpiration (ET), application efficiency, and soil moisture storage specified in the HB1248 Criteria and Guidelines or values that are not necessarily conservative such as those used in the Hydrologic-Institutional (H-I) Model which is used for administration of the Arkansas River Compact. Although all modeling has some degree of uncertainty, modeling using values from the H-I Model are expected to more accurately estimate actual field conditions than if the HB1248 measures were used. Therefore, the H-I Model dataset, except the values for canal losses, was used to estimate any impacts to soil moisture caused by fallowing practices. Canal losses (from case 12CW94), acreage and share data for the analysis were taken from the LFT model produced by the applicant.

Given the lease terms with Colorado Springs, spring wheat may be a more likely dryland crop than winter wheat. Using diversion, climate, and ET data for 1950 through 2018, the LFT was used to compare soil moisture at the beginning of March following a year of either normal irrigation to soil moisture following a year with no irrigation but with ET demands from a spring grain. For each of the five subject farms, scenarios were run for each case for the full 1950 through 2018 period but with one fallow year that varied between 1951 and 2017. Soil moisture was also compared for scenarios after two and three subsequent years of dryland crops. The H-I Model includes an estimate of bare soil or stubble evaporation that is used in

months with no crop ET, and these values are available in the LFT. Therefore, scenarios were also run that compared soil moisture between a bare soil (assuming H-I model bare soil evaporation rates) and both dryland cropping and normal irrigation.

Results

Results of the analysis are presented in the following tables. For reference, Table 1 shows the difference in historical depletions that are quantified using the H-I Model data or when using values specified in the HB1248 Criteria and Guidelines in acre-feet per acre (historical on-farm depletions based on H-I model assumptions minus those for HB1248 assumptions).

Tables 2 through 4 present average annual impacts due to dryland cropping for ranges of diversions by the Catlin Ditch during the year(s) of the dryland crop (soil moisture after irrigation minus soil moisture after dryland cropping); the ranges represent the 10%, 25%, 50%, and 75% percentiles of annual ditch diversion. These ranges were calculated from the data in Table 7 which shows the difference in March soil moisture after one or multiple years of dryland cropping versus normal irrigation by year and by farm as a ratio of available water capacity (AWC), between 0 (empty) and 1 (full). For Tables 2 through 4, ratios were multiplied by the AWC and rooting depth values from the H-I model for the Catlin Canal (0.17 * 3.84ft = 0.6528 ft) to estimate the impact on an acre-foot per acre basis. Impacts by diversion are similar after one or multiple years of dryland crops except after three years under very dry conditions; this value was influenced by the 2002 through 2004 period which had very low diversions and impacts in 2002 and 2003 but relatively high diversions and impacts in 2004. Of note, the impact from multiple years of dryland cropping would only occur once the field is re-irrigated. So, if the three years of operation occur concurrently, the impact only occurs once, upon re-irrigation.

As shown in Table 5, which presents soil moisture after irrigation minus soil moisture after a year of bare soil, soil moisture after either bare soil or normal irrigation is similar on average but varies somewhat based on hydrologic conditions. The difference between these two cases may be more pronounced in other ditch systems or other areas. Table 6 compares soil moisture resulting from dryland cropping to bare soil evaporation (soil moisture after a year of bare soil minus soil moisture after a year of dryland cropping). Again, bare soil evaporation would occur under any fallowing project. Values in Table 6 were correlated to ditch diversions from the year prior to the fallowing with the dryland crop. The differences in March soil moisture from which these ranges were calculated are presented in Table 8 (bare soil minus dryland crop).

Results shown in this document on an acre-foot per acre basis can be used to estimate total impact to project operation by multiplying by an acreage to be dryland farmed under project

operations. We do not currently have an indication of how much land would be dryland farmed, but, for illustrative purposes, we can estimate an acreage as follows:

- In the current HB1248 pilot project on the Catlin Canal, dryland crops have been grown on about 57% of the total acreage fallowed (from 2015-2018).
- The applicants (according to Table 5 in the application) estimated that about 622 acres may be fallowed in years the pilot project is operated.

Therefore, a potential estimate is that 355 acres will be dryland farmed.

Table 1. Difference in On-Farm Depletions between H-I Model and HB1248 Data (AF/acre)

Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53000	very dry	**0.18**	0.239	0.219	0.101	0.137	0.213
53000 - <74000	dry	**0.30**	0.394	0.378	0.163	0.158	0.385
74000 - 102000	avg	**0.34**	0.381	0.375	0.277	0.294	0.371
>102000	wet	**0.32**	0.310	0.314	0.327	0.318	0.316

Table 2. Average Soil Moisture Impacts After One Year of a Dryland Crop (AF/acre)

Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53,000	very dry	**0.01**	0.036	0.026	-0.024	-0.012	0.027
53,000 - <74,000	dry	**0.22**	0.319	0.317	0.076	0.080	0.325
74,000 - 102,000	avg	**0.34**	0.436	0.436	0.160	0.234	0.433
>102,000	wet	**0.40**	0.480	0.448	0.293	0.354	0.448

Table 3. Average Soil Moisture Impacts After Two Subsequent Years of a Dryland Crop (AF/acre)

Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53,000	very dry	**0.06**	0.110	0.089	0.003	0.012	0.091
53,000 - <74,000	dry	**0.21**	0.323	0.293	0.061	0.093	0.297
74,000 – 102,000	avg	**0.35**	0.433	0.444	0.173	0.237	0.442
>102,000	wet	**0.39**	0.460	0.416	0.290	0.360	0.416

Table 4. Average Soil Moisture Impacts After Three Subsequent Years of a Dryland Crop (AF/acre)

Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53,000	very dry	**0.21**	0.292	0.282	0.009	0.208	0.283
53,000 - <74,000	dry	**0.19**	0.269	0.249	0.079	0.117	0.251
74,000 – 102,000	avg	**0.34**	0.442	0.451	0.171	0.206	0.450
>102,000	wet	**0.40**	0.475	0.424	0.288	0.402	0.423

Table 5. Average Difference in Soil Moisture Between Irrigation and Bare Soil After One Year (AF/acre)

Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53,000	very dry	**-0.14**	-0.141	-0.151	-0.122	-0.156	-0.148
53,000 - <74,000	dry	**0.04**	0.092	0.076	-0.021	-0.024	0.083
74,000 – 102,000	avg	**0.05**	0.122	0.111	-0.060	-0.009	0.108
>102,000	wet	**0.06**	0.091	0.082	-0.003	0.030	0.082

Table 6. Average Difference in Soil Moisture Between Bare and Dryland Crop After One Year (AF/acre)

Previous Year's* Diversion (AF/yr)	Type	Average	Diamond A	Schweizer	Mameda	Groves	Mayhoffer
<53000	very dry	**0.15**	0.152	0.147	0.121	0.181	0.147
53000 - <74000	dry	**0.21**	0.233	0.252	0.161	0.157	0.254
74000 - 102000	avg	**0.29**	0.343	0.345	0.206	0.233	0.344
>102000	wet	**0.32**	0.343	0.335	0.275	0.298	0.335

Note: *Annual ditch diversions to irrigation use, *the year before fallowing*

Table 7. Difference in March Soil Moisture Between Normal Irrigation and a Dryland Crop

Year	Soil Moisture Diff (ratio of AWC) - One Year Crop					Soil Moisture Diff (ratio of AWC) - Two Year Crop					Soil Moisture Diff (ratio of AWC) - Three Year Crop				
	Diam.A	Schwei.	Mameda	Groves	Mayhof.	Diam.A	Schwei.	Mameda	Groves	Mayhof.	Diam.A	Schwei.	Mameda	Groves	Mayhof.
1951	0.334	0.373	0.337	0.326	0.365	0.515	0.548	0.215	0.203	0.543	0.735	0.756	0.327	0.316	0.752
1952	0.515	0.548	0.215	0.203	0.543	0.735	0.756	0.327	0.316	0.752	-0.029	-0.048	-0.174	-0.177	-0.045
1953	0.735	0.756	0.327	0.316	0.752	-0.029	-0.048	-0.174	-0.177	-0.045	0.338	0.285	-0.004	-0.012	0.294
1954	-0.029	-0.048	-0.174	-0.177	-0.045	0.338	0.285	-0.004	-0.012	0.294	0.337	0.303	0.084	0.079	0.309
1955	0.338	0.286	-0.002	-0.010	0.294	0.337	0.303	0.084	0.079	0.309	0.253	0.280	0.471	0.477	0.276
1956	0.337	0.303	0.084	0.079	0.309	0.253	0.280	0.471	0.477	0.276	0.708	0.718	0.160	0.148	0.717
1957	0.240	0.268	0.468	0.474	0.263	0.708	0.718	0.160	0.147	0.717	0.600	0.611	0.261	0.249	0.609
1958	0.701	0.712	0.154	0.143	0.710	0.600	0.611	0.261	0.249	0.609	0.593	0.558	0.132	0.124	0.571
1959	0.595	0.607	0.260	0.248	0.605	0.593	0.558	0.132	0.124	0.571	0.704	0.724	0.489	0.455	0.721
1960	0.589	0.555	0.131	0.123	0.568	0.704	0.724	0.489	0.455	0.721	0.702	0.720	0.413	0.376	0.717
1961	0.689	0.712	0.486	0.453	0.708	0.702	0.720	0.413	0.376	0.717	0.353	0.301	0.007	0.001	0.310
1962	0.692	0.710	0.409	0.372	0.707	0.353	0.301	0.007	0.001	0.310	0.478	0.515	0.194	0.186	0.508
1963	0.349	0.297	0.005	0.000	0.306	0.478	0.515	0.194	0.186	0.508	0.458	0.469	0.093	0.060	0.467
1964	0.477	0.514	0.194	0.186	0.507	0.458	0.469	0.093	0.060	0.467	0.238	0.275	0.044	0.028	0.269
1965	0.439	0.452	0.087	0.054	0.450	0.238	0.275	0.044	0.028	0.269	0.791	0.807	0.348	0.332	0.804
1966	0.237	0.274	0.044	0.028	0.268	0.791	0.807	0.348	0.332	0.804	0.480	0.513	0.107	0.089	0.508
1967	0.776	0.792	0.347	0.331	0.789	0.480	0.513	0.107	0.089	0.508	0.775	0.787	0.143	0.134	0.785
1968	0.475	0.508	0.105	0.087	0.503	0.775	0.787	0.143	0.134	0.785	0.690	0.708	0.366	0.342	0.705
1969	0.755	0.766	0.141	0.132	0.764	0.690	0.708	0.366	0.342	0.705	0.576	0.594	0.249	0.219	0.591
1970	0.686	0.704	0.366	0.342	0.701	0.576	0.594	0.249	0.219	0.591	0.000	0.531	0.000	0.152	0.544
1971	0.575	0.594	0.249	0.218	0.591	0.000	0.531	0.000	0.152	0.544	0.733	0.741	0.112	0.155	0.739
1972	0.000	0.530	0.000	0.151	0.543	0.733	0.741	0.112	0.155	0.739	0.505	0.465	0.187	0.181	0.472
1973	0.733	0.733	0.112	0.153	0.731	0.505	0.465	0.187	0.181	0.472	0.747	0.531	0.086	0.081	0.561
1974	0.502	0.462	0.186	0.181	0.469	0.747	0.531	0.086	0.081	0.561	0.786	0.686	0.147	0.137	0.734
1975	0.743	0.527	0.085	0.080	0.558	0.786	0.686	0.147	0.137	0.734	0.201	0.165	-0.067	0.000	0.171
1976	0.782	0.683	0.146	0.137	0.731	0.201	0.165	-0.067	0.000	0.171	0.088	0.065	0.002	0.010	0.068
1977	0.196	0.162	-0.068	0.000	0.167	0.088	0.065	0.002	0.010	0.068	0.844	0.844	0.165	0.148	0.844
1978	0.086	0.063	0.003	0.010	0.066	0.844	0.844	0.165	0.148	0.844	0.819	0.819	0.191	0.163	0.819
1979	0.840	0.842	0.165	0.148	0.841	0.819	0.819	0.191	0.163	0.819	0.516	0.431	0.132	0.110	0.442
1980	0.814	0.814	0.190	0.162	0.814	0.516	0.431	0.132	0.110	0.442	0.947	0.947	0.278	0.234	0.947
1981	0.516	0.431	0.132	0.110	0.442	0.947	0.947	0.278	0.234	0.947	0.943	0.943	0.276	0.227	0.943
1982	0.931	0.934	0.274	0.231	0.933	0.943	0.943	0.276	0.227	0.943	0.809	0.809	0.338	0.259	0.809
1983	0.926	0.926	0.271	0.224	0.926	0.808	0.808	0.338	0.259	0.808	0.817	0.816	0.467	0.375	0.816
1984	0.802	0.802	0.336	0.258	0.802	0.817	0.816	0.467	0.375	0.816	0.687	0.687	0.481	0.310	0.687
1985	0.808	0.807	0.464	0.373	0.807	0.687	0.687	0.481	0.310	0.687	0.972	0.000	0.543	0.411	0.000
1986	0.677	0.677	0.475	0.306	0.677	0.972	0.000	0.543	0.411	0.000	0.930	0.925	0.306	0.229	0.925
1987	0.959	0.000	0.535	0.406	0.000	0.930	0.925	0.306	0.229	0.925	0.849	0.849	0.166	0.093	0.849
1988	0.925	0.925	0.304	0.227	0.925	0.849	0.849	0.166	0.093	0.849	0.574	0.574	0.174	0.574	0.574
1989	0.838	0.838	0.163	0.091	0.838	0.574	0.574	0.174	0.574	0.574	0.852	0.852	0.322	0.852	0.852
1990	0.574	0.574	0.174	0.574	0.574	0.852	0.852	0.322	0.852	0.852	0.864	0.864	0.562	0.864	0.864
1991	0.848	0.848	0.321	0.848	0.848	0.864	0.864	0.562	0.864	0.864	0.789	0.789	0.461	0.789	0.789
1992	0.846	0.846	0.555	0.846	0.846	0.789	0.789	0.461	0.789	0.789	0.763	0.763	0.423	0.763	0.763
1993	0.782	0.782	0.457	0.782	0.782	0.763	0.763	0.423	0.763	0.763	0.894	0.894	0.662	0.894	0.894
1994	0.760	0.760	0.421	0.760	0.760	0.894	0.894	0.662	0.894	0.894	0.836	0.836	0.777	0.836	0.836
1995	0.848	0.848	0.639	0.848	0.848	0.836	0.836	0.777	0.836	0.836	0.398	0.398	0.265	0.398	0.398
1996	0.829	0.829	0.772	0.829	0.829	0.398	0.398	0.265	0.398	0.398	0.504	0.504	0.382	0.504	0.504
1997	0.384	0.384	0.254	0.384	0.384	0.504	0.504	0.382	0.504	0.504	0.644	0.643	0.471	0.642	0.643
1998	0.504	0.504	0.382	0.504	0.504	0.644	0.643	0.471	0.642	0.643	0.918	0.918	0.387	0.918	0.918
1999	0.631	0.629	0.460	0.628	0.629	0.918	0.918	0.387	0.918	0.918	0.923	0.923	0.306	0.923	0.923
2000	0.916	0.916	0.386	0.916	0.916	0.923	0.923	0.306	0.923	0.923	0.000	0.000	0.000	0.000	0.000
2001	0.909	0.909	0.301	0.909	0.909	0.000	0.000	0.000	0.000	0.000	0.078	0.060	0.015	0.057	0.058
2002	0.000	0.000	0.000	0.000	0.000	0.078	0.060	0.015	0.057	0.058	0.559	0.559	-0.058	0.559	0.559
2003	0.078	0.060	0.015	0.057	0.058	0.559	0.559	-0.058	0.559	0.559	0.740	0.740	0.198	0.740	0.740
2004	0.558	0.558	-0.058	0.558	0.558	0.740	0.740	0.198	0.740	0.740	0.250	0.250	0.107	0.250	0.250
2005	0.737	0.737	0.198	0.737	0.737	0.250	0.250	0.107	0.250	0.250	0.905	0.905	0.606	0.905	0.905
2006	0.250	0.250	0.107	0.250	0.250	0.905	0.905	0.606	0.905	0.905	0.604	0.604	0.264	0.579	0.604
2007	0.889	0.889	0.600	0.889	0.889	0.604	0.604	0.264	0.579	0.604	0.671	0.671	0.465	0.671	0.671
2008	0.603	0.603	0.263	0.578	0.603	0.671	0.671	0.465	0.671	0.671	0.785	0.739	0.155	0.298	0.715
2009	0.660	0.660	0.460	0.661	0.660	0.785	0.739	0.155	0.298	0.715	0.752	0.721	0.241	0.287	0.657
2010	0.780	0.734	0.151	0.293	0.709	0.752	0.721	0.241	0.287	0.657	0.004	0.002	0.000	0.000	0.002
2011	0.752	0.720	0.241	0.287	0.657	0.004	0.002	0.000	0.000	0.002	0.951	0.801	0.397	0.512	0.761
2012	0.004	0.002	0.000	0.000	0.002	0.951	0.801	0.397	0.512	0.761	0.510	0.510	0.281	0.510	0.510
2013	0.951	0.801	0.397	0.512	0.761	0.510	0.510	0.281	0.510	0.510	0.854	0.854	0.476	0.576	0.854
2014	0.501	0.504	0.278	0.506	0.504	0.854	0.854	0.475	0.576	0.854	0.819	0.819	0.368	0.324	0.819
2015	0.825	0.825	0.462	0.547	0.825	0.818	0.818	0.368	0.323	0.818	0.584	0.584	0.398	0.323	0.584
2016	0.779	0.779	0.353	0.303	0.779	0.583	0.583	0.398	0.322	0.583					
2017	0.555	0.555	0.387	0.313	0.555										
Avg%	**0.60**	**0.59**	**0.25**	**0.34**	**0.59**	**0.61**	**0.60**	**0.26**	**0.34**	**0.60**	**0.62**	**0.60**	**0.26**	**0.34**	**0.60**
AF/ac	**0.39**	**0.38**	**0.17**	**0.22**	**0.38**	**0.40**	**0.39**	**0.17**	**0.22**	**0.39**	**0.40**	**0.39**	**0.17**	**0.22**	**0.39**

Note: Year shown is for year of first dryland crop, dryland crop assumed to be spring grain

Table 8. Difference in March Soil Moisture Between Bare Soil and a Dryland Crop

Year	Soil Moisture Diff (ratio of AWC) - One Year Crop					Soil Moisture Diff (ratio of AWC) - Two Year Crop					Soil Moisture Diff (ratio of AWC) - Three Year Crop				
	Diam.A	Schwei.	Mameda	Groves	Mayhof.	Diam.A	Schwei.	Mameda	Groves	Mayhof.	Diam.A	Schwei.	Mameda	Groves	Mayhof.
1951	0.334	0.373	0.398	0.416	0.365	0.351	0.351	0.224	0.232	0.351	0.420	0.420	0.354	0.358	0.420
1952	0.506	0.506	0.198	0.194	0.506	0.516	0.516	0.343	0.341	0.516	0.358	0.374	0.281	0.281	0.374
1953	0.618	0.618	0.351	0.345	0.618	0.358	0.384	0.285	0.283	0.379	0.388	0.416	0.403	0.402	0.412
1954	0.358	0.384	0.274	0.268	0.379	0.388	0.416	0.396	0.394	0.412	0.372	0.361	0.261	0.260	0.368
1955	0.258	0.250	0.198	0.197	0.251	0.206	0.203	0.182	0.182	0.204	0.253	0.280	0.471	0.477	0.276
1956	0.238	0.217	0.104	0.101	0.221	0.253	0.280	0.471	0.477	0.276	0.708	0.718	0.776	0.776	0.717
1957	0.240	0.268	0.468	0.474	0.263	0.708	0.718	0.776	0.776	0.717	0.586	0.586	0.586	0.586	0.586
1958	0.701	0.712	0.770	0.771	0.710	0.586	0.586	0.586	0.586	0.586	0.489	0.489	0.480	0.479	0.489
1959	0.595	0.603	0.205	0.199	0.605	0.527	0.507	0.269	0.266	0.527	0.704	0.684	0.490	0.488	0.704
1960	0.569	0.569	0.292	0.286	0.569	0.704	0.724	0.507	0.503	0.721	0.514	0.514	0.344	0.342	0.514
1961	0.689	0.712	0.397	0.392	0.708	0.546	0.501	0.289	0.287	0.513	0.297	0.278	0.189	0.188	0.283
1962	0.575	0.575	0.329	0.312	0.575	0.314	0.314	0.208	0.200	0.314	0.154	0.154	0.120	0.118	0.154
1963	0.486	0.517	0.240	0.224	0.512	0.222	0.222	0.131	0.126	0.222	0.458	0.469	0.482	0.478	0.467
1964	0.165	0.149	0.056	0.054	0.151	0.458	0.469	0.429	0.428	0.467	0.238	0.275	0.395	0.394	0.269
1965	0.439	0.452	0.521	0.516	0.450	0.238	0.275	0.459	0.455	0.269	0.489	0.489	0.473	0.470	0.489
1966	0.237	0.274	0.252	0.240	0.268	0.524	0.524	0.367	0.360	0.524	0.242	0.242	0.176	0.173	0.242
1967	0.693	0.693	0.262	0.254	0.693	0.325	0.325	0.130	0.126	0.325	0.413	0.412	0.298	0.296	0.412
1968	0.475	0.508	0.166	0.159	0.503	0.537	0.536	0.320	0.316	0.536	0.360	0.360	0.264	0.262	0.360
1969	0.755	0.766	0.284	0.274	0.764	0.506	0.506	0.250	0.245	0.506	0.428	0.428	0.296	0.294	0.428
1970	0.556	0.555	0.190	0.186	0.555	0.461	0.460	0.266	0.264	0.460	0.000	0.231	0.000	0.155	0.231
1971	0.575	0.594	0.355	0.343	0.591	0.000	0.332	0.000	0.181	0.332	0.153	0.453	0.153	0.365	0.453
1972	0.000	0.390	0.000	0.140	0.390	0.153	0.496	0.153	0.339	0.496	0.157	0.314	0.152	0.235	0.314
1973	0.153	0.612	0.153	0.344	0.624	0.157	0.379	0.152	0.239	0.387	0.081	0.170	0.081	0.117	0.173
1974	0.536	0.535	0.134	0.153	0.535	0.235	0.235	0.073	0.081	0.235	0.169	0.169	0.095	0.099	0.169
1975	0.217	0.202	0.093	0.091	0.204	0.163	0.156	0.105	0.104	0.157	0.241	0.237	0.212	0.000	0.238
1976	0.417	0.303	0.101	0.099	0.316	0.399	0.321	0.210	0.000	0.330	0.350	0.313	0.261	0.641	0.318
1977	0.473	0.474	0.232	0.000	0.473	0.388	0.388	0.271	0.641	0.388	0.685	0.685	0.580	0.844	0.685
1978	0.254	0.237	0.129	0.641	0.240	0.566	0.551	0.463	0.844	0.553	0.393	0.391	0.341	0.393	0.393
1979	0.429	0.413	0.370	0.383	0.416	0.325	0.316	0.294	0.301	0.318	0.122	0.119	0.111	0.113	0.119
1980	0.388	0.388	0.212	0.207	0.388	0.145	0.145	0.083	0.081	0.145	0.326	0.326	0.291	0.289	0.326
1981	0.306	0.306	0.075	0.066	0.306	0.416	0.416	0.286	0.281	0.416	0.327	0.327	0.266	0.264	0.327
1982	0.532	0.477	0.314	0.302	0.484	0.403	0.367	0.280	0.275	0.372	0.439	0.418	0.366	0.363	0.421
1983	0.443	0.443	0.259	0.241	0.443	0.476	0.476	0.356	0.345	0.476	0.579	0.578	0.472	0.464	0.578
1984	0.781	0.781	0.362	0.333	0.781	0.626	0.625	0.477	0.456	0.625	0.592	0.592	0.491	0.477	0.592
1985	0.616	0.616	0.456	0.404	0.616	0.592	0.592	0.479	0.443	0.592	0.666	0.000	0.650	0.615	0.000
1986	0.676	0.676	0.478	0.417	0.676	0.665	0.000	0.655	0.594	0.000	0.402	0.511	0.396	0.360	0.511
1987	0.653	0.000	0.645	0.503	0.000	0.402	0.511	0.394	0.314	0.511	0.269	0.331	0.264	0.220	0.331
1988	0.511	0.511	0.330	0.267	0.511	0.331	0.331	0.230	0.195	0.331	0.574	0.574	0.503	0.479	0.574
1989	0.634	0.634	0.212	0.170	0.634	0.574	0.574	0.493	0.463	0.574	0.795	0.795	0.734	0.704	0.795
1990	0.574	0.574	0.459	0.408	0.574	0.795	0.795	0.700	0.649	0.795	0.753	0.753	0.748	0.698	0.753
1991	0.792	0.792	0.450	0.792	0.792	0.753	0.753	0.523	0.753	0.753	0.635	0.635	0.469	0.635	0.635
1992	0.735	0.735	0.430	0.735	0.735	0.635	0.635	0.408	0.635	0.635	0.491	0.491	0.337	0.491	0.491
1993	0.627	0.627	0.497	0.627	0.627	0.491	0.491	0.390	0.491	0.491	0.514	0.514	0.514	0.514	0.514
1994	0.601	0.601	0.364	0.601	0.601	0.513	0.513	0.513	0.513	0.513	0.552	0.552	0.552	0.552	0.552
1995	0.468	0.468	0.490	0.468	0.468	0.552	0.552	0.552	0.552	0.552	0.398	0.398	0.398	0.398	0.398
1996	0.706	0.706	0.671	0.706	0.706	0.398	0.398	0.398	0.398	0.398	0.503	0.503	0.503	0.503	0.503
1997	0.384	0.384	0.387	0.384	0.384	0.503	0.503	0.503	0.503	0.503	0.458	0.457	0.452	0.456	0.457
1998	0.503	0.503	0.503	0.503	0.503	0.458	0.457	0.452	0.456	0.457	0.429	0.429	0.429	0.429	0.429
1999	0.445	0.443	0.440	0.442	0.443	0.429	0.429	0.429	0.429	0.429	0.407	0.407	0.407	0.407	0.407
2000	0.557	0.557	0.441	0.557	0.557	0.489	0.489	0.415	0.489	0.489	0.099	0.099	0.084	0.099	0.099
2001	0.571	0.571	0.378	0.571	0.571	0.119	0.119	0.078	0.119	0.119	0.145	0.145	0.129	0.145	0.145
2002	0.202	0.202	0.063	0.202	0.202	0.179	0.179	0.123	0.179	0.179	0.428	0.428	0.391	0.428	0.428
2003	0.098	0.098	0.098	0.098	0.098	0.374	0.374	0.374	0.374	0.374	0.427	0.427	0.427	0.427	0.427
2004	0.360	0.348	0.318	0.346	0.346	0.416	0.407	0.386	0.405	0.406	0.250	0.250	0.250	0.250	0.250
2005	0.585	0.585	0.192	0.585	0.585	0.250	0.250	0.250	0.250	0.250	0.655	0.655	0.655	0.655	0.655
2006	0.250	0.250	0.250	0.250	0.250	0.655	0.655	0.655	0.655	0.655	0.278	0.278	0.278	0.278	0.278
2007	0.640	0.640	0.650	0.640	0.640	0.278	0.278	0.278	0.278	0.278	0.462	0.462	0.462	0.462	0.462
2008	0.478	0.478	0.252	0.478	0.478	0.646	0.646	0.443	0.646	0.646	0.499	0.499	0.499	0.499	0.499
2009	0.638	0.638	0.447	0.639	0.638	0.499	0.499	0.499	0.499	0.499	0.282	0.282	0.282	0.282	0.282
2010	0.494	0.494	0.495	0.494	0.494	0.282	0.282	0.282	0.282	0.282	0.113	0.113	0.113	0.113	0.113
2011	0.442	0.410	0.129	0.192	0.394	0.152	0.144	0.075	0.091	0.141	0.061	0.058	0.030	0.036	0.056
2012	0.246	0.235	0.103	0.114	0.212	0.099	0.094	0.041	0.046	0.085	0.222	0.219	0.178	0.182	0.212
2013	0.002	0.001	0.000	0.000	0.001	0.148	0.148	0.147	0.147	0.147	0.476	0.476	0.476	0.476	0.476
2014	0.501	0.504	0.459	0.506	0.504	0.537	0.537	0.537	0.537	0.537	0.707	0.707	0.707	0.707	0.707
2015	0.509	0.509	0.524	0.509	0.509	0.706	0.706	0.707	0.706	0.706	0.451	0.451	0.451	0.451	0.451
2016	0.666	0.666	0.692	0.687	0.666	0.450	0.450	0.451	0.450	0.450					
2017	0.421	0.421	0.440	0.441	0.421										
Avg%	**0.47**	**0.47**	**0.32**	**0.36**	**0.47**	**0.42**	**0.42**	**0.35**	**0.37**	**0.42**	**0.40**	**0.40**	**0.37**	**0.38**	**0.40**
AF/ac	**0.31**	**0.31**	**0.21**	**0.23**	**0.31**	**0.27**	**0.28**	**0.23**	**0.24**	**0.28**	**0.26**	**0.26**	**0.24**	**0.25**	**0.26**

Note: Year shown is for year of first dryland crop, dryland crop assumed to be spring grain

Determination of the State Engineer

HB 13-1248 Fallowing-Leasing Pilot Project
Application of City of Colorado Springs/Super Ditch for the
Use of Catlin Canal Shares by Colorado Springs Utilities
WDID # 1707701 SWSP #6133
December 6, 2019

I. Introduction

This document serves to fulfill the State Engineer's obligations pursuant to the provisions of HB13-1248 (and as amended by SB-15-198), and the Criteria and Guidelines for Fallowing-Leasing PIlot Projects, specifically related to evaluation and review of the 2019 Colorado Springs and Super Ditch Fallowing-Leasing Pilot Project ("Pilot Project").

A pilot project proposal was submitted to the Colorado Water Conservation Board (CWCB), Rebecca Mitchell, Director, on November 16, 2018 by the Applicants: Lower Arkansas Valley Super Ditch Company (Super Ditch) and the City of Colorado Springs, acting by and through its enterprise, Colorado Springs Utilities (Colorado Springs or CS-U). Following the required comment period and additional information provided by the Applicants, the CWCB Board approved the selection of the proposal at the March 2019 CWCB meeting. The detailed project application was submitted on August 16, 2019. A 60-day comment period followed, ending on October 15, 2019. A Conference Committee meeting was conducted on November 6, 2019 in Pueblo, Colorado. A Joint Conference Report was prepared and submitted to the State Engineer and CWCB on November 21, 2019. Follow-up Memos and revised engineering information responsive to the discussion at the conference were provided by the Applicant on November 27, 2019.

This Determination of the State Engineer was prepared following review of all documents received including the project application, comments received from the interested parties, the Joint Conference Report, which identified a large number of agreed upon terms and conditions as well as some terms and conditions where some disagreement remained, and additional information and suggestions provided by the Applicants and conference participants after the conference. This Determination has also been prepared with recommendations to ensure that the two fundamental objectives identified in C.R.S. 37-60-115 (f)(I) and 37-60-115 (f)(II) will be met if the project is approved with the recommended terms and conditions. These two objectives were:

1. The project will result in only a temporary change in the historical consumptive use of the water right in a manner that will not cause injury to other water rights, decreed conditional water rights, or contract rights to water;
2. The project will not impair compliance with the Arkansas River Interstate compact.

II. Project Overview

The intent of the Pilot Project for the approval period of March 15, 2020 through March 14, 2030 is to fallow fields in three of the ten years to provide Colorado Springs with up to 1,000 acre-feet of

consumptive use water annually in each of the three years. A total of 1,573 shares and 1,433 acres are included in the Pilot Project approval. The Applicants have noted that this number of shares and acreage results in more consumptive use water than the goal of 1,000 acre-feet and that a lesser amount and shares will be fallowed pursuant to the pilot project in each of the three fallow years.

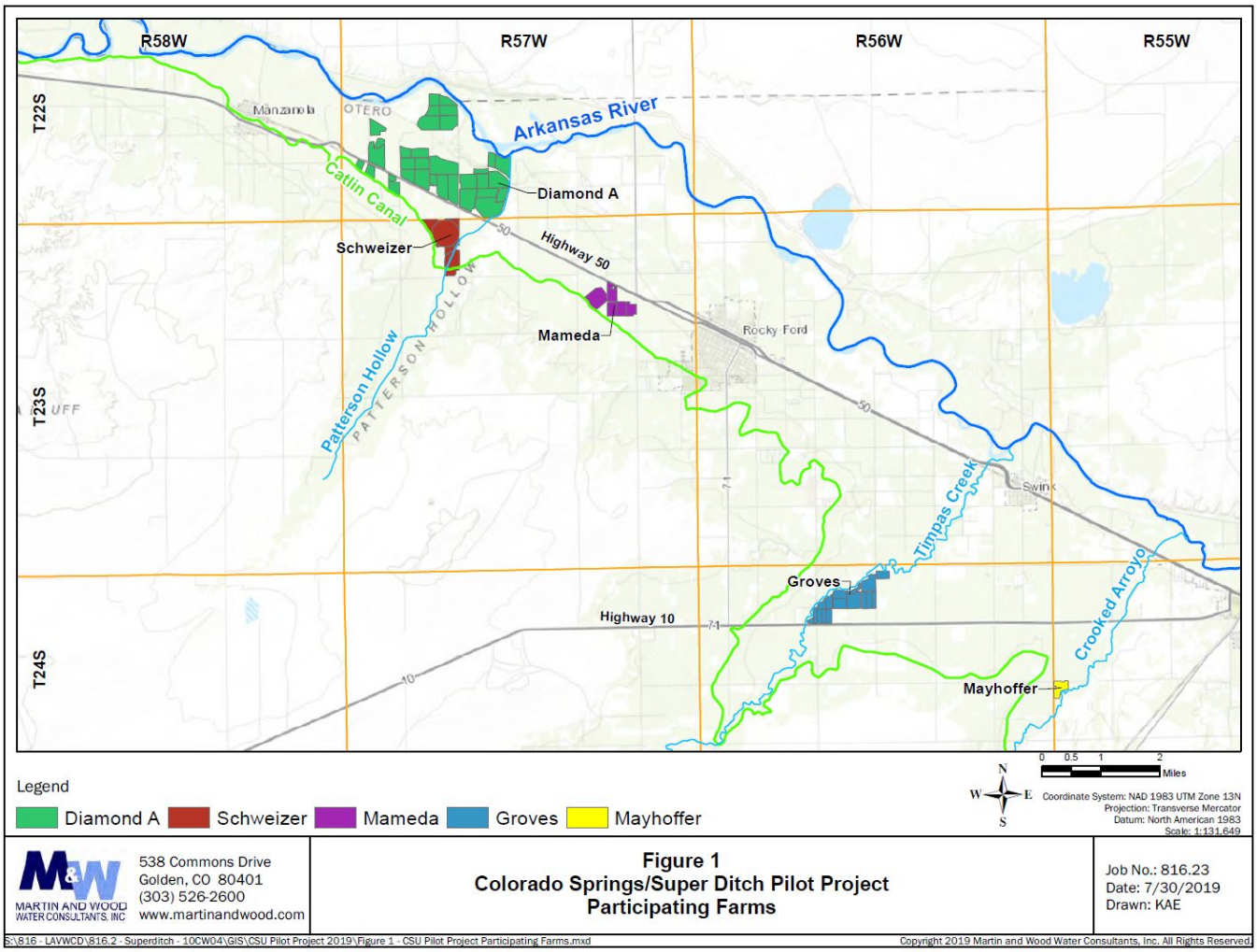
The farms and shares listed in Table A, which is excerpted from the Applicants revised HCU dated November 25 and received November 27, are included in the Pilot Project. Figure 1 shows the locations of the farms.

Table A. Pilot Project Farms and Number of Shares

Participating Farmer	Legal Description of Historically Irrigated Lands	Irrigated Acreage (2015)	Historical Irrigated Acreage[1]	Pilot Project Historical Irrigated Acres[1]	Number of Participant Shares	CPW Shares	Total Number of Shares	Shares per Acre[1]	Participant Associated Share Certificates
Diamond A	Portions of Sections 20, 28, 29, 30, 31, 32, and 33, T22S, R57W of the 6th P.M., Otero County, Colorado	1100.9	1097.71	874.15	1,087.010	278.000	1,365.010	1.244	16, 18, 21, 22, 3604, 3712
Schweizer	Portions of the E1/2 and NW1/4 of Section 5, T23S, R57W of the 6th P.M., Otero County, Colorado	196.9	174.71	174.71	195.476	0.000	195.476	1.119	91, 3493, 3498, 3703
Mameda	Portions of Section 11, T23S, R57W of the 6th P.M., Otero County, Colorado	157.6	157.08	157.08	99.000	0.000	99.000	0.630	42, 43
Groves	Portions of the SE1/4 of Section 5, portions of the NW1/4 of Section 3, and portions of Section 4, T24S, R56W of the 6th P.M., Otero County, Colorado	262.4	217.41	194.95	156.240	18.000*	174.240	0.801	2, 3, 4, 5
Mayhoffer	Portions of the NW1/4 of Section 18, T24S, R55W of the 6th P.M., Otero County, Colorado	35.2	31.61	31.61	35.000	0.000	35.000	1.107	3663
Total	-	1753.0	1678.52	1,432.5	1,572.726	296.000	1868.726	1.098	-

[1]Average for relevant study period. The CPW shares were included in the historical consumptive use analysis per dscussion at the November 6, 2019 CS-U/SuperDitch Pilot Project Conference. The CPW shares are factored out of the results by proportionately reducing the Pilot Project Historical Irrigated Acres to that irrigated only by the participant shares.

*Groves leased 30 CPW shares for 18 years of the 30-year study period. The average of 18 shares per year is used for the purposes of this table.



MARTIN AND WOOD WATER CONSULTANTS, INC
538 Commons Drive
Golden, CO 80401
(303) 526-2600
www.martinandwood.com

Figure 1
Colorado Springs/Super Ditch Pilot Project
Participating Farms

Job No.: 816.23
Date: 7/30/2019
Drawn: KAE

S:\816 - LAVWCD\816.2 - Superditch - 10CW04\GIS\CSU Pilot Project 2019\Figure 1 - CSU Pilot Project Participating Farms.mxd

The water will be diverted by the Catlin Canal and, minus ditch and lateral losses, returned to the Arkansas River via one or more augmentation stations. The deliveries to the Arkansas River will include replacement of tailwater return flows and lagged deep percolation return flows requiring replacement that day. The remaining deliveries will be exchanged to Pueblo Reservoir if exchange potential is available, or stored and exchanged later, if and when exchange potential is available.

III. Terms and Conditions to Prevent Injury and Compact Impairment

The following terms and conditions are recommended for adoption by the CWCB if this project is approved. First, the terms and conditions agreed upon by all of the participants are listed, followed by terms and conditions that were not agreed upon by all parties. Although DWR maintained the numbering of the terms and conditions submitted in the Joint Conference Report, changes were made to the language of many of the "agreed-upon" terms and conditions based on the judgement of the State Engineer and Division Engineer.

III.A: Terms and conditions agreed upon by parties

1. All water attributable to shares in the Pilot Project will first be delivered to the headgate of the Catlin Canal, and only lands irrigated under the Catlin Canal Company will be used in the leasing-fallowing operations of the Pilot Project. A plan year for the Pilot Project extends from March 15 through March 14 of the following year ("Plan Year"). Project duration is from March 15, 2020 through March 14, 2030.
2. The Pilot Project will fallow lands in no more than three of the ten years of approval ("Fallowing Years").
3. **Distribution and Posting**: All submittals by Applicants to DWR pursuant to these Terms and Conditions shall be emailed to augmentation.coordinator@state.co.us (unless another email is provided) and made publicly available by DWR on the pilot project webpage (and via Imaged Documents, Division Filing template, Plan WDID ID No. 1707701) after submittal and shall remain publicly available until all lagged return flow obligations from the Pilot Project have been replaced. The Applicants shall notify parties to the Application when documents have been submitted to DWR. A copy of the annual report required under condition no. 44 shall also be submitted to CWCB and shared on the CWCB website.
4. **Fallowed Lands**: By March 1 of each Fallowing Year, Applicants shall provide mapping of those parcels to be fallowed and the associated shares and provide notice in accordance with condition of approval no. 3. Lands and shares available and approved for fallow through operation of the Pilot Project are limited to those identified in the Pilot Project application and as approved by the State.
5. Review of the application and discussion at the conference resulted in several agreed upon changes to the historical consumptive use (HCU) analysis including the following: The Applicants have agreed to modify the consumptive use analysis to reflect a 30-year study period that does not include years when the parcels were dried up for augmentation credits in well association Rule 14 plans. All volumetric limits will be based on the revised study periods. In addition, the Applicants have agreed to use the 1985 acreage agreed to by Colorado and Kansas.
6. **Composite consumptive use calculations:** The following monthly factors, based on the November 27 revised HCU, will be used to calculate monthly composite consumptive use factors, which will be applied to augmentation station deliveries to determine monthly consumptive use. The monthly composite consumptive use factors will be calculated as the sum of monthly consumptive use for each farm multiplied by the fallowed shares for each farm,

divided by the total number of fallowed shares. The calculation of monthly composite consumptive use factors will be performed for each month from March through November.

Table B. Consumptive Use Factors (multiplied against Augmentation Station Deliveries)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Diamond A	-	-	0.042	0.126	0.282	0.493	0.495	0.497	0.352	0.151	0.044	-
Schweizer	-	-	0.051	0.151	0.367	0.525	0.529	0.534	0.454	0.263	0.197	-
Mameda	-	-	0.521	0.419	0.498	0.550	0.550	0.550	0.550	0.550	0.550	-
Groves	-	-	0.228	0.286	0.427	0.537	0.550	0.550	0.523	0.401	0.345	-
Mayhoffer	-	-	0.058	0.152	0.370	0.526	0.531	0.535	0.450	0.271	0.212	-

Note: for certain parcels on the Schweizer farm located near the canal where groundwater levels have been measured at depths of less than 8 feet, the HCU credit may be reduced if and when those parcels are fallowed as described in condition B13. Such a change will require a change to the factors applied for the Schweizer farm.

7. **Augmentation station delivery and return flow calculations:** The portion of available Pilot Project augmentation station headgate delivery that is not credited as consumptive use will first be allocated to irrigation season tailwater and irrigation season lagged deep percolation return flow maintenance owed that day. The remaining available Pilot Project augmentation station headgate delivery, less transit losses to the Arkansas River, will be available for exchange to Pueblo Reservoir. The available Pilot Project augmentation station headgate delivery will be calculated as the farm headgate delivery (share diversions minus 16.5% for ditch loss) minus lateral loss of 3.5%. Consumptive use is calculated as the available Pilot Project augmentation station headgate delivery, calculated as described above, multiplied by the composite consumptive use factor. Return flows are equal to the available Pilot Project augmentation station headgate delivery, calculated as described above, minus the consumptive use. Tailwater return flow is the return flow multiplied by 20%, and deep percolation return flow is the return flow multiplied by 80%. Condition of approval no. 10 further discusses deep percolation return flows. CS-U shall dedicate reusable water from any of its available sources identified in the application to replace all lagged return flows in any given year to the extent that return flow obligations cannot be met by augmentation station deliveries or releases of return flows previously exchanged to upstream storage.
8. **Volumetric Limits:** The monthly and annual consumptive use will be limited to the following maximum values (Table C) which are the averages of the three greatest months for each month and three greatest years of the study period, consistent with the Criteria and Guidelines. The values in the table will be multiplied by the ratio of the number of shares fallowed for each farm during a Plan Year divided by the total number of shares included in the Pilot Project for each farm, (not including shares leased from the Colorado Division of Parks and Wildlife (CPW) since the consumptive use for CPW shares is not included in the below table). Once any of the monthly or annual volumetric limits, has been met, all water available to the Subject Shares will be delivered through the augmentation stations on the Catlin Canal with no further claim of consumptive use credits or any other use until such time as use of the Subject Shares by Applicants is again allowed in accordance with the volumetric limits of this approval. These volumetric limits shall be modified at the time of any removal of shares and parcels from the Project consistent with condition 45.

Table C. Monthly and Annual Consumptive Use Volumetric Limits (acre-feet)

Farm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Diamond A	0.0	0.0	141.6	178.8	264.3	455.0	456.6	474.3	272.9	212.5	149.5	0.0	1879.7
Schweizer	0.0	0.0	13.7	34.8	61.5	86.6	84.3	84.2	56.0	55.7	28.7	1.0	369.7
Mameda	0.0	0.0	25.6	35.8	37.5	44.3	46.3	45.5	32.6	27.5	13.6	2.0	261.1
Groves	0.0	0.0	30.9	50.5	55.4	73.8	76.7	72.2	53.4	38.2	20.8	3.0	347.2
Mayhoffer	0.0	0.0	2.7	6.2	11.2	15.5	15.0	15.0	10.0	10.0	5.3	4.0	67.1

9. Up to 1,000 acre-feet per year of consumptive use water generated during each of the three years of fallowing operations may be exchanged to Pueblo Reservoir for delivery to CS-U based on a limit in the contract between CS-U and Super Ditch ("Contract Limit"). Any of the 1,000 acre-feet per year of consumptive use water not exchanged to Pueblo Reservoir during a Fallowing Year because of insufficient exchange potential to Pueblo Reservoir, that is instead delivered to storage in a reservoir other than Pueblo Reservoir ("Remaining Consumptive Use Water"), may be exchanged to Pueblo Reservoir for delivery to Colorado Springs in a subsequent year. Remaining Consumptive Use Water shall count against the Contract Limit in the Fallowing Year and not against the Contract Limit for the year in which Remaining Consumptive Use Water is exchanged to Pueblo Reservoir for delivery to CS-U. In addition, no more than 3,000 acre-feet of consumptive use water generated in three years of fallowing operations will be exchanged to Pueblo Reservoir for delivery to CS-U during the term of the Pilot Project. All consumptive use water not delivered to CS-U by the conclusion of the Pilot Project will be returned to the Arkansas River with no claim of consumptive use credits or any other use.
10. **Deep percolation return flows:** Deep percolation return flows will be lagged using the URFs attached in Appendix G of the application or, for parcels included in the change of water right in Case No. 12CW94, the URFs decreed in case no. 12CW94 will be used. Return flows will be maintained via augmentation station deliveries attributable to the shares, releases of return flow water attributable to the shares that has been stored, or release of supplies available to CS-U. Return flows for the Diamond A, Schweizer, Mameda and Groves Farms are owed above the Fort Lyon Canal headgate and shall be delivered via the Timpas Creek Augmentation Station. Return flows for the Mayhoffer Farm are owed below the Fort Lyon Canal and shall be delivered via the Crooked Arroyo Augmentation Station. Transit losses will be assessed from the point of release to the confluence of the Arkansas River and Crooked Arroyo or Timpas Creek, as applicable. (see also condition 18)
11. **Schweizer Farm high groundwater**: Due to the potential for a canal induced high water table adjacent to the Schweizer Farm, and noting the potential for a steep gradient of the water table relative to the grade of the surface topography during the irrigation season, for any year that the following parcels are fallowed: 21721558 (NW Parcel, Division 2 Parcel ID 23570507), the west half of 21723766 (Pivot Parcel, Division 2 Parcel ID 23570516), 21723382 & 21711491 (South Parcels Division 2 Parcel ID's 23570520 and 23570510) a reduction in historical consumptive use due to the potential consumption of groundwater on those parcels will be applied for the shares used on those parcels. This reduction is discussed in condition no. B13. The parcels and monitoring well locations are shown on Attachment B.
12. **Fallowed parcels**: Fallowed parcels must be at least ten acres in size unless they comprise all of an existing CDSS parcel that is already less than ten acres. Parcels that represent a portion of an existing field can only be split in the same direction of historic irrigation unless a means of physical separation is approved by the CWCB based on the written determination of the

State Engineer. A physical separation must exist between any irrigated portion of a parcel and the dry-up portion. For dry-up fields left fallow or with a dry-land cover crop without permanent root system (that is, not alfalfa or pasture grass for example), the separation can be a ditch or tilled strip at least ten feet in width that prevents irrigation application from reaching the dry-up parcel. For partial fields containing deep-rooted crops such as alfalfa or pasture grass, a deep tilled separation of at least 25 feet must be maintained along with any ditches necessary to ensure no irrigation application to the dry-up portion. For any dry-up parcel that is planted with a dry-land crop (haygrazer, milo, millet, etc.), the crop should either be drilled at an angle to normal irrigation direction or a tilled strip maintained at the top of the field that clearly separates the crop from any possible irrigation source or both.

13. Dry-up of the fallowed fields will comply with the "Operating Procedures for Administration of Parcels Claimed for Augmentation Credits" of the Colorado State Engineer's Office (attached), with the exception of parcels with historically high groundwater, which must comply with condition B13. Re-irrigation of dry-up parcels with any source of water, including groundwater, shall not be allowed during a Fallow Year. No partial year dry-up shall be permitted.
14. Super Ditch will notify the Division Engineer of the status (dry land crop (must specify type), tilled and fallow, not tilled and fallow, stubble of past crop left on field, etc.) of each fallowed field in the Pilot Project by April 15 of each year of operations. See additional discussion of dry-land farming in condition no. B1.
15. Super Ditch shall monitor fallowed parcels on a periodic basis to confirm the adequacy of dry-up in conformance with the terms and conditions of this approval. Should noncompliance with the dry-up requirements be discovered, Super Ditch shall immediately notify the Division Engineer in writing and take such corrective action as is required by the Division Engineer. Fallowed parcels shall be subject to inspection by the Division Engineer who shall inform the pilot project sponsor if noncompliance is found.
16. Prior to any Pilot Project operations, Super Ditch will ensure that all participating farmers are contractually bound to provide for weed control and erosion protection for the lands removed from irrigation as a part of the Pilot Project. This will include the acknowledgement of, and agreement to comply with applicable County code noxious weed management requirements, including the Otero County Noxious Weed Management Plan, Otero County Code, Chapter 12 – Vegetation.
17. Tailwater return flow obligations shall be calculated daily and shall be replaced by delivery of the Subject Shares at the augmentation station(s). Applicants shall endeavor to replace the daily calculated amount of tailwater return flow obligation on a daily basis. Applicants shall demonstrate that all monthly tailwater return flow obligations have been replaced each month.
18. Lagged deep percolation return flow obligations shall be calculated daily and shall be replaced exclusively through: (a) delivery of the Pilot Project Catlin Canal shares at the augmentation station(s), (b) releases of return flows that were delivered through the augmentation stations and not needed that day and delivered to storage, and/or (c) other sources of water decreed for augmentation or replacement or approved for augmentation or replacement by a C.R.S. 37-92-308(4) SWSP. From March 15 through November 14 return flows will generally be replaced with deliveries to the augmentation station, although other approved sources may be used. During the irrigation season, on a monthly basis, Applicants shall demonstrate that all lagged deep percolation return flow obligations have been replaced. During November 15 to March 14, replacement of lagged deep percolation return flow obligations may be aggregated as approved by the Division Engineer in accordance with Exhibit M of the decree in Case No. 12CW94 so long as there is no injury to the Winter Water Storage Program, Colorado water rights, Conservation Storage in John Martin Reservoir or the Kansas-Colorado Arkansas River Compact.

19. The amount of consumptive use credits and return flow obligations and the disposition of consumptive use credit and return flow replacement water shall be calculated on a daily basis. Such consumptive use credits may be exchanged to Pueblo Reservoir for use by CS-U or to replace Pilot Project return flows as necessary, or step exchanged[1] to storage for such uses. Water allocated to replace deep percolation return flows and delivered through Catlin Canal augmentation stations that is in excess of the replacement requirement on a given day may be exchanged to Pueblo Reservoir to replace Pilot Project return flows as necessary, or step exchanged to storage for such uses on the day the excess return flow is delivered to the Arkansas River. Excess deep percolation return flow water exchanged to Pueblo Reservoir for this purpose shall be accounted for separately from the consumptive use water. (see also condition B12)
20. Consumptive use credits available from Pilot Project operations may only be used for the purpose requested in the application, municipal use by Colorado Springs or to replace return flows owed due to Pilot Project operation.
21. Calculations of return flows owed to the river must be updated as needed (at least monthly), based on actual past water availability and estimated future availability. If there is an under delivery of return flow water in any month this under delivery shall be made up in the subsequent month.
22. **Exchanges**: Exchange into Pueblo Reservoir may occur only when there is at least 100 cfs of outflow (inclusive of hatchery flows) from Pueblo Reservoir. Such diversions/exchanges may not cause the outflow from Pueblo Reservoir to be less than 100 cfs. In addition, exchanges will be operated as junior to the City of Pueblo's recreational in-channel diversion water right awarded in Case No. 01CW160, and as though the right is in effect 24 hours per day. Operations of this Pilot Project shall comply with the requirements of the Arkansas River Flow Management Program (the "FMP") established pursuant to the May 2004 Regional Intergovernmental Agreement among Pueblo, the City of Aurora, Colorado, acting by and through its Utility Enterprise, Southeastern, Fountain, CS-U, and Pueblo Water (the "IGA"), to the same extent that CS-U and Southeastern are required to comply with the FMP, which may result in additional limitations on the exchange of water into Pueblo Reservoir. Notwithstanding the foregoing, this term and condition does not require Super Ditch to comply with any terms and conditions in the IGA that are not specifically listed in the FMP.
23. No exchange will be operated under this Pilot Project past the Avondale gauge when flows at the USGS Gauge at Avondale are, or to the extent such exchanges will cause such flows at the Avondale Gauge to be, less than 500 cfs.
24. Any exchange of water as a part of this Pilot Project must be approved in advance by the Division Engineer after a determination that there is sufficient exchange potential to accomplish the requested exchange without injury to other water rights. Applicants must request to make an exchange through the Arkansas River Dashboard. If the Dashboard is not functioning properly, Applicants must request to make an exchange via an email to DNR_ROP@state.co.us.
25. Exchanges operated under the decree for Case No. 10CW04 will comply with all terms and conditions decreed therein. Any exchange operated in connection with this Pilot Project under Administrative Approval will comply with all relevant terms and conditions for the Pilot Project. No exchanges into Pueblo Reservoir will be operated under the exchanges decreed in Case No. 05CW96 under this Pilot Project except to the extent that CS-U has made a first use

[1] Stored in an intermediate storage location prior to final exchange to Pueblo Reservoir during periods when exchange potential does not allow to exchange directly to Pueblo Reservoir.

of the Consumptive Use Water and then exchanges fully consumable return flows from that first use or subsequent uses.

26. Applicants may operate an exchange only if there is a continuous live stream between the downstream exchange-from point and the upstream exchange-to point, and must cease operating at any time that a live stream ceases to exist in that reach.
27. The rate and volume of water diverted at the exchange-to point or stepped exchange points shall not be greater than the rate and volume of water introduced at the exchange-from point, after adjustment as necessary to account for losses (including but not limited to transit losses, seepage losses, evaporation, and evapotranspiration).
28. The rate of exchange shall be limited to the least of (1) the rate at which substitute supplies are delivered at the exchange-from point, (2) the rate at which the exchange is in priority within the relevant exchange reach, (3) the minimum rate of flow in the exchange reach that will preserve a live stream, (4) the amount of flow available at the exchange-to point, and (5) the physical capacity of the receiving structure at the exchange-to point that is legally available to Applicants.
29. Stored water derived from the Pilot Project and/or fully consumable sources available to CS-U will be used to meet the lagged historical return flow obligations associated with the fallowing of the historically irrigated lands. Transit losses on water delivered for replacement of the lagged historical return flow obligations as assessed by the Division Engineer will be included from the point of release to the confluence of the Arkansas River and Crooked Arroyo or Timpas Creek, as applicable.
30. Any return flows not met by delivery of that portion of the available headgate diversions shall be made up from some other source decreed for this use or approved for this use by a substitute water supply plan, or from the consumptive yield of shares included in the Pilot Project.
31. All diversions shall be measured in a manner acceptable to the Division Engineer. Super Ditch shall install and maintain measuring devices as required by the Division Engineer for operation of the Pilot Project.
32. **Accounting**: Accounting of water in this Pilot Project must be provided to the Division Engineer on forms and at times acceptable to him or her. Said accounting must be received by the 10th of the month following the month being reported.
33. The accounting will use the amounts described in this Determination to calculate consumptive use volumes and return flow obligations.
34. The name, e-mail and postal addresses, and phone number of the contact person who will be responsible for the operation and accounting of the Pilot Project must be provided with the accounting forms to the Division Engineer and Water Commissioner through the email listed in condition no. 3.
35. **Fryingpan-Arkansas Project facilities:** Pueblo Reservoir, Twin Lakes Reservoir and Fountain Valley Pipeline (or Conduit) are owned and operated as part of the Fryingpan-Arkansas Project by the United States Department of the Interior, Bureau of Reclamation. Applicants shall store water in Pueblo Reservoir only so long as they have a contract with the owners of that structure, and such storage and use is within the effective time period of such contract. Any use of Fryingpan-Arkansas Project facilities by Applicants, for storage, exchange or otherwise, will occur only with the written permission of the owner of said reservoir, and will be made consistent with such policies, procedures, contracts, charges, and terms as may lawfully be determined by the U.S. Bureau of Reclamation or its successors in interest, in their good faith discretion. Any approval of the Pilot Project will not give Applicants any rights to use of Fryingpan-Arkansas Project structures, including Pueblo Reservoir, but will not alter any

existing rights Applicants may have of any use of the Fryingpan-Arkansas Project facilities. Applicants shall not operate the Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project. Applicants will operate the Pilot Project in a manner consistent with the LAVWCD's subcontract with Southeastern for excess capacity storage in Pueblo Reservoir. Prior to storing water in Pueblo Reservoir pursuant to a subcontract between Southeastern and LAVWCD, or any other excess capacity storage participant, Applicants shall obtain an assignment of all or any appropriate portion of that subcontract, approval of which will not be unreasonably withheld by Southeastern.

36. Applicants acknowledge that any Pilot Project approval does not give Applicants any rights to ownership or use of any Fryingpan-Arkansas Project structure, or any rights of ownership or rights to purchase or receive allocation of Fryingpan-Arkansas Project water, and does not alter any existing rights (including any right to renew existing contracts) Applicants may have. Applicants shall not use Fryingpan-Arkansas Project water or Project Water return flows for maintenance of return flows from irrigation use of any water rights utilized in this Pilot Project.
37. Applicants shall not operate the Pilot Project in a manner that would interfere with the lawful operation of the Fryingpan-Arkansas Project. Any water stored in Pueblo Reservoir as a part of this Pilot Project shall be beneficially used within Southeastern's district boundaries.
38. **Winter Water Storage Program:** Use of Winter Water to meet return flow obligations from the fallowing of historically irrigated lands shall be consistent with the terms and conditions contained in the Winter Water Storage Program ("WWSP") decreed in Case No. 84CW179 (Water Div. 2) and Southeastern's contract for Winter Water storage in Pueblo Reservoir. Applicants shall not operate exchanges under this Pilot Project during the WWSP storage season of November 15 through March 14. Nothing in any approval of this Pilot Project authorizes storage of Winter Water contrary to the requirements and limitations of the Decree in Case No. 84CW179 and the contract between the United States and Southeastern Colorado Water Conservancy District.
39. A portion of the water available to the Subject Shares is derived from the Catlin Canal Company's share of WWSP water in Pueblo Reservoir. During operation of the Pilot Project the portion of the Winter Water available to the Subject Shares shall be stored in Lower Arkansas Valley Water Conservancy District's excess capacity space in Pueblo Reservoir, or such other storage space that Applicants obtain all necessary approvals to utilize, and must be released to the Catlin Canal during the period of March 15 through November 14 in proportion to release of Catlin's other Winter Water and may not be booked- over to CS-U or used for replacement of winter return flows. If no excess capacity storage is available in a given year, Applicants will not have Winter Water available in Pueblo Reservoir for this Pilot Project during that year.
40. All of Applicants' Winter Water shall be delivered through the Catlin Canal during the period of March 16 through November 14, at the same time as deliveries of Winter Water are made to Catlin shareholders. Any Winter Water stored in Pueblo Reservoir under this Pilot Project will be stored pursuant to the applicable rules and regulations in effect from time to time for storage of Winter Water.
41. To the extent that the Pilot Project stores Pilot Project consumptive use water and return flow water that require delayed replacement in Pueblo Reservoir, such water may be booked over to replace return flow obligations that are owed to WWSP participant structures during the Winter Water storage period on a monthly or weekly basis, or as otherwise required by the Division Engineer, to participants in the WWSP as necessary to prevent injury to the water rights included in that Program. The Division Engineer will utilize Exhibit M of the decree in Case No. 12CW94 to determine the amount of the return flow obligation that is owed to John Martin Reservoir for changed Catlin Canal shares. The Division Engineer will be required to make

Winter Water releases from Pueblo Reservoir or other reservoirs upstream from John Martin Reservoir to deliver Winter Water to John Martin Reservoir, or to water users downstream of the confluence of the Arkansas River and Crooked Arroyo or Timpas Creek, as applicable. Applicants will pay the assessed transit loss for delivery of such water.

42. Prior to operation of the Pilot Project, Applicants shall submit proof to the Division Engineer, with distribution consistent with condition no. 3, that all agreements and approvals necessary for the operation of the Pilot Project have been obtained.

43. **Projection:** Prior to March 1 of each Plan Year, Applicants shall prepare and submit to the Division Engineer a monthly projection for the replacement of surface and lagged return flow obligations owed for deliveries to date and projected for the upcoming Plan Year and for total future monthly obligations over the lagged return flow period. The projection of lagged return flows shall be compared to the dry-year yields in Table 9, Colorado Springs Supplies for Return Flow Replacement, included with the Applicants' memorandum regarding the CS-U/Super Ditch Pilot Project Revised HCU Analysis submitted November 27, 2019. If the Division Engineer determines that such source(s) is(are) inadequate or otherwise unavailable to meet return flow obligations owed for the upcoming plan year, the Division Engineer may require Applicants to dedicate an acceptable firm source of water prior to commencement of operations for that Plan Year. The Applicants' projection shall also include information regarding Applicants' anticipated method(s) and source(s) of water anticipated to be used to meet return flow obligations beyond the upcoming Plan Year such that the Division Engineer can evaluate the likelihood that Applicants will continue to be able to meet return flow obligations in upcoming years and to take such action(s) as may be necessary to proactively address potential shortfalls in meeting long-term return flow obligations. This projection shall be submitted and made publicly available as described in condition no. 3.

44. **Annual Report:** Applicants shall prepare a report of Pilot Project operations on or before January 15 of each Plan Year. Such report must be submitted and posted consistent with condition no. 3. The report will reflect a reporting year of November 16 of the prior Plan Year through November 15 of the current Plan Year for which the report is being prepared.

    For Fallowing Years, the annual report will present: (a) a summary of Plan Year accounting, including the total amount of acres and Subject Shares fallowed, Plan Year deliveries to the Subject Shares, HCU credits generated, water exchanged to Pueblo Reservoir for use by Colorado Springs, tail water return flow obligation replaced and unreplaced, lagged return flow obligation replaced and unreplaced, sources of water used to meet lagged return flow obligation, future lagged return flow obligation and firm yield source of water that will be used to meet lagged return flow obligation; (b) any accounting errors or deficiencies discovered during the Plan Year and any accounting modifications that were made during the Plan Year or are proposed to be made for the upcoming year; (c) the number of days, if any, when there were unreplaced return flow obligations; (d) a summary of costs associated with Pilot Project operations, including lease payments made/received, operational costs, and to the extent available costs of erosion prevention and noxious weed management; (e) identification of any obstacles encountered in Pilot Project operations; and (f) any additional terms and conditions that Applicant believes may be necessary to prevent future material injury to other water rights or contract rights to water. Any proposed operational modifications shall be accompanied by such information and analysis as is necessary for the State and Division Engineer and any interested parties to evaluate the potential for injury resulting from such proposed changes.

For Plan Years that are not Fallowing Years: the report should describe that the Pilot Project was not operated, but report on return flow accounting for lagged return flows and replacements from any prior years of fallowing as applicable.

45. **Parcel removal:** Parcels fallowed in the Pilot Project may not be dried up for use in a different pilot project, Rule 14 plan, Rule 10 plan, substitute water supply plan, interruptible water supply agreement, another pilot project for the 10 years of operation of the Pilot Project. All 1,791.1 acres of the Participating Farms, as identified by Super Ditch in Figure 1 above, will be considered to be included in the Pilot Project until such time as the land is removed from the Pilot Project by Super Ditch. Super Ditch may remove land from the Pilot Project by submitting a report, in the manner described in condition no. 3, identifying the land to be removed from the Pilot Project to the Division Engineer on or before February 15th of each year of the 10-year term of the Pilot Project. The request should identify the parcels to be removed and provide revised volumetric limits to be used in place of those identified in condition no. 8. Until such time as the parcels are first removed from the Pilot Project, this term will disqualify parcels from being dried-up for augmentation credit under the 12CW94 decree until such time as the parcels are first removed from the Pilot Project because under paragraph 14.33 of the 12CW94 decree, land that is encumbered under a lease fallowing program may not also be claimed for dry-up under the 12CW94 decree. Once a parcel of land is removed from the Pilot Project it will no longer be able to participate in the Pilot Project. In other words, any parcel of land that is removed from the Pilot Project may not be added back in to the Pilot Project during the 10-year term of the Pilot Project. Once a parcel of land is dried-up/fallowed under the Pilot Project it may not be removed from the Pilot Project during the 10-year term of the Pilot Project.

III.B: Terms and conditions not agreed upon by parties

B1. **Dry-land farming on fallowed fields**: Whether or not Applicant must deliver to the Arkansas River an amount of water equal to the difference in soil moisture before and after a parcel was dry-land farmed.

Discussion: The practice of dry-land farming is described as a potential option for fallowed fields in the Criteria and Guidelines.

The Applicants supplied a memo on November 27, 2019 that determined the additional depletions to soil moisture that occur when (a) dry-land farming (based on winter wheat) is compared to (b) fallow ground. The results show that there is a potential for the soil moisture depletion of dry-land farming on the subject parcels to cause impacts. But the potential impacts from dry-land farming on soil moisture depletion are highly variable and would depend on several factors including climatic conditions, soil conditions prior to the dry-land farming, and if dry-land farming occurs for consecutive years.

The Division of Water Resources has not received an analysis with enough detail about potential impacts from dry-land farming to include a well-reasoned term and condition in this Determination that fits the goals of HB1248 pilot projects. DWR will conduct additional modeling analysis related to soil moisture depletion resulting from dry-land farming and the resulting impact when the field is subsequently irrigated. DWR will circulate the analysis to the parties and request comments. DWR will provide a summary of the analysis and input from the parties to CWCB prior to the January 2020 Board

Meeting. The summary may include a recommended additional term and condition for Board consideration.

B2. **URFs**: Whether lagged deep percolation factors should be calculated according to the Criteria and Guidelines, or according to the analysis in Case No. 12CW94.

Determination: The Applicant should rely on factors vetted during the Water Court process in Case No. 12CW94 where applicable for specific farms. For farms not included in Case No. 12CW94, the analysis provided by the Applicant is acceptable.

B3. Whether the Applicant should revise the URFs for the Schweizer Farm based on an alternative drain location.

Determination: Although LAWMA's position may technically have merit, the practical difference in timing is negligible and the Applicant's URF for this farm is acceptable for the Pilot Project operation.

B4. Whether the Applicant should use the URFs developed for the Mameda Farm in Case No. 12CW94.

Determination: The Applicant should rely on factors vetted during the Water Court process in Case No. 12CW94 for the Mameda Farm.

B5. Whether or not detailed terms and conditions related to controlling erosion and noxious weeds are necessary.

Determination: The State Engineer agrees with the Applicant's position on this issue, that the agreed upon terms and conditions and contracts with participating farmers are adequate and appropriate primarily due to the fact that Otero County has not asserted any issues with compliance under the 2014 HB-1248 Project under the Catlin Canal. LAWMA's comments and proposed additional conditions may be appropriate for future projects in other county areas or under different ditch systems to the extent that more restrictive requirements are desired by the county(s) in which the project will operate or by the ditch company under which the project will operate.

B6. Whether or not there must be a term and condition stating that "there shall be no renewal of this temporary lease/fallow project after the ten year term. Any continuation of this operation must first obtain Water Court approval under the resume-notice procedure."

Determination: Such a condition is not required by statute and is not necessary to prevent injury or impairment to interstate compacts. As required by statute and the Criteria and Guidelines, the CWCB Board would review any future Pilot Project proposals. Parties to this application may reach their own agreements about future project proposals.

B7. Whether or not lagged return flows must be replaced upstream of the location of the lagged return flow at all times.

Determination: Lagged return flows are to be replaced above the nearest downstream calling water right downstream of the location where return flows historically accrued. Such an operation prevents injury to vested water rights and issues with the interstate compact.

B8. Whether or not the terms and conditions clearly delineate how exchanges under 05CW96 may be used.

Determination: This issue has been clarified in condition no. 25.

B9. Whether or not Super Ditch's engineers must submit supplemental engineering related to whether the results of the LFT are consistent with 12CW94, and why any 12CW94 results are not being used.

Determination: The Criteria and Guidelines specify use of the Lease Fallow Tool with specific assumptions. As there isn't any specific injury identified by the commenting party, no additional analysis related to case no. 12CW94 is required.

B10. Whether or not a term and condition must be added stating that "Super Ditch must lease enough space in Pueblo Reservoir to assure that the requirements of the 10CW4 Decree are met, prior to exchanging water into Pueblo Reservoir."

Determination: This consideration is covered under condition nos. 25, 42, and 43.

B11. Whether or not additional terms and conditions relevant to the decree in 10CW4 must be added to address stepped exchanges.

Determination: If an exchange is operated pursuant to the allowance in 37-80-120, C.R.S., additional terms and conditions that apply to exchanges pursuant to case no. 10CW4 do not apply.

B12. Whether or not additional terms and conditions need to be added related to delivery of return flow water.

Determination: The Engineers believe condition nos. 7 and 19 delineate the distinction between Consumptive Use Credits and excess delayed return flow amounts available for exchange and later release to maintain historical return flows. Return flow water delivered through augmentation stations that is stored may not be used for any purpose other than replacing Pilot Project return flow through the Pilot Project approval. CS-U may seek separate administrative approval whereby a different source of water is physically provided to replace return flows and a like amount of stored return flow water (typically in Pueblo Reservoir) takes on the character of the water that was used to physically replace return flows.

B13. Whether additional terms and conditions need to be added to address the potential high groundwater issue.

Determination: Based on the two memos provided by the Applicants related to high groundwater on November 27, and additional water level data collected by DWR (see Attachment B), water levels on the Pilot Project lands are deeper than 8 feet below the ground surface in most cases. Based on Table D, there is little to no groundwater consumption by alfalfa and native grass to meet plant water requirements at groundwater depths of more than 8 feet. Some of the parcels on the Schweizer farm located closest to the canal, as described in condition no. 11, may have had groundwater levels that varied seasonally but were less than 8 feet at times, based on levels measured at nearby monitoring wells. Water levels on those specific parcels may have averaged about 6 feet below ground surface. Considering the crop mix evaluated by the applicant, which was 52 percent alfalfa and native grass with the balance from other more shallow rooted crops, combined with limited groundwater data, it is reasonable to assume that 15 percent of the HCU from those parcels was contributed by groundwater rather than applied surface irrigation water. If and when the applicant requests to fallow the specific parcels listed in condition no. 11, the applicant shall:

- reduce the HCU credit portion of the augmentation station deliveries for the shares attributable to those parcels by 15 percent with the balance of the augmentation station delivery considered a return flow obligation. Adjust volumetric limits accordingly. Or,
- provide additional groundwater level monitoring data relevant to those parcels to show that a different reduction or no reduction is necessary.

Table D. HCU Reductions due to Groundwater Contribution by Depth to Groundwater

Depth to Groundwater (ft)	Percent Reduction in HCU	
	Native Grass	Alfalfa
1	85	100
2	50	90
3	30	75
4	20	50
5	15	35
6	10	20
7	5	15
8	0	10

Adapted from EVAPOTRANSPIRATION AND AGRONOMIC RESPONSES IN FORMERLY IRRIGATED MOUNTAIN MEADOWS, South Park, Colorado, March 1, 1990; Revised September 1, 1991

Approvals

Approved this 6th day of December, 2019.

Kevin G. Rein, P.E.
Director, State Engineer

Attachments:

(A) Operating Procedures for Administration of Parcels Claimed for Augmentation Credit
(B) December 6, 2019 Groundwater Level Memo from Bill Tyner

Attachment A

Operating Procedures for Administration of Parcels Claimed for Augmentation Credit

Plans Approved by the Colorado State Engineer
Pursuant to the Amended Rules and Regulations Governing the Diversion and Use of Tributary Ground Water in the Arkansas River Basin, Colorado

September 2005

I. Selection and Approval of Parcels for Augmentation Credit

A. Colorado's Evaluation of Acreage

The Colorado Division of Water Resources (CDWR) has conducted several studies of irrigated lands in the Lower Arkansas Basin over a period of several decades. During the Kansas v. Colorado court case George Moravec developed mapping of irrigated acreage and assignments to ditch service areas using 1985 aerial photos for the area between Pueblo and the Kansas-Colorado stateline. Similarly, Spronk Water Engineers evaluated 1980 aerial photos for the State of Kansas and developed mapping of irrigated lands in the same area. Experts also reviewed historic aerial photos and data to assess changes in acreage during the period just prior to the Arkansas River Compact through 1980.

In 1998 and again in 2002 and 2003, the CDWR conducted studies of irrigated lands in the same areas using satellite imagery to classify irrigated and non-irrigated lands. Additionally, the CDWR has developed an ongoing data collection system to determine the lands irrigated by wells as a sole source of supply or as a supplemental source to surface water by conducting farm verification interviews each winter with farm operators in the lower basin. The work done by Colorado to identify and map irrigated lands has been critiqued by Kansas and by Colorado water right owners and ditch companies and corrected as applicable.

The Colorado State Engineer believes that the result of these studies is a comprehensive set of mapping that should be relied upon for evaluating claims for augmentation credit derived from the removal of pre-compact water rights for replacement of stream depletions caused by post-compact well pumping.

B. Nomination of Parcels for Dry-up Credits in Replacement Plans

Beginning with the 2006-07 Replacement Plan year, plan proponents will need to select parcels for dry-up credit utilizing the mapping developed by the CDWR for any dry-up credit to be claimed under the provisions of Rule 6 of the Amended Rules and Regulations Governing the Diversion and Use of Tributary Ground Water in the Arkansas River Basin, Colorado (Amended Use Rules). The CDWR mapping will include areas shown as irrigated in either the 1985 aerial photos evaluated by Colorado or the 1980 aerial photos evaluated by Kansas. Parcels identified within this mapped area that have not had shares moved to different locations will be eligible for dry-up crediting under Rule 6 provisions.

Mapped parcels shall be provided in GIS format compatible with the ArcView software used by the CDWR unless provisions are made to coordinate mapping with the Division 2 Office in Pueblo. Mapping for nominated parcels must be provided with the March 1, 2006 Replacement Plan submittals in order to ensure timely approval of replacement sources for the 2006-07 Plan Year and by March 1st of each succeeding plan year.

Example of CDWR Mapping

Plan proponents seeking to nominate any lands they believe were historically irrigated that do not lie within the mapped irrigated lands developed by the CDWR must seek a change of water right for the associated shares in Division 2 Water Court prior to approval in any plan approved pursuant to the Amended Use Rules.

C. Minimum Standards for Parcel Selection

Dry-up parcels must be at least five acres unless they comprise all of an existing DWR parcel that is already less than five acres. Parcels that represent a portion of an existing field can only be split with the direction of historic irrigation unless a means of physical separation is approved by the Division Engineer. A physical separation must exist between any irrigated portion of a parcel and the dry-up portion unless prior approval by the Division Engineer's Office is received. Waiver of the physical separation criteria will only occur for areas adjacent to sprinkler or drip systems and not for flood and furrow irrigation. For dry-up fields left fallow or with a dryland cover crop without permanent root system (that is, not alfalfa or pasture grass

for example), the separation can be a ditch or tilled strip at least ten feet in width that prevents irrigation application from reaching the dry-up parcel. For partial fields containing deep- rooted crops such as alfalfa or pasture grass a deep tilled separation of at least 25 feet must be maintained along with any ditches necessary to ensure no irrigation application to the dry-up portion. For any dry-up parcel that is planted with a dryland crop (haygrazer, milo, millet, etc.), the crop should either be drilled at an angle to normal irrigation direction or a tilled strip maintained at the top of the field that clearly separates the crop from any possible irrigation source (preferably both).

Example of Physical Separation Between Irrigated Parcel and Dry-up Parcel

Example of Tilled Strip at Dry-up Parcel Header for Dryland Crop

D. Dry-up Parcels Irrigated by Sole Source Wells

For any parcel from which surface water has been removed and claimed for augmentation credit, but which will be irrigated by a sole source well (e.g. drip systems or sprinkler systems or sole source flood), the following information must be provided with each March 1st Plan submittal:

1. Well ID Number(s) serving the parcel
2. Method of irrigation (Drip, Sprinkler, Flood, Etc.)
3. Description of how parcel will be separated from surface water irrigation and storm runoff from areas adjacent to the parcel
    a) Removal of header ditch
    b) Plug in header ditch or in feeder from surface water lateral
    c) Other method (describe)

E. Parcels Formerly Containing Alfalfa or Alfalfa-Grass Stands

Beginning with the 2006-07 Replacement Plan Year parcels containing alfalfa or mixed alfalfa stands must be deep tilled or chemically killed by no later than April 1st of each Plan Year unless the CDWR field staff have inspected the parcel and the Division Engineer has agreed that the alfalfa stand will not produce any significant growth due to either precipitation or sub-irrigation. Notwithstanding these provisions, for any parcel that exhibits sustained growth (i.e. plant growth to a height of more than 6 inches) during the dry-up year, the CDWR field staff shall require either immediate chemical kill or deep tillage or shall deem the parcel to be disqualified for augmentation credit.

F. Parcels with Areas of High Ground Water or Seepage

Fields containing areas of high ground water or areas effected by seepage from ditches or natural water courses, ponds or reservoirs may be disqualified or required to be chemically

killed or deep tilled if significant crop growth continues to occur during the irrigation season absent irrigation supply.

G. Plan Year and H-I Model Year Dry-up Claims

Due to the conflict between Replacement Plan years (April 1st through March 31st) and H-I Modeling periods (January 1st through December 31st), replacement plan proponents shall indicate whether a dry-up claim is for the Plan Year of calendar year. For any dry-up parcel irrigated during the period January through March of any year, but nominated for dry-up credit after April 1st (e.g. winter wheat), the plan proponent must provided a consumptive use analysis consistent with the methodology used for H-I Model crediting prepared by a registered professional engineer to determine how to pro-rate the dry-up acreage for the partial H-I Model year. This analysis must be submitted by no later than May 1st of the year in which the partial credit is being claimed. An estimate of the reduction in consumptive credit to be used in the Replacement Plan shall be provided with the March 1st plan submittal for purposes of plan evaluation and approval.

H. Mapping by Division of Water Resources for Approved Parcels

Using GIS data provided by the plan proponents, Division 2 staff will prepare dry-up shapefiles and mapping of the parcels approved in the replacement plan. This data and mapping will be used by CDWR field staff and Kansas to monitor dry-up fields. Division 2 staff will attempt to make this mapping available by April 15th of each year. Final mapping for dry-up affidavits will be produced at the conclusion of the credit period (January 15th for calendar year dry-up and April 15th for replacement year dry-up).

II. Parcel Identification

A. Parcel Identification

Parcels shall normally be identified using the Parcel ID established by CDWR unless another parcel identification system is approved by the Division Engineer. Mapping of approved parcels and data collection by CDWR field staff while monitoring parcels will rely on the Parcel ID to relate parcel information. The typical Parcel ID is in the format Township Number, Range Number, Section Number and a two-digit field number (e.g. 21573607).

B. Physical Identification of Dry-up Parcels

1. Permanent Dry-up Parcels

For parcels that have been approved for dry-up for at least three consecutive years, or that are intended for permanent removal of all types of irrigation, a sign shall be placed in a prominent location near the most logical point of observation near a public road way or the commonly used access point to the parcel. The sign shall be securely mounted on a 4” x 4” or 6” by 6” timber post and shall be at least 9” wide by 12” high, made of durable material, and with minimum 1” lettering. Signs shall state “Dry-Up Parcel ID XXXXXXXX”.

2. Temporary Dry-up Parcels

For parcels that are nominated for only temporary dry-up (less than three consecutive years), a sign shall be placed in a prominent location near the most logical point of observation near a public road way or the commonly used access point to the parcel. The sign shall be securely mounted on a steel tee-post or 4” x 4” or 6” by 6” timber post and shall be at least 12” wide by 6” high, made of durable material, and with minimum 1” lettering.

Signs shall state:

"Dry-Up Parcel ID XXXXXXXX" **"No Irrigation"**

or

"Dry-Up Parcel ID XXXXXXXX" **"Irrigated by Well ID XXXXXXX"**

3. Installation of Signs

Signs shall be installed by no later than April 1st of each year and signs on permanent dry-up fields shall be inspected for damage and possible replacement by April 1st of each year. Mapping showing sign locations or GPS locations of signs shall be provided by no later than April 15th of each year.

III. Field Monitoring of Dry-up Parcels

A. Colorado Division of Water Resources' Role

Division of Water Resources field staff shall visit dry-up parcels on a periodic basis during each irrigation season to determine adequacy of dry-up provisions and sources of irrigation supply for parcels that have ongoing irrigation by sole source wells. Data will be collected for each parcel as shown on the attached field inspection form. Data collected will be maintained in the Division 2 Office and periodically provided to Kansas and interested parties upon request. Problems discovered during the periodic inspections will be communicated to the designated person for each plan so that the problem can be resolved or credits forfeited for the specific parcel.

Dryup Field Verification Form

Date:_____ Verified By:_____

Arrival Time	DWR Parcel ID	Plan Parcel ID	Cover Vegetation Type	General Observations
GPS Point		View Type	Photo Comment	
Arrival Time	DWR Parcel ID	Plan Parcel ID	Cover Vegetation Type	General Observations
GPS Point		View Type	Photo Comment	
Arrival Time	DWR Parcel ID	Plan Parcel ID	Cover Vegetation Type	General Observations
GPS Point		View Type	Photo Comment	

Shares attributable to any parcel deemed by the Division Engineer as not actually being in a dried up condition shall be immediately removed from computations of augmentation credits.

The CDWR personnel will also conduct joint field inspections as requested with personnel from Kansas and will coordinate on communication about problems with any dry-up parcels that will affect the H-I Model input data.

B. Role of Plan Proponent and Well Owners

Each replacement plan shall designate with the March 1st Plan Application a contact person or person(s) for communications related to dry-up parcels. The contact person shall be responsible for ensuring that all mapping, signage and owner information is provided as described above. The contact person will also be responsible for contacting any owners for parcels with restricted access to arrange periodic field inspections and will be available to participate on field inspections by CDWR field staff upon request. The contact person will be responsible for communicating with owners of tracts where problems with dry-up conditions have been encountered to correct dry-up deficiencies. The plan proponent contact will also be responsible for ensuring that all dry-up affidavits are submitted in a timely manner and with complete documentation as may be required by plan approval conditions.

Owners of dry-up parcels will be responsible for notifying CDWR when any spill or irrigation occurs on a parcel that may disqualify the parcel or portions thereof from dry-up crediting. Timely notification will facilitate remediation activities that may preserve most dry-up credit for a parcel. When required by CDWR staff to take corrective actions on a

parcel the owner or contact person will prepare a report to document actions taken and submit the report to the Division 2 Office within ten days of remediation activities.

C. Resolution of Problems with Tracts

When a problem is discovered on a tract the Division Engineer or designated representative will determine whether an acreage reduction or consumptive use reduction is necessary. For parcels where dry-up has been unobtainable for the majority of a season on a discreet portion of a parcel an acreage deduction will be made for the dry-up crediting to eliminate that portion.

For parcels that experience continued growth of permanent vegetation, such as alfalfa, despite efforts to chemically kill or deep till the parcel, partial dry-up credit will only be considered if a consumptive use analysis prepared as described in Paragraph I-G above is submitted with the dry-up affidavit.

D. Dry-up Affidavits

At the conclusion of each dry-up period (either April through December or April through the following March), an affidavit shall be submitted signed by a person having knowledge of the dry-up activities and historic irrigation of the parcel. An example of the dry-up affidavit is attached. Affidavits will normally be due by January 15th for April through December dry-up or by April 15th for April through March dry-up.

Affidavits for each plan shall be submitted with a summary tabulation indicating for each parcel whether the claim is made for full credit, partial credit or whether the tract was irrigated by a sole source well. Summary tabulations shall total the claimed acreage by category under each ditch.

Affidavit of _____

(Name of individual having personal knowledge of dry up)

State of Colorado)
) SS.
County of Otero)

I _____, being sworn, state as follows:
Name

1. I am _____ (describe the position that you are in or the circumstance, which allows you to have a personal knowledge of the dry up of the parcel of land described in paragraph 3 below).

2. I reside at _____.
Address (Street/P.O., City, State ZIP)

3. The parcels of land shown on the attached map in the dried up acreage section of the Arkansas River Replacement Plan Application for *CWPDA* was irrigated by water from the Holbrook Canal prior to the dry up of the land for augmentation credit.

4. Based on my personal knowledge, the parcels of land shown on the attached map and described in the dried up acreage section of the Arkansas River Replacement Plan Application for *CWPDA* was not irrigated from the Holbrook Canal or from any other water source in 2003.

Further, the affiant sayeth not.

_____
Signature
Name _____
Address _____
_____
of Affiant

Subscribed and sworn to before me on _____.
Date

My commission expires _____.
NOTARY PUBLIC

_____
Signature
Name _____
Address _____
_____

COLORADO
Division of Water Resources
Department of Natural Resources

MEMORANDUM

To: Kevin Rein, State Engineer

From: Tracy Kosloff, Deputy State Engineer
Bill Tyner, Division Engineer, Division 2
Janet Dash, Data Analyst/Researcher
Rachel Zancanella, Assistant Division Engineer, Division 2
Lori Lest, Assistant Division Engineer, Division 2

Date: December 6, 2019

Subject: Evaluation of High groundwater - Potential Impact to Historical Consumptive Use Analysis for Super Ditch HB-1248 Project 2019

Craig Lis and Marshall Haworth of Martin & Wood provided a memorandum entitled "Memo - Schweizer Farm Groundwater Levels" dated November 25, 2019 as responsive material associated with the Joint Conference Report for the above project provided by Megan Gutwein on November 21, 2019. Craig Lis and Krystle Ervin of Martin & Wood also provided a memorandum entitled "Memo - Groundwater Levels - All Farms" dated November 25, 2019 as responsive material associated with the Joint Conference Report.

We have reviewed the Martin & Wood memos and also reviewed groundwater level data maintained by Division 2, but not yet published on the CDSS or DWR websites as well as additional published USGS data. Janet Dash compiled the relevant data and prepared the three maps attached to this memo that illustrate the locations of the wells in reference to most of the Super Ditch farm parcels and in particular related to the Schweizer farm parcels. Attachment B1 shows the mapped area of four of the farms (not including the Mayhoffer Farm) with relevant location information for the USGS and Division 2 network wells where depth to groundwater data has been maintained. Attachment B2 shows a more detailed view of the Schweizer Farm. Attachment B3 shows a graph of depth to groundwater measurements for the wells evaluated. Attachment B4 shows a map of irrigation well locations on the Diamond A Farm from which some additional depth to groundwater data was identified from historical well measurement tests.

Our review of the Martin & Wood memos and other relevant data concludes the following with respect to the Super Ditch HB-1248 Project:

1. Available data appears to confirm the conclusions made by Martin & Woods with respect to the Mayhoffer Farm, Mameda Farm and Groves Farm; namely that the depth to groundwater for each of these farms appears to be well below 8 feet below ground surface and no influence from high groundwater or subirrigation is likely to have occurred on these farms.
2. There were no relevant wells with historical depth to groundwater data directly on the Diamond A Farm as cited in the Martin & Wood memo. USGS well 380502103470200 is located less than a half mile east of the southeasternmost Diamond A Farm parcels. The data from this

well indicates a median depth to groundwater of 19.1 feet below ground surface with none of the 20 historical measurements of depth below 8 feet below ground surface. An irrigation well with WDID 1705228 from the Division 2 well network is located about a mile west-northwest of the western parcels on the Diamond A Farm. The median depth below ground surface to groundwater for the observations made at this well was 7.11 feet and were relatively static with almost all measurements recorded as 8 feet below ground surface or less (29 out of 30). Additional data was evaluated using well tests done for wells on or near the Diamond A Farm as shown in Attachment B4. Wells tests done between 1992 and 2003 to obtain a power conversion coefficient (PCC), contained pumping water levels and, in some cases, static water levels. For the wells shown on Attachment B4, there were 26 observations of depth to groundwater. Most of these observations were pumping water levels (23). The median depth to static water level from the three observations was 11.6 feet below ground surface. The median of the pumping water levels was 31 feet below ground surface. The additional data appears to confirm the Applicant's engineering analysis that the Diamond A Farm does not appear to have had any significant high groundwater issues or subirrigation.

3. With respect to the Schweizer Farm, our analysis indicated concerns about subirrigation on the farm as did the Martin & Wood memo. Two wells shown on Attachment B2 (USGS Wells 380457103484600 and 380452103484300) are on Schweizer Farm parcels at the northwest part of the farm. The depth to groundwater observations from these two wells indicated the median depth was 3.9 feet below ground surface from 13 observations between 2007 and 2018 for well 380457103484600 and was 8.6 feet below ground surface from 80 observations between 1965 and 2018 for well 380452103484300. This data raises concerns related to the historical consumptive use that may have been met by subirrigation and also concerns about the ability to properly dry up the parcel areas closest to the Catlin Canal. A recommended 15% reduction in historical consumptive use would seem reasonable based on the groundwater level data considered. Applying this reduction to the Martin & Wood analysis would result in the following factors and limits for the Schweizer Farm:

Historical Delayed Return Flow Remaining to the Steam after Diversions have Ceased											
Average	3.5	13.4	33	52.4	47.8	41.5	25.2	19.5	7.6	0	243.9
Maximum	15.7	40.6	59.5	72.2	69.9	66.1	49.6	53.2	25.8	0	322.4
Max3	11.6	29	52.2	69.4	67.4	62.2	47.6	47.3	24.4	0	314.2

On-Farm Depletion and RF Factors: Average Monthly Depletions and Returns at Farm as a percent of Average Monthly Farm Headgate Delivery									
Depletions	7.0%	16.0%	33.0%	43.0%	44.0%	44.0%	41.0%	31.0%	22.0%
TW Returns	18.6%	16.8%	13.4%	11.4%	11.2%	11.2%	11.8%	13.8%	15.6%
DP Returns	74.4%	67.2%	53.6%	45.6%	44.8%	44.8%	47.2%	55.2%	62.4%

B1

STATIC WATER LEVEL COMPARISONS

058.0W 057.0W 056.0W

022.0S 023.0S

1705228

380554103511600

380457103484600

380452103483400

380502103470200

1705558

HOLBROOK CANAL

CATLIN CANAL

ROCKY FORD DITCH

ROCKY FORD HIGHLINE CANAL

OTERO CANAL

CDWR STATIC WATER LEVEL SITES
ARKANSAS RIVER
ParcelID
SWL_SPRING_2019ws elev
Value
High : 4735.81
Low : 3390.63

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0 0.5 1 1.5 2
Miles

1:30,000

N W E S

Date: 12/4/2019

057.0W

022.0S

023.0S

PARCEL ID NUMBERS SCHWEIZER FARM

B2

380457103484600

380452103484300

23570507
21713459

21703539
23570518

21715641
23570516

21704397

23570542
21704370

23570521
21715259

23570509
21704369

21703540
23570510

23570520
21715258

CATLIN CANAL

23570506
21703712

OTERO CANAL

SCHWEIZER FARM PARCELS
CDWR STATIC WATER LEVEL SITES
ARKANSAS RIVER
RIVER_D2_Clip
ParcelID

SWL_SPRING_2019ws elev

Value

High : 4735.81

Low : 3390.63

057.0W

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Department of Natural Resources

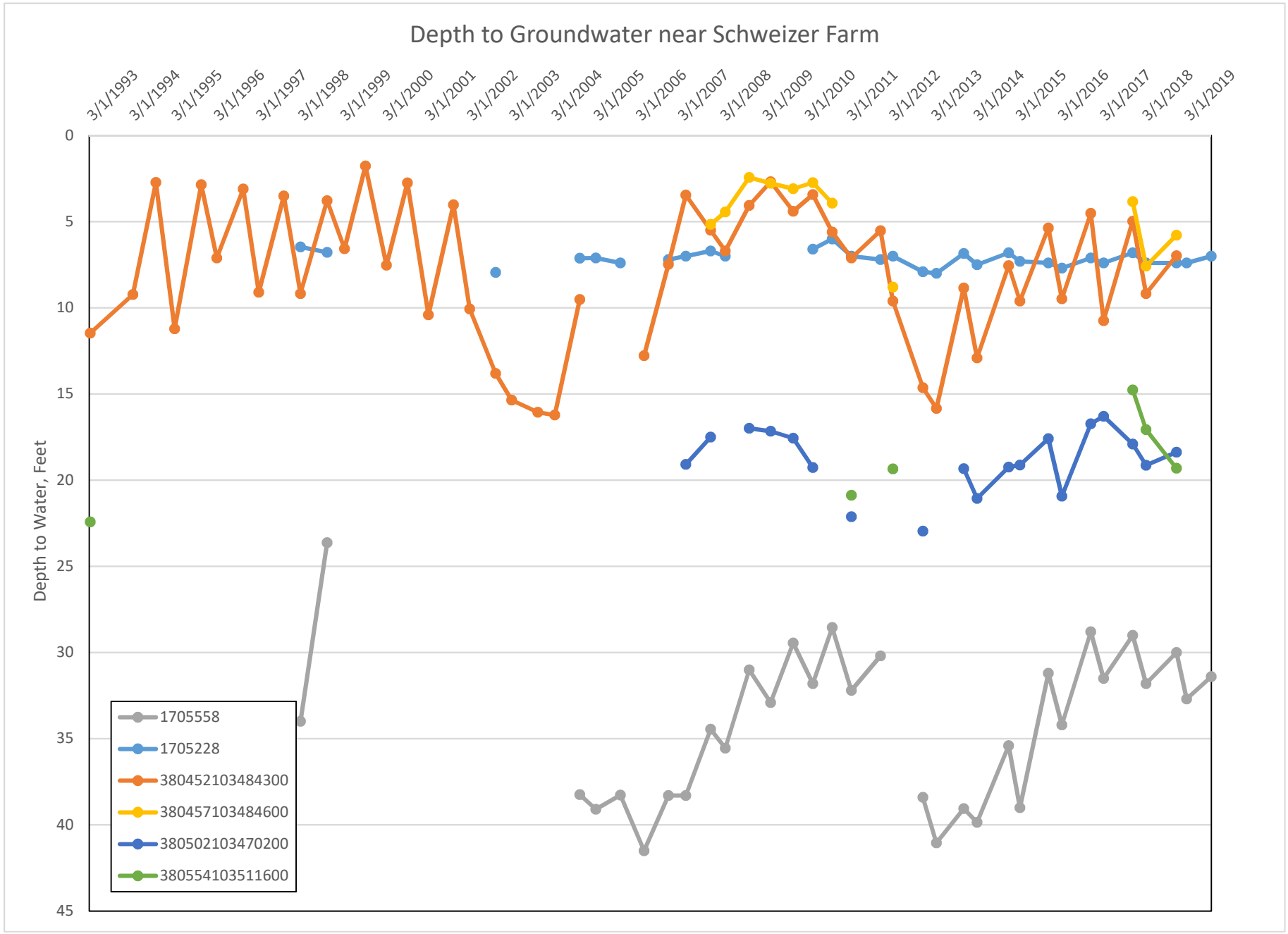
0 0.25 0.5 0.75 1
Miles

1:8,000

N W E S

Date: 12/6/2019

B3


Depth to Groundwater near Schweizer Farm
3/1/1993
3/1/1994
3/1/1995
3/1/1996
3/1/1997
3/1/1998
3/1/1999
3/1/2000
3/1/2001
3/1/2002
3/1/2003
3/1/2004
3/1/2005
3/1/2006
3/1/2007
3/1/2008
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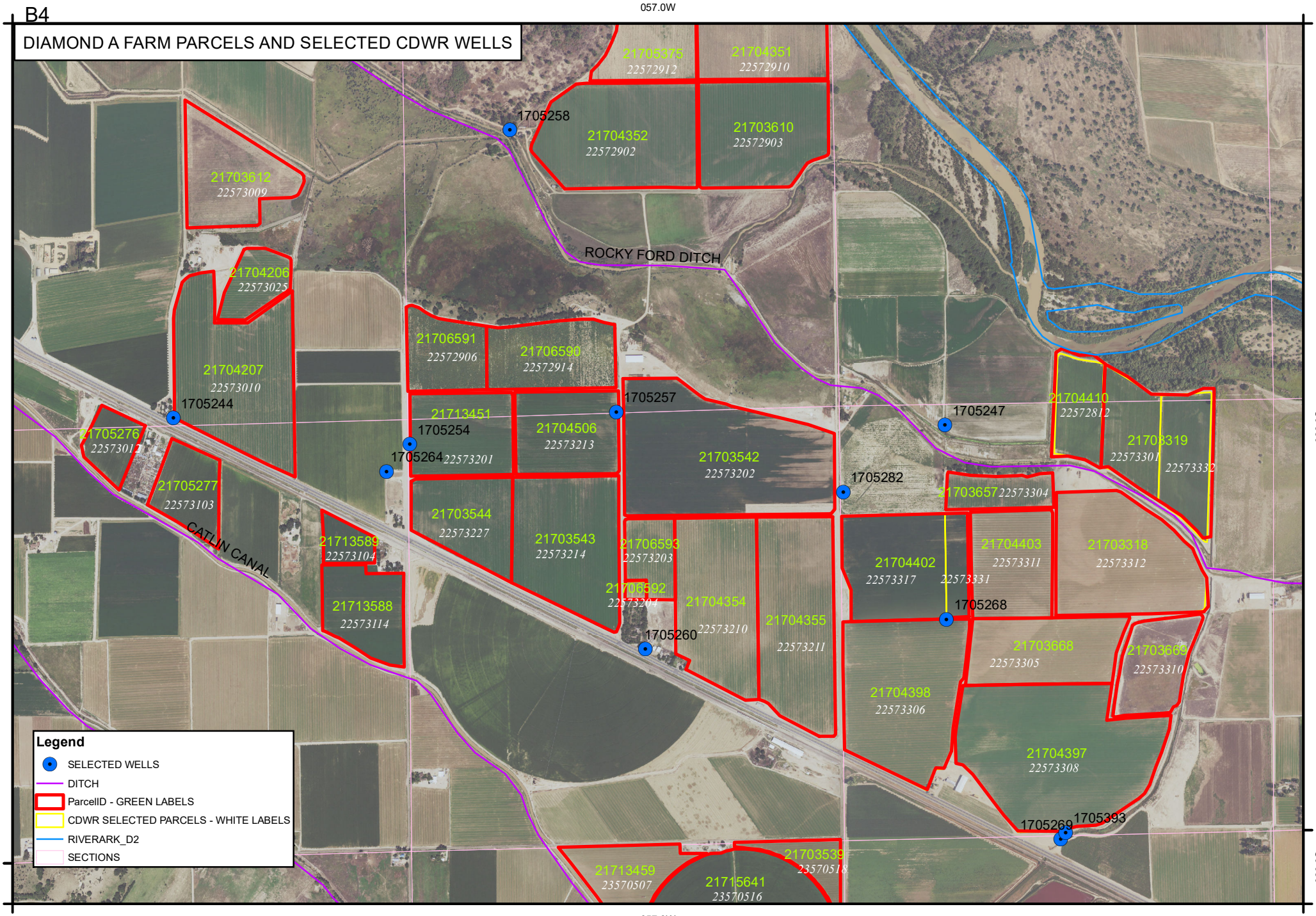
3/1/2010
3/1/2011
3/1/2012
3/1/2013
3/1/2014
3/1/2015
3/1/2016
3/1/2017
3/1/2018
3/1/2019
0
5
10
15
20
25
30
35
40
45
Depth to Water, Feet
1705558
1705228
380452103484300
380457103484600
380502103470200
380554103511600

B4

DIAMOND A FARM PARCELS AND SELECTED CDWR WELLS



Legend

- SELECTED WELLS
- DITCH
- ParcelID - GREEN LABELS
- CDWR SELECTED PARCELS - WHITE LABELS
- RIVERARK_D2
- SECTIONS

COLORADO
Division of Water Resources
Department of Natural Resources

Date: 12/6/2019

0 0.25 0.5 0.75 1
Miles

1:18,000

PROJECTION: NAD 83 UTM ZONE 13 N
BASE NAIP 2017 OTERO COUNTY