TO: Lisa Leben, Clear Creek County

FROM: Kelly DiNatale, P.E., Stephen Buechner, P.E. (DiNatale Water Consultants)

SUBJECT: Summary of Findings - Clear Creek County Plan for Augmentation – Rate Study

DATE: December 20, 2023

1. INTRODUCTION

In September 2023, Clear Creek County ("County") through its Special Projects and Water Resources Manager, Lisa Leben, contracted with DiNatale Water Consultants ("DiNatale Water") to conduct a study of the costs and revenues associated with the County's Plan for Augmentation ("Rate Study") decreed in Water Court Case No. 05CW302 ("05CW302 Aug Plan"). The 05CW302 Aug Plan was decreed in 2014 to facilitate replacement of stream depletions to Clear Creek from a variety of water uses located within Clear Creek County. Numerous water users were included in the 05CW302 Aug Plan at the time of the decree and since 2014, many others have been added to the plan as well. The costs associated with procuring the water resources and infrastructure necessary for replacement of stream depletions, acquiring a decree in Water Court and operating and maintaining the 05CW302 Aug Plan have been substantial. The County is conducting this review of the economic aspects of the 05CW302 Aug Plan to better inform decision making in setting rates for participation in the 05CW302 Aug Plan moving forward.

2. METHODOLOGY

DiNatale Water's goal in conducting the Rate Study is to provide the County with recommendations on pricing for the 05CW302 Aug Plan including the price of selling or renting augmentation water, reserving storage space in the County's reservoirs and all additional aspects of participating in the 05CW302 Aug Plan. We conducted our Rate Study

through two distinct methods. The first method involved evaluating all past expenses associated with both initiating and operating and maintaining the 05CW302 Aug Plan in order to conduct a break-even analysis of the plan pricing. The second method compared pricing from other similar plans for augmentation to evaluate the market for the resources provided by the 05CW302 Aug Plan. We then took into consideration both methodologies and provided our recommended pricing model as summarized in Section 3. Each methodology is discussed in greater detail below in Sections 2.1 and 2.2.

Throughout this summary memo, we discuss the concept of the "firm yield" of the water rights that have been decreed as sources of augmentation water in the 05CW302 Aug Plan. The firm yield of a water right can be defined as the average portion of the water right that can be beneficially used across a representative mix of hydrological circumstances. In other words, the firm yield of a water right is the approximate amount of water that is reliably available over time. As context, each water right is assigned a priority based on the date when it was first appropriated and adjudicated (the appropriation date). Junior (younger, newer) water rights are not in priority as often and can be called out by senior (older) water rights; therefore, the newer or more junior a water right is, the less likely it is to be in priority and legally available for use. Varying hydrological circumstances produce different call scenarios that dictate whether a water right is in or out of priority, and, therefore, a water right can be evaluated across a number of years and the average amount of water diverted under that right – the yield – can be calculated. This average provides the basis for the firm yield of a water right. We have considered the firm yields of all of the water rights dedicated to the 05CW302 Aug Plan and have summed these yields to produce a corresponding "firm yield of the 05CW302 Aug Plan." This concept of the firm yield of a plan for augmentation is important for establishing unit cost comparisons and evaluating the potential amounts of water left for sale to other potential customers.

Also throughout the memo, we use the term "umbrella augmentation plan". The 05CW302 Aug Plan granted to the County the ability to augment different types of water use at different locations throughout Clear Creek County, effectively creating an umbrella of locations and water uses that could possibly be augmented by the plan. Therefore, this plan for augmentation and others like it are sometimes referred to as "Umbrella Aug Plans."

2.1 Existing Portfolio Break-Even Analysis

Both the County and their outside legal counsel, Vranesh & Raisch LLP, provided extensive records of the financial expenditures associated with both initiating and operating the 05CW302 Aug Plan. For purposes of simplicity, we categorized the expenditures into the following categories:

- One-Time Capital Costs
  - Water Rights Acquisition
  - Water Court Adjudication Costs (Legal & Engineering)
- Ongoing, Annual Costs
  - Operation & Maintenance (O&M), which includes:
    - Annual and monthly reporting to the Division of Water Resources
    - Evaluation and review of potential inclusion of new plan participants
    - Scheduling of weekly releases of augmentation water
  - Legal and Engineering Assistance
  - County Administrative

It is important to distinguish between one-time, capital costs and ongoing, annual costs because ongoing costs must be budgeted for in perpetuity while capital costs can be assumed to be final once incurred. Additionally, the timing of the expense must be considered in order to develop a true comparison of the costs in today's dollars. Capital purchases made in prior years were made at prices that are not available today due to numerous economic factors. We considered the rate of inflation and the number of years that have passed from the time of the purchase and the present year in order to more accurately compare past purchases to today's prices and amounts.

The County owns or leases different types of assets related to providing augmentation water to the 05CW302 Aug Plan participants. The County has acquired fully consumable water delivered via the Vidler Tunnel, storage space in Guanella Reservoir, and a junior storage right in Green Lake. The County has also acquired a 40-year lease for water originating from Henderson Mine that can be renewed for an additional 40 years upon conclusion of the original term. The purchases of the Vidler Tunnel water, the Green Lake storage right and the storage space in Guanella Reservoir were one-time, capital purchases while the lease of Henderson Mine water is an annual cost. The one-time purchases all have ongoing expenses associated with the operation and maintenance of the amounts of water or space purchased as well. **Tables 1 and 2** below summarize the totals of the categories listed above along with a breakdown of the individual water sources.

Table 1. Summary of One-Time Costs

One-Time Costs				
	Purchase Amount ($)		2023 Dollars ($)	
Water Rights Acquisition				
Green Lake Water	$	1,162,000	$	2,006,000
Vidler Tunnel Water	$	1,140,000	$	2,313,000
Guanella Reservoir Storage Space	$	635,000	$	1,069,000
Water Rights Acquisition Sub-Total	**$**	**2,937,000**	**$**	**5,388,000**
Water Court Costs				
Legal	$	304,000	$	455,000
Engineering	$	311,000	$	492,000
Water Court Costs Sub-Total	**$**	**615,000**	**$**	**947,000**
Total One-Time Costs	**$**	**3,552,000**	**$**	**6,335,000**

**Water Court costs include original adjudication for Vidler Tunnel Water Rights in addition to plan for augmentation*

Table 2. Summary of Annual Costs

Ongoing Annual Costs		
	($)	
Operation and Maintenance		
Green Lake	$	12,200
Vidler Tunnel Delivery	$	11,500
Guanella Reservoir	$	2,200
Henderson Mine Lease	$	3,100
Water Rights O&M Sub-Total	**$**	**29,000**
Legal	$	38,000
Engineering	$	22,000
County Administrative	$	95,000
Total Annual Costs	**$**	**184,000**

2.1.1 Revenues Collected To Date

The County has also collected revenues from leasing out augmentation water to numerous plan participants since 1994[1]. Total water lease revenues collected from 1994 through 2023 are approximately $2,509,000. After consideration for the present value of these revenues, the County can assume to have recuperated approximately $3,652,000 in 2023 dollars. These revenues are most easily compared to the present value of the one-time costs associated with the 05CW302 Aug Plan. **Table 3** below shows the amount of costs remaining that have not yet been recuperated. This remaining amount should be considered in determining pricing for augmentation water.

Table 3. Net Amount - One-Time Costs

Net One-Time Costs		
Description	Amount (2023 Dollars)	
One-Time Costs	$	(6,335,000)
Revenues Collected	$	3,652,000
Net Amount	**$**	**(2,683,000)**

2.1.2 Unit Costs

Each of the listed costs, both one-time, capital costs and ongoing, annual costs, are associated with a specific quantity of water. The usable quantity, or yield, of the water right varies from year to year based on hydrologic conditions, stream flows, and the storage capacity available to store the water right. Additionally, some of the purchases were made for water rights while others were made for space in a reservoir that could store other water rights. Further, some of the water purchased by the County is leased on an annual basis, and the leases have expiration dates. Because of the varying nature of the different purchases, it is difficult to compare the yields of the subject purchases on a unit cost basis. Therefore, we endeavored to compare the total expenses from the 05CW302 Aug Plan to the firm yield of the 05CW302 Aug Plan, as mentioned above in Section 2. The amounts, firm yields, and long-term yields of the specific water purchases are listed in **Table 4** below.

[1] Originally, the County leased water as the Clear Creek County Water Bank until the plan for augmentation was officially decreed in 2014.

Table 4. 05CW302 Aug Plan Water Rights & Firm Yield

Water Right	Total Decreed Amount (AF)	Firm Yield (AF)
Green Lake	100	10
Vidler Tunnel Rights	71	71
Guanella Reservoir Storage Space	50	0
Henderson Mine Lease	12	0
Total	**233**	**81**

The firm yield of the 100 acre-feet ("AF") Green Lake storage right was determined to be 10 AF or one tenth of the decreed amount because the junior priority of the water right is only expected to be able to be diverted in priority one out of every ten years[2]. Estimations of the long-term firm yield of a water right should also consider any dead storage (water that is stored but unable to be released due to physical constraints with the reservoir or its pump) and evaporation and seepage that occurs on the stored water before it can be released for beneficial uses. Due to these considerations, we have estimated that the long-term firm yield of the Green Lake storage right is only one tenth of the decreed amount. Additionally, the Henderson Mine lease is not perpetual in nature and will expire in 2033. Therefore, the firm yield of the 05CW302 Aug Plan should be reduced by the 12 AF from the Henderson Mine lease.

DiNatale Water used the long-term firm yield amounts for the 05CW302 Aug Plan water rights to determine a per unit cost associated with past participation in the 05CW302 Aug Plan. We compared the sum of the present value of the one-time costs and the average annual cost to the firm yield of the 05CW302 Aug Plan to determine a per unit cost in dollars per acre-foot as shown in **Table 5** below.

Table 5. Unit Costs for Firm Yield of 05CW302 Aug Plan Water Rights

Description	Cost ($)	Amount (AF)	Unit Cost ($/AF)
One-Time Costs	$ 6,335,000	81	$ 78,200
Annual Costs	$ 184,000	81	$ 2,300
Total	**$ 6,519,000**		**$ 80,500**

We amortized the one-time unit costs over a 50-year period that assumed a 4% interest rate and found that the corresponding price per acre-foot would be $3,640/AF. Adding the

[2] The predecessor to the 05CW302 Aug Plan, the Clear Creek County Water Bank, instituted a Water Policy that assumed that the Green Lake storage rights would be in priority once every five years but additional experience in operating the 05CW302 Aug Plan has determined that to be an over-estimate of true availability.

annual costs of $2,300/AF to the amortized cost results in a total cost of $5,940/AF. This pricing would be representative of efforts to recuperate 100% of the costs associated with the establishment of the 05CW302 Aug Plan if revenues from the sale of each acre-foot of augmentation water were collected evenly. However, the 05CW302 Aug Plan has been in operation for nearly a decade and a majority of the augmentation supply has already been dedicated to plan participants. Therefore, we evaluated the unit cost pricing if the County were to aim to recuperate all remaining costs of the 05CW302 Aug Plan associated with only the remaining uncommitted balance of replacement water.

In 2023, the 05CW302 Aug Plan projected 52.4 AF of depletions requiring replacement for the 1-year period from April 2023 through March 2024, and an additional 13 AF was committed to other leased customers who are not participants of the 05CW302 Aug Plan. Comparing this amount to the long-term firm yield of the plan leaves an uncommitted balance of 15.6 AF (81 AF of long-term firm yield – 52.4 AF of depletions from current plan participants – 13 AF of depletions from non-05CW302 Aug Plan leased customers = 15.6 AF uncommitted firm yield). This uncommitted balance could be increased if additional storage space is acquired as discussed below in Section 3.1.4.

Should the County seek to recuperate the total costs through the sale or lease of the remaining, uncommitted balance of water, the unit cost would rise significantly. **Table 6** contains the pricing necessary to recuperate 100% of the total one-time costs associated with the 05CW302 Aug Plan through the sale or lease of the remaining, uncommitted balance of the long-term firm yield of the 05CW302 Aug Plan (i.e., the 15.6 AF of uncommitted augmentation water).

Table 6. Unit Costs for Uncommitted Balance of Firm Yield of 05CW302 Aug Plan Water Rights

Description	Cost ($)	Amount (AF)	Unit Cost ($/AF)
Remaining One-Time Costs	$ 2,683,000	15.6	$ 172,000

We amortized the unit costs from Table 6 with a 4% interest rate and a 50-year period and found the corresponding annual price to be $8,010/AF/year. After adding the annual costs ($2,300/AF/year), the total annual pricing for recuperating all of the remaining costs from the uncommitted balance of replacement water would be $10,310/AF/year.

The decision to recuperate some portion of the remaining costs associated with the 05CW302 Aug Plan would be a policy decision by the County. Without recuperating these costs, the County would essentially be deciding to subsidize the cost of the 05CW302 Aug Plan with tax revenues, which is a similar methodology to a water conservancy district assessing a mill levy to property owners that benefit from a plan for augmentation. If, instead, the County seeks to price the uncommitted augmentation water at a rate that would be consistent with only covering the annual costs associated with the 05CW302 Aug

Plan, a rate of $2,300/AF would be appropriate, as demonstrated in **Table 5** above. The appropriate pricing for participation in the 05CW302 Aug Plan is dependent upon the County's policy decisions.

2.1.3 Other Economic Considerations

DiNatale Water recognizes that the costs to develop a reliable replacement water supply in Colorado are significant, and even more so in the headwaters of our watersheds. Procuring water supplies for new developments in Colorado is regularly becoming more expensive. Recently, we have seen Front Range water providers charging cash-in-lieu rates of $60,000-$70,000 per single-family residential equivalent[3]. A typical single-family residential home requires delivery of approximately 0.5 AF of water per year and consumes approximately 50% of this water delivery. Therefore, typical unit costs associated with developing potable water supplies for development on the Front Range of Colorado is approximately $260,000/AF of consumptive use. These costs would rise even higher in development in the headwaters of a watershed as there are fewer alternative water supplies available for procurement, if any at all.

In order to help reduce the very high cost of individually developing a water supply or plan for augmentation, some private and county-wide plans for augmentation have been established, but the majority these plans are backed by tax revenues generated from a water conservancy district. These water conservancy districts have mill levies that, in effect, help to split the financial burden of establishing and operating a plan for augmentation amongst all the potential beneficiaries of the plan. DiNatale Water reviewed the recent budgets for some of the water conservancy districts evaluated in the following section and determined that many have enterprise funds that fund much of the cost of developing the plan for augmentation. Other water conservancy districts that do not have an enterprise fund, such as the Upper Yampa Water Conservancy District, heavily subsidize their umbrella augmentation plan through their mill levy. Without the support of tax revenues to fund the costs associated with developing and operating a plan for augmentation at the headwaters of a watershed, a plan may be forced to increase its pricing in order to simply break even on its expenses.

[3] Some water providers allow for developers to provide cash in lieu of dedicating new water supplies and have priced this amount relative to what it would cost the provider to procure the additional water supply themselves.

2.2 Umbrella Aug Plan Comparison

DiNatale Water identified multiple other Umbrella Aug Plans located in Colorado and evaluated their pricing structure for utilizing the augmentation services offered by each. We compared and contrasted Umbrella Aug Plans operated by the following groups:

- Upper Yampa Water Conservation District ("UYWCD")
- Upper Arkansas Water Conservancy District ("UAWCD")
- St. Vrain and Left Hand Water Conservancy District ("SVLHWCD")
- San Luis Valley Water Conservancy District ("SLVWCD")
- Headwater Authority of the South Platte ("HASP")

Figure 1 below indicates the service areas for each Umbrella Aug Plan across the state of Colorado. Each of the subject Umbrella Aug Plans are located in or near the headwaters of the respective watersheds in which they are located. We selected these Umbrella Aug Plans for our evaluation in part because of their location in their respective watersheds. Because these Umbrella Aug Plans are located upstream of any other replacement sources, the market for sources of water that could be used for replacement and augmentation is considerably small and so, this small market leads to higher pricing of replacement water supplies. We have described the general nature and pricing structure of each Umbrella Aug Plan in more detail below.

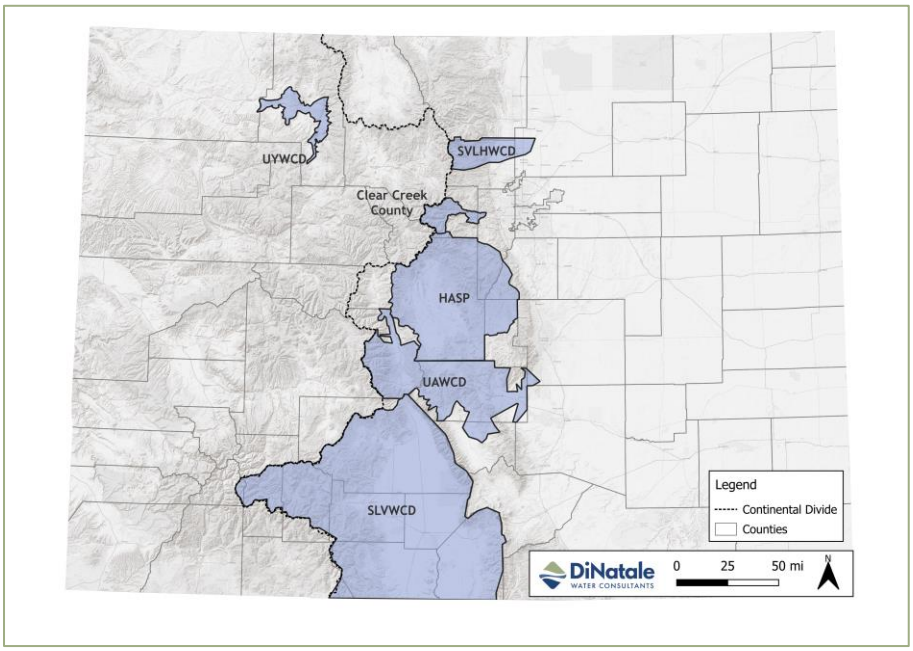

Figure 1. Umbrella Aug Plan Service Areas

2.2.1 Upper Yampa Water Conservation District

The UYWCD was formed in 1966 and is facilitated by a plan for augmentation decreed in Case No. 06CW49 in Water Division 6. The UYWCD utilizes two reservoirs (Stagecoach Reservoir and Yamcolo Reservoir) for its replacement of stream depletions of up to 2,000 AF annually. It should be noted that demand for replacement supplies in Water Division 6 (Yampa and White River Basins in Northwest Colorado) is considerably lower than demand in Water Division 1 along the Colorado Front Range. Additionally, because UYWCD is a water conservation district, it is supported by a mill levy imposed on taxpayers located within the service area and, therefore, pricing for replacement water within the UYWCD may be considerably different than pricing for non-water conservancy and water conservation districts.

The UYWCD offers annual lease pricing for replacement water and sets different rates for commercial and residential users. UYWCD does not offer a one-time payment option to purchase perpetual replacement water. UYWCD's 2023 pricing is included in **Table 7** below.

Table 7. UYWCD Pricing

	Non-Commercial / Non-Industrial		Commercial/ Industrial	
	Small Contract	Large Contract	Small Contract	Large Contract
Price (per AF)	$240.31	$240.31	$281.55	$281.55
Application Fee	$600.00	$2,000.00	$600.00	$2,000.00
Assignment Fee	$600.00	$600.00	$600.00	$600.00
Amendment Fee	$600.00	$600.00	$600.00	$600.00

Contracts are considered small if less than 30 AF

2.2.2 Upper Arkansas Water Conservancy District

The UAWCD was formed by statute in 1979 and operates an augmentation program to facilitate replacement of stream depletions to the Arkansas River caused by member well pumping or evaporation of open water surfaces. The UAWCD utilizes multiple reservoirs to store and subsequently release water for replacement of lagged stream depletions. UAWCD is a water conservancy district which has the ability to impose a mill levy on the taxpayers within its district which helps to greatly offset the cost of operating its augmentation program. UAWCD offers both annual lease pricing and one-time purchase pricing for its replacement water supplies.

Table 8. UAWCD Pricing

	Domestic Household Use	
	Annual Augmentation	Perpetual Augmentation
Price (per AF)	$1,650.00	$38,500.00
Application Fee (one-time fee)	$200.00	$200.00
Annual Storage & Maintenance Fee (per AF)	-	$1,650.00
New Well Permit Fee (one-time fee)	$100.00	$100.00
Over Pumping Fee (per gallon of exceedance)	$0.005	$0.005

Assumes 1,400 square feet of lawn or garden in addition to domestic household use

2.2.3 St. Vrain and Left Hand Water Conservancy District

SVLHWCD was formed in 1971 under the Water Conservancy Act, granting it the ability to levy taxes against property owners within the District. The SVLHWCD provides an augmentation program for water users located within the headwaters of St. Vrain Creek and Left Hand Creek and out to the confluence of St. Vrain Creek and the South Platte River. The augmentation program was decreed in Water Division 1 Court in Case No. 02CW334 in 2007. SVLHWCD uniquely decreases the price of its replacement water for higher water users (those requiring replacement of more than 1 acre-foot, annually) as a majority of its members use small amounts of water. SVLHWCD only offers annual pricing for participation in its augmentation program as tabulated below. Similar to the 05CW302 Aug Plan, the SVLHWCD must deal with potential customers depleting streams that are protected by an instream flow right and so, SVLHWCD imposes a restriction on augmenting any stream depletions located within instream flow right reaches and junior to December 23, 2002.

Table 9. SVLHWCD Pricing

	Annual Augmentation
Residential Base Fee	$273.27
Commercial Base Fee	$681.48
Admin Fee	$255.92
Tier 1 Use Fee (per AF)	$368.21
Tier 2 Use Fee (per AF)	$286.75

Tier 1 Usage < 1 AF, annually

2.2.4 San Luis Valley Water Conservancy District

The SLVWCD is located in Water Division 3 at the headwaters of the Rio Grande River. It was formed in 1949 pursuant to the Water Conservancy Act and provides stream augmentation for domestic, commercial and municipal wells located within its service area. Similar to the 05CW302 Aug Plan, the SLVWCD utilizes transmountain water rights for replacement of stream depletions within the District. The SLVWCD offers both annual and one-time pricing for participation in its augmentation program. **Table 10** below details the pricing.

Table 10. SLVWCD Pricing

	Annual Augmentation	Perpetual Augmentation
Price (per AF)	$2,000.00	$20,000.00
Augmentation Certificate Fee (one-time fee)	$400.00	$400.00
Petition to Include Land in District (one-time fee)	$1,200.00	$1,200.00
Annual Assessments - Residential	$175.00	$175.00
Annual Assessments - Commercial < 1 AF	$400.00	$400.00
Annual Assessments - Commercial > 1 AF	$300.00 + ($250.00/AF)	$300.00 + ($250.00/AF)

Additional charges assessed for use of recharge ponds and to cover transit and ditch losses

2.2.5 Headwater Authority of the South Platte

The Headwater Authority of the South Platte ("HASP") was originally formed by a joint effort from the Upper South Platte Water Conservancy District and the Center of Colorado Water Conservancy District. HASP serves the headwaters of the South Platte River in Park County and portions of Teller, Douglas, Jefferson and Clear Creek Counties[4]. HASP operates a water rights enterprise that facilitates an umbrella plan for augmentation. HASP has decreed two plans for augmentation in Water Division 1 Court Case Nos. 02CW389 and 12CW50. HASP offers both a one-time fee for perpetual inclusion within the augmentation program and annual lease pricing.

[4] HASP's service area does not overlap with the 05CW302 Aug Plan service area.

Table 11. HASP Pricing 1 of 2

	Augmentation Water Purchase Price	Augmentation Water Lease Price	Application Fee*
Less than 0.029 AF Annual Depletion (flat fee)	$2,667.00	$266.70	$200.00
0.029 - 0.099 AF Annual Depletion (flat fee)	$5,000.00	$500.00	$500 + $1000
0.10 - 0.79 AF Annual Depletion (per AF)	$50,000.00	$5,000.00	$500 + $1000
0.80 - 0.99 AF Annual Depletion (flat fee)	$39,500.00	$3,950.00	$500 + $1000
1.0 AF and Above Annual Depletion (per AF)	$40,000.00	$4,000.00	$500 + $1000

**Application Fee for Single Family Residential is $200, all others is $500 plus $1,000 retainer*

It should be noted that the inclusion of the $1,000 retainer for all applicants that are not single-family residential water users was designed to cover the costs associated with relying on outside legal and engineering consultants. This retainer is merely an initial payment amount and may include additional supplemental fees necessary to cover the legal and engineering costs. **Table 12** below includes pricing information for HASP's annual fees as the amount varies on a different volumetric basis than the application fees and augmentation water pricing included above in **Table 11**.

Table 12. HASP Pricing 2 of 2

	Annual Fee
Less than 0.029 AF Annual Depletion (flat fee)	$230.00
0.029 - 0.33 AF Annual Depletion (flat fee)	$287.50
0.34 - 0.50 AF Annual Depletion (flat fee)	$402.50
0.51 - 1.0 AF Annual Depletion (flat fee)	$690.00
1.01 - 5.0 AF Annual Depletion (flat fee)	$1,092.50
5.01 - 10.0 AF Annual Depletion (flat fee)	$1,610.00
More than 10.0 AF Annual Depletion (flat fee)*	TBD

**To be determined at time of application*

HASP also imposes a Storage Vessel Fee of up to $5,000 annually for those customers that require utilization of a storage vessel consistent with the decree entered in Case No. 12CW50.

2.3 Umbrella Augmentation Plan Conclusions and Comparisons

In order to properly compare the pricing structures implemented by the various Umbrella Aug Plans, DiNatale Water compared the costs associated with procuring 1 AF of replacement water, annually, and requiring the use of storage space. We felt that this scenario most reasonably compared to the costs incurred by participants in the 05CW302 Aug Plan as the County's plan does not offer a perpetual augmentation purchase amount

and requires storage of all replacement supplies. **Table 13** below compares the costs associated with applying for inclusion, leasing 1 AF of replacement water and utilizing storage in all of the comparable Umbrella Aug Plans, including the 05CW302 Aug Plan.

Table 13. Umbrella Aug Plan Pricing Comparison – Annual Augmentation

Umbrella Aug Plan	Application Fee* ($)	Augmentation Water Cost ($)	Total ($)
Upper Yampa WCD	$600.00	$281.55	$ 881.55
Upper Arkansas WCD	$200.00	$1,650.00	$ 1,850.00
St. Vrain Left Hand WCD	$937.40	$286.75	$ 1,224.15
San Luis Valley WCD	$2,150.00	$2,000.00	$ 4,150.00
Headwaters Authority of the S. Platte	$2,190.00	$4,000.00	$ 6,190.00
Clear Creek County 05CW302 Aug Plan†	$12,750.00	$2,500.00	$ 15,250.00

**Includes any additional base, storage or maintenance fees*

† Includes $10,000 one-time participation fee, $750 administrative fee and $2,000 application fee

Some of the comparable Umbrella Aug Plans offered participants the option of a one-time purchase of augmentation water and perpetual inclusion within the plan. The costs associated with perpetual inclusion in a plan for augmentation are understandably higher than those associated with an annual leasing option. The three plans that offered perpetual augmentation pricing increased the cost of water significantly, with increased costs ranging from 10 to 23 times the cost of annual, leased water. **Table 14** below compares the cost associated with perpetual augmentation services from other Umbrella Aug Plans.

Table 14. Umbrella Aug Plan Pricing Comparison - Perpetual Augmentation

Umbrella Aug Plan	Application Fee* ($)	Augmentation Water Cost ($)	Total ($)
Upper Arkansas WCD	$1,850.00	$38,500.00	$ 40,350.00
San Luis Valley WCD	$2,150.00	$20,000.00	$ 22,150.00
Headwaters Authority of the S. Platte	$2,190.00	$40,000.00	$ 42,190.00

**Includes any additional base, storage or maintenance fees*

3. RECOMMENDATIONS

Upon consideration of the above research and information, DiNatale Water recommends that Clear Creek County make the following adjustments to the 05CW302 Aug Plan.

3.1.1 Establish Two Distinct Pricing Tiers for Future Plan Participation

Presently, the County has 18 customers to the 05CW302 Aug Plan. 11 of these 18 customers (61%) use less than 1 AF of water per year and 15 of the 18 customers (83%) use less than 3 AF of water per year. If the County continues to charge participation fees of approximately $12,750/customer and $2,500/AF/year for leased augmentation water, the County will take in greater revenues if it increases the number of customers that utilize the remaining portion of uncommitted augmentation water. As an example, if the County added 15 new customers each using 1 AF of water per year, they would generate $190,000 of revenue in the first year and $37,500 in each year after. Conversely, if the County added one customer that uses 15 AF of water each year, they would generate $50,000 of revenue in the first year and $37,500 in each following year. **Figure 2** below depicts a heat chart of the first-year revenues generated from adding various combinations of customers at average depletion amounts to depict the difference between adding more smaller use customers from fewer larger use customers.

Total Depletions (AF)	# of New Customers									
	1	2	3	4	5	6	7	8	9	10
15.6	51,500	-	-	-	-	-	-	-	-	-
14.6	49,000	-	-	-	-	-	-	-	-	-
13.6	46,500	-	-	-	-	-	-	-	-	-
12.6	44,000	-	-	-	-	-	-	-	-	-
11.6	41,500	-	-	-	-	-	-	-	-	-
10.6	39,000	-	-	-	-	-	-	-	-	-
9.6	36,500	-	-	-	-	-	-	-	-	-
8.6	34,000	-	-	-	-	-	-	-	-	-
7.6	31,500	44,000	-	-	-	-	-	-	-	-
6.6	29,000	41,500	-	-	-	-	-	-	-	-
5.6	26,500	39,000	-	-	-	-	-	-	-	-
4.6	24,000	36,500	49,000	-	-	-	-	-	-	-
3.6	21,500	34,000	46,500	59,000	-	-	-	-	-	-
2.6	19,000	31,500	44,000	56,500	69,000	81,500	-	-	-	-
1.6	16,500	29,000	41,500	54,000	66,500	79,000	91,500	104,000	116,500	-
0.6	14,000	26,500	39,000	51,500	64,000	76,500	89,000	101,500	114,000	126,500

Figure 2. First-Year Revenues Heat Chart

Therefore, the County should charge a higher rate for augmentation water for plan participants that require more augmentation water. Essentially, the participation fees act as a capital recovery mechanism that is minimized by selling more water to fewer participants, disincentivizing the County from larger water leases. DiNatale Water recommends instituting a break point for pricing water for customers using more or less than 1 AF/year.

3.1.2 Increase Price for Augmentation Water for Larger Water Users

DiNatale Water recommends maintaining a price for augmentation water of $2,500/AF/year for customers using less than 1 AF/year but increasing the cost of replacement water for customers using more than 1 AF/year to $3,750/AF. Other Umbrella Aug Plans charge a similar rate for augmentation water and this rate would be well within a reasonable range of rates for augmentation water supplies. Assuming a 4% interest rate and a duration of participation in the 05CW302 Aug Plan of 50 years, this annual pricing would correspond to a one-time purchase price of approximately $80,500/AF, which represents the unit cost associated with the total costs of adjudicating and operating the 05CW302 Aug Plan (**Table 5**).

Figure 3 below shows the portion of the 2023 consumptive use covered by the 05CW302 Aug Plan for customers using both more and less than 1 AF/year. Approximately 89% of the total plan obligations came from customers using more than 1 AF/year despite 61% of the total number of customers using less than 1 AF/year of water.

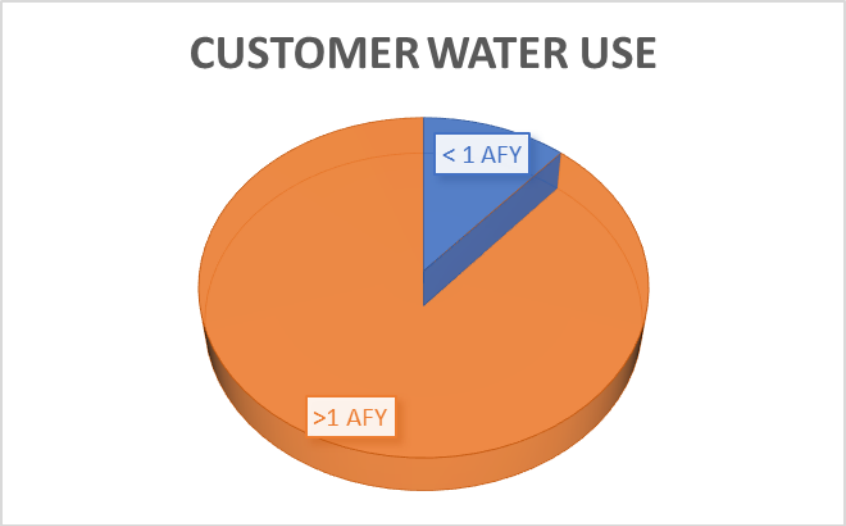

Figure 3. Small and Large Water Users in 05CW302 Aug Plan

Because the majority of the augmentation water currently committed to 05CW302 Aug Plan customers comes from large water users, the capital recovery aspects of the 05CW302 Aug Plan pricing (participation fee, application fee) that are assessed on a per customer basis, are in effect, reduced below what they would have been if the same amount of augmentation water was sold to more customers. By increasing the cost of augmentation water for water users that use more than 1 AF of water per year, the County would be recovering more of the capital costs from the initial establishment of the 05CW302 Aug Plan. Again, implementing these recommendations is dependent upon policy decisions made at the sole discretion of the County. If the County were to decide to recover more of the remaining capital costs, the price of the augmentation water could be raised even

higher. As spelled out in Section 2.1.2 above, the effective augmentation water pricing ranged from $2,300/AF to $10,310/AF dependent upon how much of the remaining capital costs were intended to be recovered by the lease of the uncommitted augmentation water.

3.1.3 Charge a Storage Reservation Fee

We propose that the County charge an additional fee for reservation of replacement water. In some instances, a customer may wish to reserve replacement water in a coming year, but may not end up needing the entire amount of reserved replacements due to unforeseen circumstances such as a change in the expected downstream river call. Charging a storage reservation fee will help to properly reflect the cost of keeping water in storage that is eventually not needed. This fee is necessary because often, the County cannot acquire additional supplies or fully utilize the supplies they've already purchased because their storage space is full. This limits the County's ability to sell this water to other buyers or potential new augmentation plan participants. In comparable circumstances downstream on the South Platte River, plans for augmentation are required to demonstrate the amount of replacement supplies held in storage and cannot sell or dedicate water for replacement in excess of the amount of replacement supplies held in hand each year. The County should plan for financial stability in times of both drought and excess, and a storage reservation fee would help to stabilize forecasts of 05CW302 Aug Plan revenues.

This additional storage reservation fee could be added in lieu of a price increase for augmentation water or in addition to the price increase recommended above. Without further guidance from the County on the desired outcomes of the referenced policy decisions, DiNatale Water recommends a storage reservation fee of $250/AF. This would make the effective pricing of augmentation water equal to $2,750/AF for small water users (< 1 AF/year) and $4,000/AF for large water users (> 1 AF/year).

3.1.4 Invest in Storage Space to Firm Up Yield of Existing Replacement Supplies and Allow for Acquisition of Additional Supplies

In recent years, the County has operated its storage reservoirs well and keeps them full or near capacity through most of the water year. One positive aspect of this management is that there is sufficient replacement water available to replace all the County's obligations for more than one year. The drawback of maintaining full or near full storage reservoirs is that the County has been unable to store 100% of the replacement supplies that they have purchased because there has not been any storage space available to the County. Should the County increase the amount of storage space available to the 05CW302 Aug Plan, the firm yield of the County's replacement supplies would increase as would the amount of revenues that could be generated from future acquisitions of customers. DiNatale Water recommends that the County explore opportunities to construct any one of the reservoirs

decreed in the 05CW302 Aug Plan or partner with other entities for more efficient utilization of the Aug Plan replacement supplies.