CONNECTING WATER TO LIFE

WATER RESOURCE MASTER PLAN 2024 UPDATE

Prepared for:

Mt. Crested Butte Water & Sanitation District

Date: 2024-08-15

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The technical material in this report was prepared by or under the supervision and direction of the undersigned, whose seal as a Professional Engineer/Hydrologist is affixed below.

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SECTION 1: INTRODUCTION

In 1991, LRE Water (formerly Resource Engineering, Inc.) prepared a report that recommended and set forth a water rights plan for augmentation that was intended to provide the Mt. Crested Butte Water & Sanitation District with a dependable, year-round water supply capable of meeting existing and future demands within the District's service area. Based on this analysis, the District filed a water court application in Case No. 91CW49 that was subsequently granted a decree, allowing the District to operate under a plan for augmentation. In the decades since establishing this foundational piece in its water rights portfolio, the District has continually re-evaluated elements of the original analysis related to water demands and the ability for its water supply system to both physically and legally meet those demands. The most recent update occurred between 2011 and 2013. During this period, the District was in opposition to water court cases filed by the Colorado Water Conservancy Board and Skyland Metropolitan District related to their interest in the Breem Ditch. In its analysis of the how these cases would potentially impact the District, LRE Water developed a daily spreadsheet model that incorporated basin hydrology, river administration, existing and future water demands, and the operation of the District's plan for augmentation. The model covered a period of record from 1994 to 2012. The following Water Rights Master Plan re-examines the District's existing and future water demands and extends the modeling period for the analysis through 2021. In addition, this update includes recent changes to the District's water rights portfolio and potable system. Specifically, in 2015, the District entered into an agreement with the Upper Gunnison River Water Conservancy District for storage supplies in Meridian Lake Reservoir (a.k.a. Long Lake), and in 2021, the District replaced the diversion system at the East River Pump Station, which increased its pumping capacity from 1.0 MGD (1.5 cfs) to 1.5 MGD (2.3 cfs).

The objective of this report is to provide the District with the best available information to support water resource planning efforts and to guide the decision making process tied to future development opportunities. Section 2.0 of the report examines the production records in order to derive the monthly, annual, and peak day water demand within the District's existing service area. The seasonal peak day water demands were subsequently used as a basis for projecting the District's future water requirements at buildout. In addition, Section 2.0 of the report also establishes an approximate timeline for when that future demand level will be reached based on various growth scenarios. Section 3.0 of the report then analyzes the physical and legal availability of the District's water supply system to meet both existing and future demands, and finally, Section 4.0 of the report summarizes the findings of the study and provides water supply strategies to help assist the District in securing and maintaining a long term reliable water supply. Key findings from the updated master plan are outlined in the following Executive Summary.

1.1 EXECUTIVE SUMMARY

- The District's has two plans for augmentation that support its overall potable water system. The augmentation plan decreed in Case No. 95CW218 is specific to the potable system that supports the Meridian Lake Park Subdivision. That case was based on the water demand associated with the development of 183 single family lots. The augmentation plan decreed in Case No. 91CW49 is specific to the potable system that is supplied by diversion from the Crested Butte Ltd. Pipeline and the East River Pump Station, and serves the majority of the District's service area. The water demands within the overall service area are less defined than those in the Meridian Lake Park Subdivision, and as such, this Master Plan update focuses on the water supply system that is tied to the plan for augmentation decreed in Case No. 91CW49.

- **The District relies on two main sources of supply to meet its year-round and peak day demands; the Crested Butte Ltd. Pipeline which consists of a series of springs that originate from the Woods Creek drainage near Crested Butte Mountain, and diversions from the East River at the East River Pump Station**. The water supply that is physically and legally available at these structures is sufficient to meet the District's existing potable water demand.

- For water supply planning purposes, a single family dwelling (SFD) has a defined daily water demand, and this unit of measurement can be scaled up or down depending on the development project. The District estimates that its current level of development is equal to approximately 2,800 SFDs. At build-out, the total number of SFDs that can be served by the District is projected to be 6,200 SFDs. The existing demand for potable water within the District's service area, therefore, is approximately 45% of build-out conditions.

    - On average, over the 10-year study period from 2012-2021, the District diverted approximately 155.6 million gallons (MG) or 477.4 acre-feet (AF) per year to meet existing water demands within its service area. This annual demand is influenced by a population that is tied to the area's mountain resort economy, and seasonally there are two peak periods of water use: a winter season from December to March, and a summer season from June to September. **The District's current peak day demand during these periods is approximately 0.95 cfs in March and 1.71 cfs in July.**

    - **At build-out, the annual demand for potable water is projected to be 344.5 MG or 1,057.1 AF, with a peak day demand of 2.11 cfs in March and 3.79 cfs in July**.

- **In dry years, the amount of water that can be diverted through the District's existing water supply system is limited to approximately 1.70 cfs in the winter and 2.08 cfs in the summer**. The winter rate reflects diverting 0.10 cfs from the Crested Butte Ltd. Pipeline and 1.60 cfs from the East River Pump Station. The summer rate reflects diverting 0.30 cfs from the Crested Butte Ltd. Pipeline and 1.78 cfs for the East River Pump Station. **These**

seasonal diversion rates are less than the peak day demands projected at build-out: 2.11 cfs in the winter and 3.79 cfs in the summer.

- The Crested Butte Ltd. Pipeline collects water from a series of springs originating from the Woods Creek drainage. These springs produce water on a year-round basis; however, the contributing watershed is limited both in its size and in the amount of precipitation that it receives. As such, this supply is physically limited compared to the District's existing water demand. At a minimum, during dry years, the springs are estimated to produce 0.10 cfs in the winter season and 0.30 cfs in the summer season. This physically available supply is not further constrained by legal limitation. While there is a potential for downstream, senior agricultural water users to place the tributary stream system under administration, the return flow supply from the District's East River diversions is more than sufficient to augment any out-of-priority depletion associated with the water supply diverted at the Crested Butte Ltd. Pipeline.

- **The East River Pump Station is the District's primary source of supply**. It diverts water directly from the East River at a location approximately 12.5 miles upstream of the confluence of the East and Slate Rivers, and in this reach of the East River, the average monthly flow rates top 400 cfs during the height of spring runoff, and recede to an average winter baseflow of just under 10 cfs. This physical supply is more than sufficient to meet the peak day winter and summer demands at build-out; however, the ability to divert this supply is legally limited. The Colorado Water Conservation Board (CWCB) has a year-round minimum instream flow water right on the East River that in the winter season is decreed for 15 cfs. During this period, there is a potential for flows to drop below the minimum and for the CWCB to place an administrative call. **The District has three water rights decreed to the East River Pump Station that are senior to the CWCB's instream flow water rights. These water rights total 1.60 cfs, and allow the District to continue to divert up to that rate during the winter season**. In the summer season, there is potential for downstream, senior agricultural water users to place an administrative call on the East River. **The plan for augmentation decreed in Case No. 91CW49 allows the District to divert 1.78 cfs by exchange under its ownership interest in the Verzuh-Young Bifano Ditch when an administrative call is placed on the East River above the Slate River confluence**, and if the calling water right originates on the East River below the Slate River confluence, the District can apply the historical consumptive use credits from its ownership interest in the Verzuh-Young Bifano Ditch for augmentation.

➢ Based on the existing peak day demand during the winter season, the District's current water supply system could potentially support the development of approximately 2,200 additional SFDs. **However, based on the existing peak day demand during the summer season, the District's current water supply system could only support the development of approximately 600 additional SFDs**. Moreover, the timing of when the District will reach this summer threshold varies from 8 to 20 years depending on a high annual growth rate of 2.5% or a more modest growth rate of 1.0%.

- In addition to evaluating the number of SFDs that the District's current water supply system can support based on peak day demands, LRE Water also analyzed the ability of the District to annually meet the daily demand at build-out during dry and extremely dry years. Specifically, the average day demand at build-out was modeled against a 28-year period of river administration and streamflow hydrology from 1994 to 2021. **Overall, in dry years, the model showed that at build-out an additional 55.4 AF of supply is needed to either be directly delivered to the District's water treatment plant or as an augmentation supply to the East River Pump Station.**

    - **The District's 2015 agreement for the long-term operation and joint use of Long Lake with the Upper Gunnison River Water Conservancy District (UGRWCD) allocates 300 AF of the 431.85 AF active storage capacity to the District. This storage supply would be sufficient to meet the District's additional water needs at build-out, even during a multiple year drought event.**

SECTION 2: WATER SYSTEM DEMANDS

The Mt. Crested Butte Water & Sanitation District (District) provides potable water and wastewater services to the Town of Mt. Crested Butte and its surrounding communities, which are generally located in north-central Gunnison County, Colorado near the base of the Crested Butte Ski Resort, as shown on ***Figure 1***. The population within this service area fluctuates seasonally with the influx of tourists and second homeowners, and as such, there is a baseline demand for potable water from year-round residents, as well as two peak seasons of water use: winter (Dec-Mar) and summer (Jun-Sep). The District relies on two main sources of supply to meet year-round and peak day demands; a series of springs that originate from the Woods Creek drainage near Crested Butte Mountain, and diversions from the East River at the East River Pump Station and the Malensek Ditch No. 5. These sources are currently able to support the potable water demands associated with the development of approximately 2,800 single family dwellings (SFDs). At build-out, though, water demands within the District's service area are projected to be more than double, with the potential development of an additional 3,400 SFDs (6,200 SFDs total).

In order to determine whether the District's current water supply system is sufficient to meet the demand requirements at build-out, LRE Water had to first define the total annual volume and the average and peak day diversion rates that are needed to meet existing potable demands within the District's service area. Then, based on the existing water use patterns, LRE Water could project the timing of future demands and water requirements at build-out.

2.1 EXISTING WATER DEMANDS

In examining the District's potable water supply system, LRE Water relied on available monthly production data that covered an 18-year period from 2004 through 2021. For the purpose of this analysis, LRE Water based existing conditions on the most recent 10-year period from 2012 to 2021. During this period, the District on average diverted approximately 155.6 million gallons (MG) or 477.4 acre-feet (AF) for potable treatment each year. Over the last 4-year, from 2018 to 2021, the potable demand has decreased by approximately 15% to an average annual volume of 131.7 MG or 404.3 AF. According to District staff, this drop in production can likely be attributed to a combination of conservation and the detection and repair of leaks within the diversion system. That said, without fully understanding the basis for this most recent trend, as well as how people's post-pandemic choices related to housing and travel will impact water use, LRE Water decided that the longer 10-year record of production from 2012 to 2021 is a representative baseline to model existing demands, and from which to forecast future, projected demands. A summary of the total monthly and annual water supply that was diverted by the District from 2012 to 2021 is shown in ***Figure 2***.

2.1.1 Average Day Demand

Over the course of the year, a community that is comprised predominantly of full-time residents will generate a water use pattern that resembles a bell shaped curve. At the start of the year, the potable supply is relatively constant, as the only demand for water is indoor, domestic use. In the

transition from spring to summer, the potable supply begins to increase as the demand for outdoor irrigation increases. This transition typically peaks in July, after which the potable supply begins to decrease, and eventually, the demand for water returns back to winter baseline conditions. The use of potable water supplies within the District's service area, however, does not follow this pattern. Instead, the demand for water is influenced by a seasonal population that is tied to the area's mountain resort economy. As shown, in ***Figure 3***, there are two peak seasons of water use. A peak winter season from December through March and a peak summer season from June through September, and between these peaks are shoulder seasons. The demand for water during the shoulder seasons is most representative of the potable supply that is needed to support the indoor, domestic demands of the area's year-round population. From 2012 to 2021, the District diverted on average 0.29 million gallons per day (MGD) or 0.44 cubic feet per second (cfs) in the shoulder seasons. During the same 10-year period, the District diverted on average 0.38 MGD or 0.59 cfs during the winter season, which is approximately 33% greater than the shoulder season demand. This increase is driven by the ski resort and winter tourism industry that brings an additional population to the Mt. Crested Butte area. In the summer season, the influence of tourists and second homeowners is more difficult to discern as the demand for potable water includes outdoor irrigation. That said, the change in production levels, at the start and end of the summer season, are greater than the additional demand for irrigation alone. On average, from 2012 to 2021, the District diverted 0.61 MGD or 0.94 cfs during the summer season, with production peaking at 0.74 MGD or 1.14 cfs in July. A summary of the District's average monthly rates of diversion from 2012 to 2021 is shown in ***Figure 3***.

Understanding the District's monthly demands is important because there are different seasonal constraints related to the water supply that is physically and legally available to divert through the District's potable system. In comparing the average monthly diversion rates from LRE Water's prior 2011 demand analysis to the current 10-year study period from 2012 to 2021, the District is diverting less. In particular, the demand for water is approximately 16% less during the winter season, with the average diversion rate from December through March going from 0.70 cfs in the 2011 analysis to 0.59 cfs in the current analysis. Similarly, the demand for water during the summer season is less, but the difference isn't as notable. From June through September, the average monthly diversion rate went from 0.99 cfs in the 2011 analysis to 0.94 cfs in the current analysis, which is a reduction of approximately 4.5%. The 2011 demand analysis, however, relied on production data that included the second highest diversion total in the District's 18-year record from 2004 to 2021. The two highest diversion totals occurred in 2008 and 2009; a period that coincided with a booming pre-recession tourism economy. During this period, the District diverted nearly 185 MG or 570 AF annually, which is approximately 18% more than the average annual supply diverted from 2012 to 2021. That said, there were years within the 10-year study period that the average monthly diversion rates were equal to or greater than average monthly rates used in the 2011 demand analysis. Specifically, in 2015, the average monthly diversion rate was 0.73 cfs in the winter season and 0.98 cfs in the summer season. The overall reduction to monthly diversion rates is therefore driven by the most recent 4-year period from 2018 to 2021, and again, without fully understanding the basis for this recent trend or how post-pandemic housing and

travel choices will impact water use within the District's service area, LRE Water decided that the 10-year record from 2012 to 2021 is a representative baseline to model existing demands. The average monthly diversion rates that are representative of existing conditions under the current demand analysis, as well as the prior 2011 analysis are shown in ***Figure 4***.

2.1.2 Peak Day Demand

While the total annual diversion supply and seasonal pattern of use provide an overview of the timing and magnitude of the District's water demands, the potable system is ultimately limited by its ability to meet the peak day demand. Beginning in 2015, the District started recording the maximum daily diversion rate for the month, along with the total diverted supply. Prior to that year, though, daily diversion data was not included in the District's water use reports. As such, in order to approximate the peak day demand for the 10-year study period from 2012 to 2021, LRE Water applied a peaking factor of 1.5 to the average day, monthly diversion rates. The same 1.5 peaking factor was used in LRE Water's prior 2011 demand analysis. At that time, the peaking factor was based on LRE Water's evaluation of daily production records for other similarly sized mountain resort communities. In updating the demand analysis for this water rights master plan, LRE Water was able to validate that assumption by comparing the maximum daily diversion rate for the month to the average day, monthly diversion rate from 2015 to 2021.

On a seasonal basis, the greatest demand for water within the District's service area occurs in March and July. From 2012 to 2021, the District diverted on average 0.63 cfs in March and 1.14 cfs in July. The approximate peak day demand during these months is then equal to 0.95 cfs in March (0.63 fs * 1.5 = 0.95 cfs) and 1.71 cfs in July (1.14 * 1.5 = 1.71 cfs). The existing peak day water demands for this current demand analysis, as well as the prior 2011 demand analysis are shown on the top half of ***Figure 5***.

2.2 BUILD-OUT DEMAND

For water supply planning purposes, a single family dwelling (SFD) is defined as having a daily water demand that is equal to 350 gallons. This metric assumes that on average a single family dwelling will be occupied by 3.5 people that each use approximately 100 gallons per day (gpd). As a planning tool this unit of measurement can then be scaled up or down depending on the development project. A duplex dwelling, for example, has an expected occupancy of less than 3.5 people, and therefore, the associated water demand would be a fraction of 1 SFD. The District assigns an SFD equivalent to all of the residential housing projects and commercial buildings within its service area, and to-date it has assigned approximately 2,800 SFDs. At build-out, the total number of SFDs within the District's service area is projected to be 6,200 based on Stantec's 2014 Water Master Plan Update. The purpose of that master planning process was to identify potential deficiencies at build-out related to water treatment and the sizing of infrastructure for the potable system. JVA Consulting Engineers subsequently used the same build-out criteria for its preliminary design work related to the District's water treatment plant improvement project. For this update to the water rights master plan, the District concluded that it was still appropriate to base build-out demands on a projection of 6,200 SFDs. As such, the District's current level of

development is approximately 45.2% of build-out (2,800 SFDs / 6,200 SFDs), and if existing water use patterns continue, the District can expect that the demand for potable supplies will more than double.

At build-out, existing water demands on the potable system are projected to increase by more than 120% (3,400 additional SFDs / 2,800 existing SFDs). The average annual demand will increase by approximately 580 AF, going from a total of 477.4 AF to 1,057.1 AF (155.6 MG to 344.5 MG). The peak winter demand will increase by approximately 47.5 AF, going from a total of 39.0 AF to 86.4 AF in March (12.7 MG to 28.1 MG), and the peak summer demand will increase by approximately 85 AF, going from a total of 70.2 AF to 155.4 AF in July (22.9 MG to 50.6 MG).

By comparison, in Case No. 91CW49, the District's plan for augmentation contemplated an annual demand at build-out of 1,272.5 AF, which is approximately 215 AF more than current projections. This difference, however, is not uniformly distributed through the year. On a seasonal basis, the current projections at build-out reflect a higher demand for water during the peak summer season and a lower demand for water during the peak winter season. In the District's plan for augmentation, water demands from June through September were projected to be 495.8 AF at build-out, with a peak monthly demand of 146.0 AF in June. The current water demand projections for the summer season total 508.0 AF, with a peak monthly demand of 155.4 AF in July. The difference, therefore, being an average seasonal increase of approximately 12.2 AF, and a peak season increase of approximately 9.4 AF. For the peak winter season, the District's plan for augmentation projected water demands from December through March to be 506.9 AF at build-out, with a peak monthly demand of 130.0 AF in March. The current water demand projections for the winter season total 312.7 AF, with a peak monthly demand of 86.4 AF in March. The difference, therefore, being an average seasonal decrease of approximately 194.2 AF, and a peak season decrease of approximately 43.6 AF.

Water use within the District's service area reflects the variability of the economy and the type of residential and commercial developments that are built. As such, it is not surprising that current projections differ from what was contemplated nearly 30 years ago. The basis for the District's legal water supply, though, is its plan for augmentation. Therefore, it is important for the District to continually update where demands are projected to be at build-out, and to assess the ability of its potable system to meet those demands both physically and legally. For this water rights master plan update, the potable demand at build-out was analyzed in two ways. One, LRE Water used the average daily diversion rates that were derived from the projected monthly water demands at build-out in its model of District's plan for augmentation. The model assessment identified the frequency and magnitude of system shortages, wherein the District's potable system was unable to meet the daily demand based on historical basin hydrology and river administration. In addition, LRE Water also analyzed the peak day demand for the winter and summer seasons. This assessment identified whether the constraining factor at the District's point of diversion was a physical limitation or a legal limitation, and then based on the existing seasonal peak day demands, LRE Water could use annual growth rates to approximate when the District would reach these constraints. Specifics related to the average day and peak day demands at build-out are

summarized in Sections 2.2.1 and 2.2.2, respectively, and the results of the demand analyses are summarized in Section 3.3.

2.2.1 Average Day Demand at Build-Out

As described in Section 2.1.1, the existing demand for water within the District's service area is currently being modeled based on production data for a 10-year period from 2012 to 2021. At build-out, water demands are projected to increase by more than 120% with the potential development of an additional 3,400 SFDs. The resulting average day, monthly water demand, at the height of the winter and summer seasons, will increase from 0.63 cfs to 1.40 cfs (0.41 MGD to 0.91 MGD) in March, and from 1.14 cfs to 2.53 cfs (0.74 MGD to 1.63 MGD) in July, and on an average seasonal basis, water demands will increase from 0.59 cfs to 1.30 cfs (0.38 MGD to 0.84 MGD) in the winter, and from 0.94 cfs to 2.09 cfs (0.61 MGD to 1.35 MGD) in the summer.

The average day, monthly diversion rate and total volume of water that is projected to be needed at build-out is summarized in ***Figure 4***. For comparative purposes, the average day, monthly diversion rate and total volume of water that would have been projected based on the existing conditions modeled in the 2011 demand analysis is also summarized in ***Figure 4***.

2.2.2 Peak Day Demand at Build-Out

As described in Section 2.1.2, LRE Water used a peaking factor of 1.5 to approximate the District's existing peak day water requirements based on the average monthly production data for a 10-year period from 2012 to 2021. For the critical months of March and July, when the demand for water is at a seasonal high, the existing peak day diversion requirement is approximately 0.95 cfs (0.63 cfs * 1.5 = 0.95 cfs) and 1.71 cfs (1.14 cfs * 1.5 = 1.71 cfs), respectively.

The same peaking factor of 1.5 was also used to derive the peak day demands at build-out. For the critical months of March and July, when the demand for water is at a seasonal high, the approximate peak day diversion requirement is projected to be 2.11 cfs (1.40 cfs * 1.5 = 2.11 cfs) and 3.79 cfs (2.53 cfs * 1.5 = 3.79 cfs), respectively.

The monthly, peak day diversion rates that are projected at build-out are summarized in ***Figure 5***. In addition, for comparative purposes, the monthly, peak day diversion rates that would have been projected based on the existing conditions modeled in the 2011 demand analysis are also summarized in ***Figure 5***.

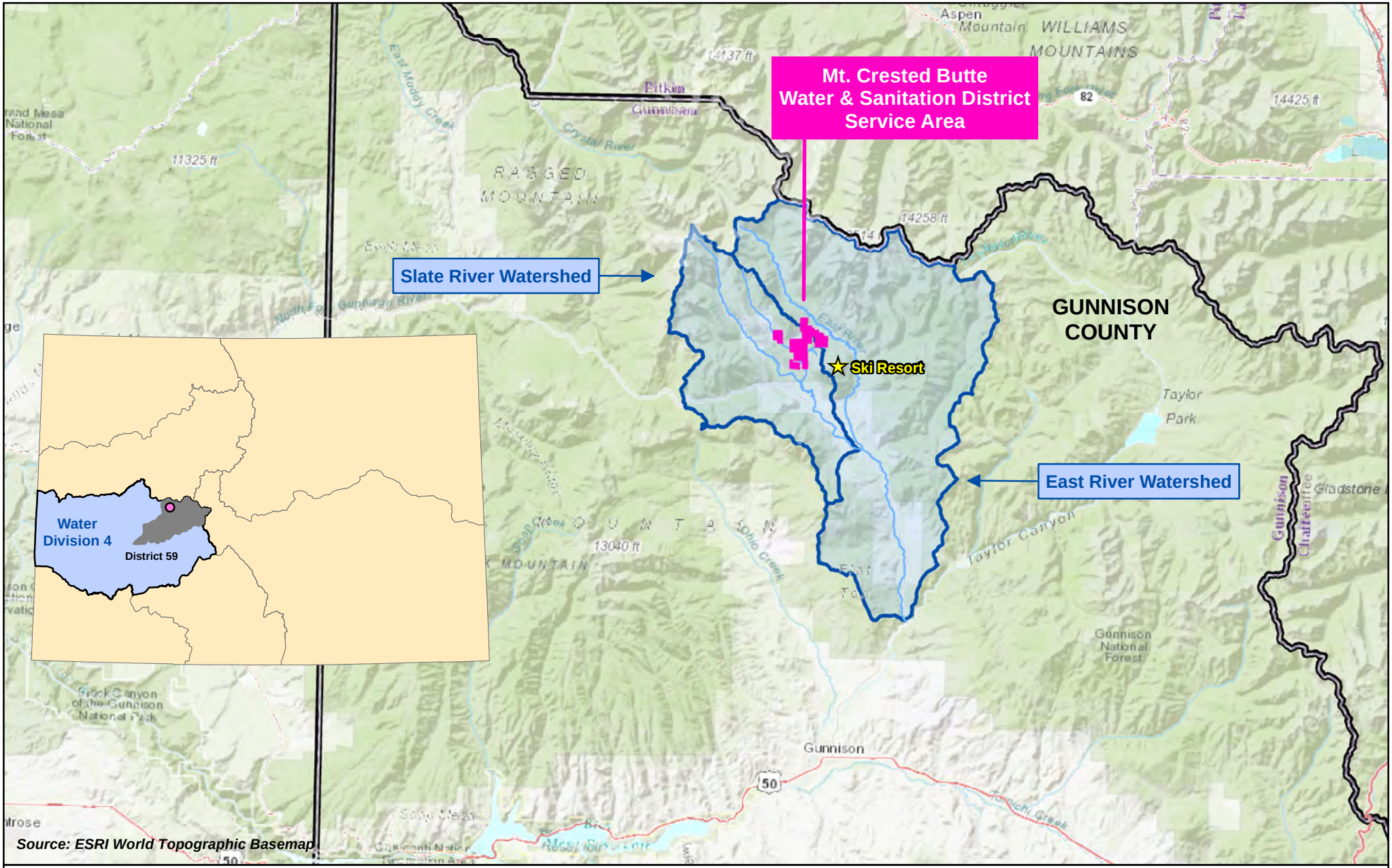


Figure 1: Vicinity Map
Mt. Crested Butte W&SD Master Plan Update

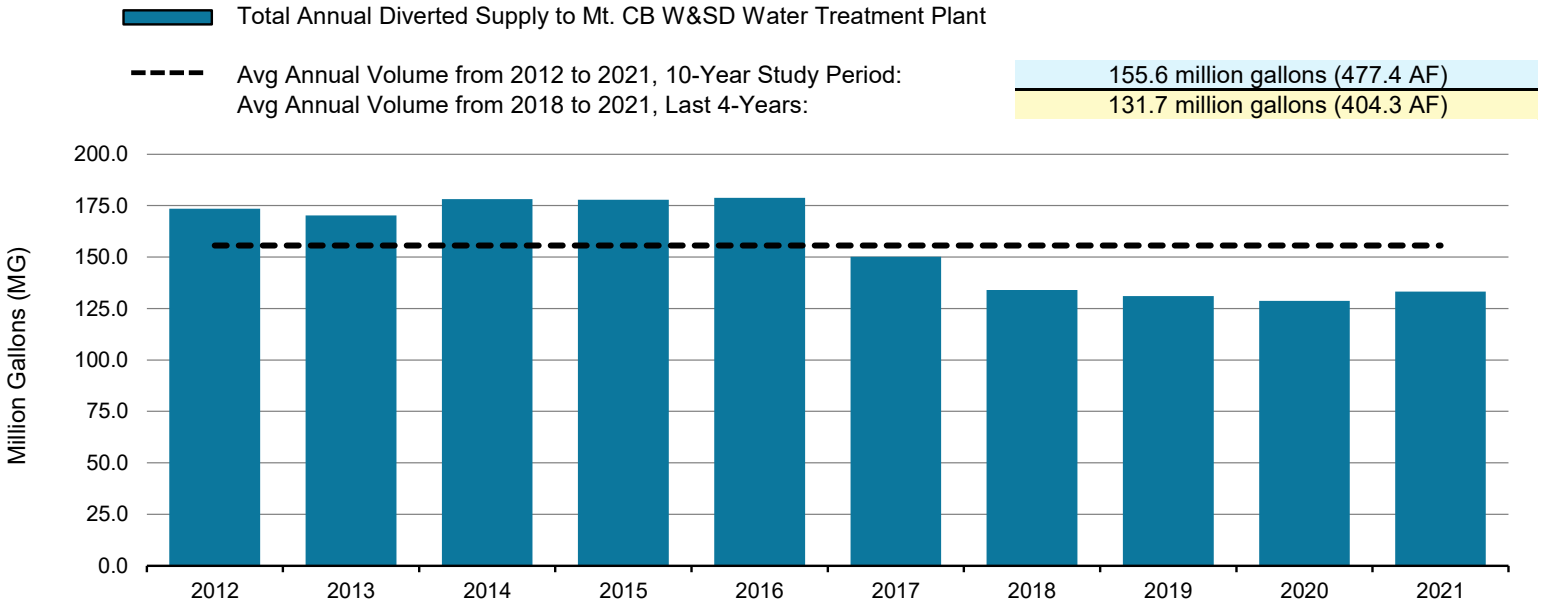
LRE WATER

Miles

0 5 10 20

Date: 2024-04-10
File: 20165-1.7
Drawn: ANM
Approved: ANM

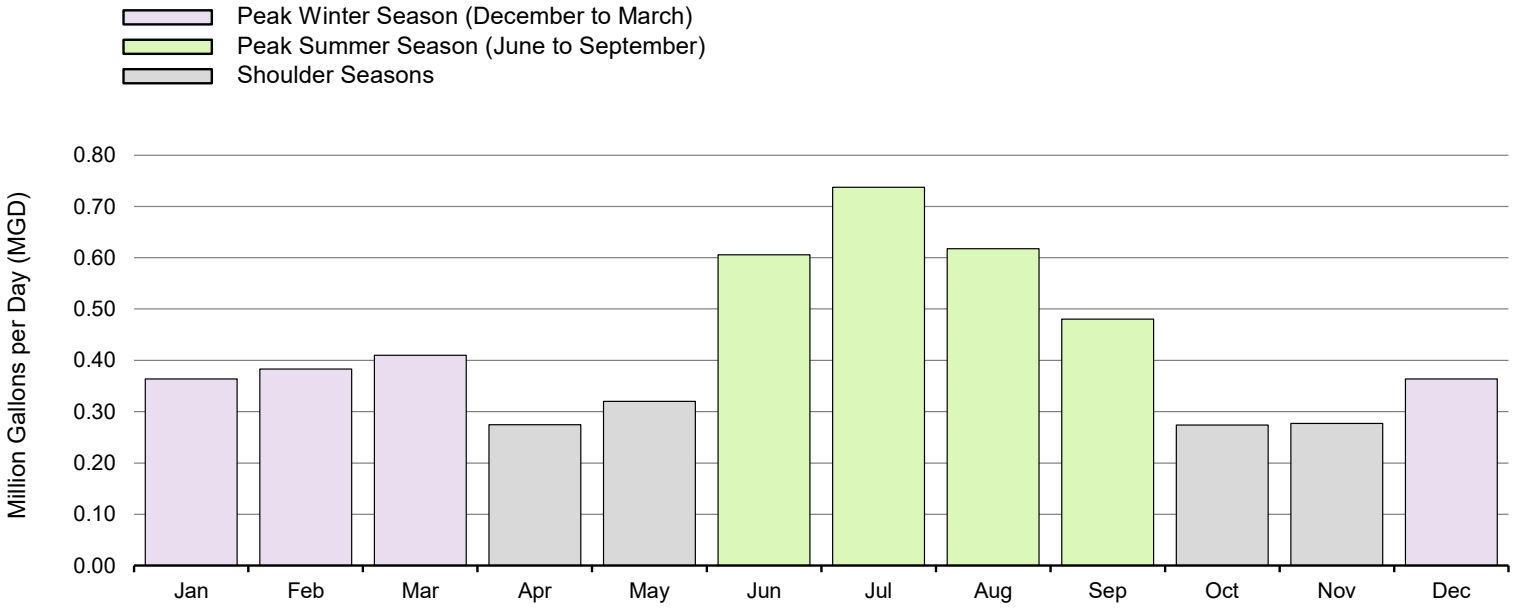
Figure 2
Summary of the Total Annual Diversions for Mt. Crested Butte Water & Sanitation District
Existing Conditions: 2012 to 2021



	TOTAL DIVERTED SUPPLY										
	2012 (MG)	2013 (MG)	2014 (MG)	2015 (MG)	2016 (MG)	2017 (MG)	2018 (MG)	2019 (MG)	2020 (MG)	2021 (MG)	Monthly Average
Jan	11.7	12.1	12.1	15.1	10.6	11.3	10.6	9.9	8.8	10.8	11.3
Feb	12.4	11.0	11.4	11.4	12.6	10.9	9.4	9.8	8.3	10.1	10.7
Mar	13.9	12.2	14.6	17.6	13.7	12.1	11.0	10.9	8.6	12.5	12.7
Apr	10.3	8.4	10.3	12.2	10.9	7.0	6.5	7.5	4.4	4.6	8.2
May	13.7	11.0	10.9	11.3	11.0	7.6	10.0	7.5	7.8	8.5	9.9
Jun	23.0	21.3	21.8	18.4	18.1	18.1	16.6	12.8	15.3	16.3	18.2
Jul	23.4	25.3	29.3	24.2	21.7	24.2	20.5	21.2	19.2	19.7	22.9
Aug	20.7	19.3	21.7	20.1	22.5	19.2	16.1	16.9	18.7	16.1	19.1
Sep	15.1	14.8	14.6	14.5	18.3	15.6	12.5	13.5	12.6	12.8	14.4
Oct	10.5	10.1	10.1	10.5	9.5	7.5	6.2	6.5	7.2	6.9	8.5
Nov	8.2	10.0	7.4	9.1	16.7	6.5	5.7	5.7	8.0	5.8	8.3
Dec	10.5	14.8	13.8	13.6	13.1	10.2	9.1	8.8	9.8	9.1	11.3
Total	**173.5**	**170.2**	**178.1**	**177.9**	**178.7**	**150.2**	**134.1**	**131.0**	**128.8**	**133.1**	**155.6**

	2012 (AF)	2013 (AF)	2014 (AF)	2015 (AF)	2016 (AF)	2017 (AF)	2018 (AF)	2019 (AF)	2020 (AF)	2021 (AF)	Monthly Average
Jan	35.8	37.2	37.2	46.3	32.6	34.6	32.5	30.2	27.0	33.0	34.6
Feb	38.0	33.6	35.1	34.9	38.6	33.5	29.0	30.1	25.4	31.1	32.9
Mar	42.7	37.5	44.7	54.1	42.1	37.1	33.7	33.4	26.5	38.3	39.0
Apr	31.7	25.9	31.8	37.5	33.5	21.5	19.9	23.1	13.6	14.2	25.3
May	42.1	33.7	33.4	34.6	33.6	23.4	30.7	22.9	24.0	26.1	30.4
Jun	70.7	65.4	66.9	56.5	55.6	55.4	50.8	39.3	46.8	50.1	55.8
Jul	71.8	77.6	90.0	74.3	66.5	74.2	62.9	65.0	59.0	60.4	70.2
Aug	63.7	59.2	66.6	61.6	69.0	59.0	49.3	52.0	57.5	49.5	58.7
Sep	46.4	45.5	44.7	44.4	56.3	47.8	38.2	41.5	38.6	39.2	44.3
Oct	32.2	30.9	30.9	32.1	29.1	23.0	19.0	20.1	22.2	21.1	26.1
Nov	25.2	30.7	22.9	27.9	51.3	20.1	17.4	17.6	24.4	17.7	25.5
Dec	32.2	45.4	42.5	41.6	40.3	31.3	28.0	26.9	30.2	28.0	34.6
Total	**532.4**	**522.5**	**546.7**	**545.8**	**548.4**	**460.9**	**411.4**	**402.0**	**395.2**	**408.6**	**477.4**

Figure 3
Summary of the Average Monthly Diversion Rates for Mt. Crested Butte Water & Sanitation District
Existing Conditions: 2012 to 2021



	AVERAGE DIVERSION RATE										
	2012 (MGD)	2013 (MGD)	2014 (MGD)	2015 (MGD)	2016 (MGD)	2017 (MGD)	2018 (MGD)	2019 (MGD)	2020 (MGD)	2021 (MGD)	Monthly Average
Jan	0.38	0.39	0.39	0.49	0.34	0.36	0.34	0.32	0.28	0.35	0.36
Feb	0.44	0.39	0.41	0.41	0.45	0.39	0.34	0.35	0.30	0.36	0.38
Mar	0.45	0.39	0.47	0.57	0.44	0.39	0.35	0.35	0.28	0.40	0.41
Apr	0.34	0.28	0.34	0.41	0.36	0.23	0.22	0.25	0.15	0.15	0.27
May	0.44	0.35	0.35	0.36	0.35	0.25	0.32	0.24	0.25	0.27	0.32
Jun	0.77	0.71	0.73	0.61	0.60	0.60	0.55	0.43	0.51	0.54	0.61
Jul	0.75	0.82	0.95	0.78	0.70	0.78	0.66	0.68	0.62	0.63	0.74
Aug	0.67	0.62	0.70	0.65	0.73	0.62	0.52	0.55	0.60	0.52	0.62
Sep	0.50	0.49	0.49	0.48	0.61	0.52	0.42	0.45	0.42	0.43	0.48
Oct	0.34	0.32	0.32	0.34	0.31	0.24	0.20	0.21	0.23	0.22	0.27
Nov	0.27	0.33	0.25	0.30	0.56	0.22	0.19	0.19	0.27	0.19	0.28
Dec	0.34	0.48	0.45	0.44	0.42	0.33	0.29	0.28	0.32	0.29	0.36
									Winter Average:		0.38
									Summer Average		0.61

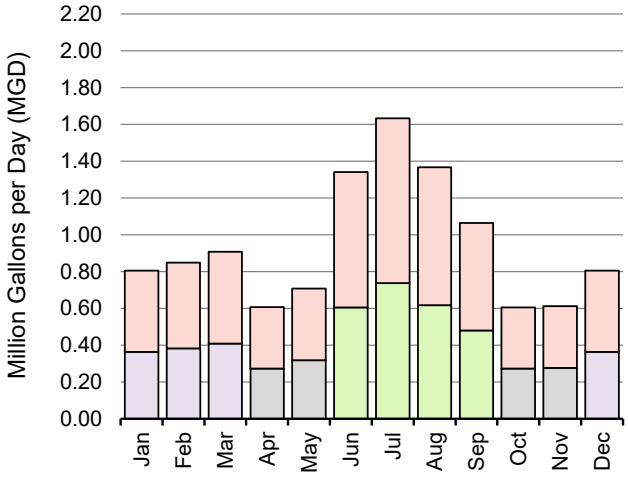
	2012 (cfs)	2013 (cfs)	2014 (cfs)	2015 (cfs)	2016 (cfs)	2017 (cfs)	2018 (cfs)	2019 (cfs)	2020 (cfs)	2021 (cfs)	Monthly Average
Jan	0.58	0.60	0.60	0.75	0.53	0.56	0.53	0.49	0.44	0.54	0.56
Feb	0.68	0.61	0.63	0.63	0.69	0.60	0.52	0.54	0.46	0.56	0.59
Mar	0.69	0.61	0.73	0.88	0.68	0.60	0.55	0.54	0.43	0.62	0.63
Apr	0.53	0.44	0.53	0.63	0.56	0.36	0.34	0.39	0.23	0.24	0.42
May	0.68	0.55	0.54	0.56	0.55	0.38	0.50	0.37	0.39	0.42	0.50
Jun	1.19	1.10	1.12	0.95	0.93	0.93	0.85	0.66	0.79	0.84	0.94
Jul	1.17	1.26	1.46	1.21	1.08	1.21	1.02	1.06	0.96	0.98	1.14
Aug	1.04	0.96	1.08	1.00	1.12	0.96	0.80	0.85	0.94	0.80	0.96
Sep	0.78	0.76	0.75	0.75	0.95	0.80	0.64	0.70	0.65	0.66	0.74
Oct	0.52	0.50	0.50	0.52	0.47	0.37	0.31	0.33	0.36	0.34	0.42
Nov	0.42	0.52	0.38	0.47	0.86	0.34	0.29	0.30	0.41	0.30	0.43
Dec	0.52	0.74	0.69	0.68	0.66	0.51	0.45	0.44	0.49	0.46	0.56
									Winter Average:		0.59
									Summer Average		0.94

Figure 4
Summary of Existing and Build-Out Demands for Mt. Crested Butte Water & Sanitation District
Average Day Analysis

Additional Demand Projected at Build-Out

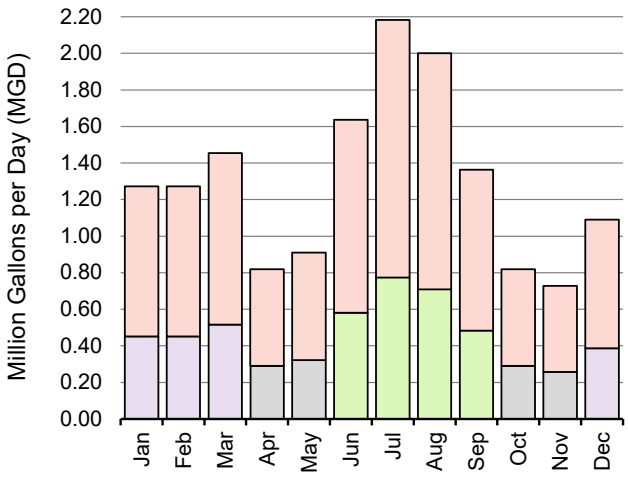
Peak Winter Season (December to March)
Peak Summer Season (June to September)
Shoulder Seasons

Current Analysis (2012-2021 Avg)



	Existing Conditions (MGD)	Existing Conditions (cfs)	Build-Out Conditions Diversion Rate (MGD)	Build-Out Conditions Diversion Rate (cfs)	Build-Out Conditions Volume (AF)
Jan	0.36	0.56	0.81	1.25	76.7
Feb	0.38	0.59	0.85	1.31	72.9
Mar	0.41	**0.63**	0.91	**1.40**	**86.4**
Apr	0.27	0.42	0.61	0.94	56.0
May	0.32	0.50	0.71	1.10	67.4
Jun	0.61	0.94	1.34	2.07	123.5
Jul	0.74	**1.14**	1.63	**2.53**	**155.4**
Aug	0.62	0.96	1.37	2.12	130.1
Sep	0.48	0.74	1.06	1.65	98.0
Oct	0.27	0.42	0.61	0.94	57.7
Nov	0.28	0.43	0.61	0.95	56.5
Dec	0.36	0.56	0.81	1.25	76.7
Winter Average:	0.38	**0.59**	0.84	**1.30**	**78.2**
Summer Average:	0.61	**0.94**	1.35	**2.09**	**126.7**
Total:					**1,057.1**

2011 Analysis (2009-2010 Avg)



	Existing Conditions (MGD)	Existing Conditions (cfs)	Build-Out Conditions Diversion Rate (MGD)	Build-Out Conditions Diversion Rate (cfs)	Build-Out Conditions Volume (AF)
Jan	0.45	0.70	1.27	1.97	121.4
Feb	0.45	0.70	1.27	1.97	109.6
Mar	0.52	**0.80**	1.45	**2.26**	**138.7**
Apr	0.29	0.45	0.82	1.27	75.5
May	0.32	0.50	0.91	1.41	86.7
Jun	0.58	0.90	1.64	2.54	151.0
Jul	0.77	**1.20**	2.18	**3.38**	**208.0**
Aug	0.71	1.10	2.00	3.10	190.7
Sep	0.48	0.75	1.36	2.11	125.8
Oct	0.29	0.45	0.82	1.27	78.0
Nov	0.26	0.40	0.73	1.13	67.1
Dec	0.39	0.60	1.09	1.69	104.0
Winter Average:	0.45	**0.70**	1.27	**1.97**	**118.4**
Summer Average:	0.64	**0.99**	1.80	**2.78**	**168.9**
Total:					**1,456.5**

Figure 5
Peak Day Analysis & Seasonal Water Supply Limitations

Development Parameters	2011 Analysis	Current Analysis	
Current Number of SFDs:	2,199	2,800	*SFDs based on District estimate.*
SFDs at Build-Out:	6,200	6,200	*Build-Out SFD Count based on CB 2020 Study.*
Percent of Build-Out:	35.5%	45.2%	*Current Number of SFDs divided by the Total Number of SFDs at Build-Out.*
Peak Day Factor:	1.5	1.5	*Based on a comparison of average monthly production to maximum day.*

	Current Analysis (2012-2021 Avg)				2011 Analysis (2009-2010 Avg)			
	Existing Conditions		Build-Out Demand		Existing Conditions		Build-Out Demand	
	Avg Day Demand (cfs)	**Peak Day** Demand (cfs)	**Avg Day** Demand (cfs)	**Peak Day** Demand (cfs)	**Avg Day** Demand (cfs)	**Peak Day** Demand (cfs)	**Avg Day** Demand (cfs)	**Peak Day** Demand (cfs)
Jan	0.56	0.84	1.25	1.87	0.70	1.05	1.97	2.96
Feb	0.59	0.89	1.31	1.97	0.70	1.05	1.97	2.96
Mar	**0.63**	**0.95**	**1.40**	**2.11**	**0.80**	**1.20**	**2.26**	**3.38**
Apr	0.42	0.64	0.94	1.41	0.45	0.68	1.27	1.90
May	0.50	0.74	1.10	1.64	0.50	0.75	1.41	2.11
Jun	0.94	1.41	2.07	3.11	0.90	1.35	2.54	3.81
Jul	**1.14**	**1.71**	**2.53**	**3.79**	**1.20**	**1.80**	**3.38**	**5.08**
Aug	0.96	1.43	2.12	3.17	1.10	1.65	3.10	4.65
Sep	0.74	1.12	1.65	2.47	0.75	1.13	2.11	3.17
Oct	0.42	0.64	0.94	1.41	0.45	0.68	1.27	1.90
Nov	0.43	0.64	0.95	1.42	0.40	0.60	1.13	1.69
Dec	0.56	0.84	1.25	1.87	0.60	0.90	1.69	2.54

Crested Butte Ltd. Pipeline

Water Rights	Winter	Summer
Malensek Ditch	1.50 cfs	1.50 cfs
Vuds Ditch	0.50 cfs	0.50 cfs
CB Ltd. Pipeline	3.00 cfs	3.00 cfs
Physical Limit:	0.100 cfs	0.300 cfs
Legal Limit:	--	Augment

Slate River / Washington Gulch Limitations

PHYSICAL SUPPLY: The spring sources that feed the CB Ltd. Pipeline were measured by the District in the dry-years of 1989-1990. In the late summer season, flows were on average 0.3 cfs. In the winter season, flows were at a low of 0.18 cfs in January.

LEGAL SUPPLY: There is potential for senior agricultural water users to place a call during the late irrigation season (Jul-Sep). Return flows from East River diversions, however, are more than sufficient to augment any out-of-priority depletions associated with the CB Ltd Pipeline.

East River Pump Station (ERPS)

Water Rights	Winter	Summer
VYB Exchange		1.78 cfs
Gothic Ditch	1.00 cfs	1.00 cfs
Malensek Ditch No. 5	0.50 cfs	3.50 cfs
ERPS Original	0.10 cfs	
ERPS Enlargement	3.00 cfs	3.00 cfs
Physical Limit:	--	--
Legal Limit:	1.600 cfs	1.780 cfs

Upper & Lower East River Limitations

PHYSICAL SUPPLY: Prior investigations of the available physical supply at the ERPS have always shown more a sufficient source of water to support current and future demands within the District.

LEGAL SUPPLY: There is potential for senior agricultural water users on the Upper East and Lower East River to place a call during the late irrigation season (Jul-Sep). The VYB Exchange for 1.78 cfs, however, is senior. There is also the potential for the minimum instream flow to place a call during the winter (Nov-Mar). The Gothic Ditch, Malensek Ditch No. 5, and ERPS Original water rights totaling 1.60 cfs, however, are senior to this call.

SECTION 3: WATER AVAILABILITY

The ability for the District to reliably meet the potable demand within its service area at build-out depends on the source or sources of supply that are available to be diverted and delivered to the District's water treatment plant. For a water source to be considered a dependable supply, it must be physically available at the diversion structure and the associated water right(s) must legally be able to divert that supply. Each of these aspects is equally important in determining the adequacy of a water supply system. For example, an abundant water source is unreliable if the water right that is decreed to the diverting structure is curtailed under river administration, because its priority is junior to the downstream calling water user. Likewise, a senior water right is unreliable if the amount of water at the diversion structure is insufficient to meet the required demand. As such, for this water rights master plan update, LRE Water evaluated the supply that is both physically and legally available at the District's points of diversion.

3.1 PHYSICAL WATER SUPPLY

The raw water supply that is delivered to the District's existing potable system is diverted at three locations: (1) from Woods Creek through the Crested Butte Ltd. Pipeline, (2) from the East River at the East River Pump Station, and (3) from at tributary of the East River at the Malensek Ditch No. 5.

The Crested Butte Ltd. Pipeline collection system is located near the western edge of the Wood Creek watershed at an elevation above 10,000 feet. The Woods Creek watershed is part of the Slate River watershed, which is part of the larger East River watershed. At approximately 0.3 square miles, the drainage that supplies the Crested Butte Ltd. Pipeline collection system accounts for approximately 20% of the total Woods Creek watershed, but only 0.3% of the Slate River watershed, and 0.1% of the East River watershed. In contrast, the drainage area of the East River above the East River Pump Station is approximately 32.5 square miles and accounts for 11.2% of the overall East River watershed. Moreover, this drainage area of the East River has a mean elevation of nearly 11,000 feet, and receives 57% more precipitation than the Woods Creek watershed on an average annual basis. The contributing and tributary watersheds are shown in ***Figure 6***.

The difference in watershed characteristics between the Woods Creek drainage and the East River drainage is evident when evaluating the streamflow that is produced by each. At these specific locations the daily streamflow is not monitored; however, a representative flow rate can be developed based on an analysis of the watershed that contributes to the daily record at an established monitoring site. In this area there are two USGS managed streamflow monitoring sites. On the East River, the nearest monitoring site is the East River at Almont gage, which is located approximately 12 miles downstream of the confluence of the Slate and East Rivers, and on the Slate River, the nearest monitoring site is the Slate River above Baxter Gulch gage, which is located approximately 5 miles upstream of the confluence of the Slate and East Rivers, as shown in ***Figure 6***. In prior studies that LRE Water has completed for the District, representative flow records at un-gaged stream locations have been developed based on a unit-area adjustment

of the daily streamflow record for the USGS Slate River at near Crested Butte gage (1994-2006) and the Slate River above Baxter Gulch gage (2006-2021). This methodology quantifies a flow rate per square mile based on the daily streamflow record at the gage location divided by the total contributing watershed area. The flow rate per square mile is then multiplied by the area of the watershed at the un-gaged location in order to develop a representative flow. Based on this regional approach, from 1994 to 2021, the average annual yield of the Woods Creek watershed above the Crested Butte Ltd. Pipeline is just over 400 AF, and the average annual yield of the East River watershed above the East River Pump Station is just over 42,600 AF, as summarized in ***Figure 7 and Figure 8***, respectively.

3.1.1 Crested Butte Ltd. Pipeline

The District's Crested Butte Ltd. Pipeline collection system diverts water from a series of springs that, as shown in ***Figure 6***, originate from the Woods Creek drainage. This supply is subsequently delivered by gravity through a pipeline to the District's pre-sedimentation ponds for subsequent treatment and distribution. These springs produce water on a year-round basis; however, the contributing watershed is limited both in its size and in the amount of precipitation that it receives on an average annual basis. As such, the springs themselves are not capable of meeting the District's existing daily water demand let alone its peak day diversion requirements at build-out. That said, this source of supply is a valuable resource for the District. The gravity diversion system is cost effective, and the high mountain springs are of good water quality.

Historically, LRE Water has estimated that the springs are capable of delivering a dry-year water supply of approximately 203 AF, which based on build-out demands that were projected in the District's plan for augmentation in Case No. 91CW94 would satisfy approximately 15.9% of the total required water supply (202.7 AF / 1,272.5 AF). The monthly diversion rates that are shown in Paragraph 7.2 of that decree were based on field measurements taken by District staff in the spring of 1989 and 1990, both of which were considered to be dry years. LRE Water and the District have continued to use these monthly rates for modeling purposes. In updating this water rights master plan, LRE Water reexamined these rates based on the District's available meter data. From 2004 to 2010, the annual yield from the springs was approximately 132.5 AF, which is 34.6% less than the original dry-year estimate. Then, from 2012 to 2021, the annual yield dropped to less than 24 AF. This data, especially the more recent record from 2012 to 2021 seemed suspect, and as such, LRE Water decided that the monthly diversion rates that are outlined in the District's plan for augmentation should continue to be relied on when evaluating the water supply that is physically available to divert through the Crested Butte Ltd. Pipeline collection system until the District can verify the accuracy of its meter data. Based on this finding, the District has already installed a new meter on the Crested Butte Ltd. Pipeline.

Overall, the Crested Butte Ltd. Pipeline is estimated to have a physical diversion limit of 0.10 cfs in the winter season and 0.30 cfs in the summer season. These limits are referenced in the bottom half of ***Figure 5***.

3.1.2 East River Pump Station

The District's East River Pump Station diverts water directly from the East River at a location approximately 12.5 miles upstream of the confluence of the East River and Slate River, as shown in ***Figure 6***. This supply is subsequently delivered through a pipeline to the District's pre-sedimentation ponds for subsequent treatment and distribution. The East River Pump Station is the District's primary source of supply, and in 2021, the District constructed a new pump station building and replaced the existing diversion system with new vertical turbine pumps, with variable frequency drives (VFDs). The new diversion system increased the District's pumping capacity from 1.0 MGD (1.5 cfs) to 1.5 MGD (2.3 cfs), and was designed to be expanded to a future capacity to 2.0 MGD (3.1 cfs).

As shown in ***Figure 9***, the physical supply of the East River above the East River Pump Station fluctuates seasonally, with average monthly flow rates topping 400 cfs during height of spring runoff, and then receding to an average winter baseflow of just under 10 cfs. At future build-out, LRE Water has projected that the peak day demand for water will be approximately 3.79 cfs in July. The developed streamflow record for the East River above the East River Pump Station shows that, on average, the monthly flow rate in July is well above the projected, peak day demand. Moreover, during the dry-years of 2002, 2012, and 2018, the average monthly flow rate in July was approximately 10.9 cfs, which is nearly three times the peak day demand projected at build-out, and the minimum July flow rate of 8.4 cfs in 2002 is more than double the projected, peak day demand. As such, the water supply that is physically available at the East River Pump Station during the summer season should be sufficient to meet peak day demands at build-out. Similarly, during the winter season, when streamflow levels are at their lowest, the average monthly flow rate is more than four times the peak day demand. LRE Water has projected that the peak day demand for water will be approximately 2.11 cfs in March. On average, the monthly flow rate from December through March is approximately 9.3 cfs, with monthly flows reaching a minimum of 3.7 cfs in February 2019. These average monthly rates, as well as the minimum March flow rate of 5.5 cfs in 2012, are well above the projected peak day demand.

Overall, it appears that the physical water supply that is available to be diverted at the East River Pump Station is not a limiting constraint to the District's water supply system.

3.1.3 Malensek Ditch No. 5

The District's Malensek Ditch No. 5 diverts from a tributary of the East River located approximately 0.2 miles upstream of the East River Pump Station. This source of supply is an important resource to the District's overall potable system because it operates by gravity, delivering water to the District's pre-sedimentation ponds for subsequent treatment and distribution. That said, for the purposes of this water rights master plan update, LRE Water did not specifically analyze the Malensek Ditch No. 5. The tributary supply at this location is less than the supply that is physically available at the District's East River Pump Station. Moreover, the legally available water supply at Malensek Ditch No. 5 is also less than the water supply that can legally be diverted and augmented at the East River Pump Station. Therefore, when modeling the physical and legal

constraints associated with diversions from the East River, the District's East River Pump Station is the key structure to evaluate.

3.2 LEGAL WATER SUPPLY

The District's potable water system relies on the ability to divert water from the East River at the East River Pump Station and from spring sources originating in the Woods Creek watershed at the Crested Butte Ltd. Pipeline. In Section 3.1, LRE Water examined the physical water supply that is available to these sources. The physical supply, however, can only be diverted by the District, if the water rights that are decreed to divert at these structures are in-priority and/or the associated depletive impact is replaced by a decreed plan for augmentation. The legal availability is therefore dependent on the seniority of the District's water rights compared to the rights of other downstream, vested water users, and the District's available augmentation supplies.

Within the State of Colorado, water rights are operated based on the doctrine of prior appropriation – often referred to as "first in time, first in right." Under this system, the State Engineer assigns an administrative priority to each water right. This assigned number is unique and is based on an analysis related to the date that the water right was appropriated (intent to divert and use water) and the date that the water right was adjudicated (confirmed by the Water Court). The smaller the administrative number, the more senior the water right. This priority hierarchy is largely important in water short scenarios, wherein a downstream, senior water right can place an administrative call that requires all upstream, junior water rights to curtail. Meaning that, all water users with administrative numbers greater than the calling water right must either stop diverting or operate under a plan for augmentation that replaces out-of-priority depletions.

The legal characteristics of the water rights that are part of the District's portfolio are summarized in ***Table 1***, and details related to these water rights are provided in the following sub-sections, along with an analysis of the portfolio's ability to provide a reliable legal water supply.

3.2.1 Crested Butte Ltd. Pipeline

There are three water rights decreed to divert at the Crested Butte Ltd. Pipeline:

Water Right Administrative Hierarchy

- 26230.19888: 1.50 cfs, Malensek Ditch (original water right)
- 26230.23357: 0.50 cfs, Vuds Ditch (original water right)
- 41175.00000: 3.00 cfs, Original Water Right

In total, these three absolute water rights are decreed to divert up to 5.0 cfs. The original water right for 3.0 cfs was appropriated on September 25, 1962, by the Crested Butte Ltd. Corporation for the purpose of providing a suitable supply of water for domestic and commercial purposes, and for the irrigation of lawns, gardens, and grounds associated with the development of some 500 homes, as well as businesses, lodges, and other establishments within the developed 400 acres owned, at the time, by the corporation. This water right, which consists of three separate

headgates and feeder lines, each decreed for 1.0 cfs, was adjudicated by the District Court for Gunnison County in Civil Action No. 5782 on October 28, 1965, and then on October 27, 1970, the portion of the right that was conditional (not yet put to beneficial use at the time of adjudication) was made absolute in Case No. W-120.

While this water right was the first to be decreed to the Crested Butte Ltd. Pipeline, it is not the most senior water right that can be diverted at the structure. On December 31, 1987, the District filed Case Nos. 87CW304 and 87CW305 with the District Court for Water Division 4 to alternatively divert 1.5 cfs decreed to the Malensek Ditch original water right and 0.5 cfs decreed to the Vuds Ditch original water right at the Crested Butte Ltd. Pipeline headgate locations. These two water rights were originally adjudicated by the District Court for Gunnison County in Civil Action No. 1714 on January 1, 1924, for the beneficial use of irrigation with an appropriation date of June 14, 1904, for the original Malensek Ditch water right and December 13, 1913, for the original Vuds Ditch water right. Then, in Case Nos. W-267 and W-268, the District changed these agricultural irrigation rights to also be used for domestic purposes. The administrative numbers assigned to these water rights within the Division of Water Resources (DWR) hierarchy are based on the adjudication date, with the appropriation date being a secondary priority. This distinction was applied because the water rights were not claimed during the first opportunity for adjudication, and as a result, have a more junior status (larger administrative number). Overall, though, the water court cases that allow the Malensek and Vuds Ditch water rights to be diverted at the Crested Butte Ltd. Pipeline for domestic purposes significantly improved the legally available water supply.

3.2.2 East River Pump Station

There are seven water rights decreed to divert at the East River Pump Station:

Water Right Administrative Hierarchy

- 28733.28275: 0.50 cfs, Verzuh-Young Bifano Ditch (original water right)
- 30667.28275: 0.50 cfs, Verzuh-Young Bifano Ditch (first enlargement right)
- 30667.30467: 1.00 cfs, Verzuh-Young Bifano Ditch (third enlargement right)

    - In Case No. W-3517, the Verzuh-Young Bifano Ditch water rights were changed to be used for augmentation purposes with the dry-up of 20 acres. As part of the case, the District was granted the ability to divert up to 1.78 cfs during the irrigation season for domestic/municipal purposes, so long as the stream system below the confluence of the Slate River and East River is not under administration. The use of these water rights is described in more detail under Augmentation Source in Section 3.2.4.

- 39252.25397: 1.00 cfs, Gothic Ditch (original water right)
- 39252.29675: 3.50 cfs, Malensek Ditch No. 5 (original water right)
- 47478.00000: 0.10 cfs, Original Water Right
- 51134.47478: 2.50 cfs, First Enlargement Right

In total, these water rights are decreed to divert up to 4.6 cfs year-round and 6.38 cfs during the irrigation season for domestic purposes, and an additionally 3.0 cfs can be diverted for irrigation purposes during the irrigation season. The original East River Pump Station water right was appropriated on December 28, 1979, by the District to divert up to 5.0 cfs for municipal purposes. This water right was adjudicated as a conditional right by the District Court for Water Division 4 in Case No. 79CW353 on December 31, 1979, and then on August 26, 1988, in Case No. 88CW4, the District made 0.10 cfs of the water right absolute and cancelled the remaining 4.9 cfs.

The original East River Pump Station right, however, is not the most senior water right that can be diverted at that structure. As with the Crested Butte Ltd. Pipeline, the District continued to improve the legally available water supply at the East River Pump Station by transferring more senior water rights to the structure. On September 18,1973, the District filed Case No. W-1989 with the District Court for Water Division 4 to transfer its 1.0 cfs ownership of the Gothic Ditch original water right to the East River Pump Station. This water right was adjudicated by the District Court for Gunnison County in Civil Action No. 5590 on January 27, 1961, for both irrigation and domestic purposes with an appropriation date of July 15, 1919. Similarly, on December 31, 1987, and on November 17, 1988, the District filed Case Nos. 87CW303 and 88CW148 with the District Court for Water Division 4 to transfer a total of 3.5 cfs from the Malensek Ditch No. 5 original water right to the East River Pump Station. This water right was also adjudicated by the District Court for Gunnison County in Civil Action No. 5590 on January 27, 1961, to divert up to 8.0 cfs for irrigation purposes with an appropriation date of April 4, 1931. The District subsequently changed a portion of this agricultural irrigation right, in Case No. W-269, to also be used for domestic purposes, and then in Case No. 87CW303, the District transferred the 0.5 cfs that had been decreed absolute for both domestic and irrigation purposes to the East River Pump Station. Then, in Case No. 88CW148, the District transferred an additional 3.5 cfs of the Malensek Ditch No. 5 original water right to the East River Pump Station. In that case, the transferred 3.5 cfs could only be used for irrigation purposes, and the remaining 4.5 cfs that had been decreed to the original water right was cancelled. As with the administrative numbers assigned to the Malensek Ditch and Vuds Ditch water rights that were changed to be alternatively diverted at the Crested Butte Ltd. Pipeline, the Gothic Ditch and Malensek Ditch No. 5 water rights were assigned administrative numbers within the DWR hierarchy based on the adjudication date, with the appropriation date being a secondary priority. Again, this distinction was applied because the water rights were not claimed during the first opportunity for adjudication, and as a result, have a more junior status.

Most recently, the District adjudicated a first enlargement water right, in Case No. 04CW16, to divert up to 3.0 cfs at the East River Pump Station for irrigation, domestic, municipal, commercial, industrial, fire, and snowmaking uses with an appropriation date of December 28, 1979. This enlargement right is conditional, meaning that the District has yet to divert this water right for one of the above described beneficial uses. Moreover, the District is required to file a diligence case with the Water Court every 6 years in order to maintain this enlargement right. In Case No. 10CW0136, the District filed a diligence case, and the District Court for Water Division 4 cancelled

0.5 cfs decreed to the enlargement right, leaving 2.5 cfs conditional. The District's next diligence filing will be in January 2026.

3.2.3 Other Water Rights

In addition to the water rights that are decreed to divert at the District's Crested Butte Ltd. Pipeline and East River Pump Station structures, the District also has water rights to divert at the Malensek Ditch No. 5, water rights associated with Meridian Lake Park Subdivision, and water rights that are or can be used as sources of augmentation. The water rights associated with the Meridian Lake Park Subdivision were not evaluated as part of this water rights master plan update. The District's water rights that supply the subdivision's potable water system are operated under separate plan for augmentation decreed in Case No. 95CW218. The augmentation sources are described in more detail in Section 3.2.4.

As described in Section 3.1.3, the Malensek Ditch No. 5 diverts from a tributary of the East River, and this source is less than the water supply that is physically available at the East River Pump Station. Moreover, all of the water rights decreed to divert at the East River Pump Station are senior to the water rights decreed to divert at the Malensek Ditch No. 5 structure. As such, the water supply diverted at the Malensek Ditch No. 5 structure would be constrained either physically and/or legally before diversions at the East River Pump Station. The District's East River Pump Station is therefore the key structure to evaluate when modeling supplies originating in the Upper East River watershed.

Malensek Ditch No. 5, Water Right Administrative Hierarchy

- 50198.00000: 5.00 cfs, First Enlargement Right (used to fill North Village Reservoir)
- 59900.53552: 2.00 cfs, Second Enlargement Right
- 59900.58074: 2.00 cfs, Second Enlargement Right (snowmaking use added)

The District adjudicated a first enlargement water right, in Case No. 87CW306, to divert up to 5.0 cfs at the Malensek Ditch No. 5 structure for the purpose of filling North Village Reservoir. This first enlargement water right is conditional, and the District's next diligence filing will be in August 2027. The District then adjudicated a second enlargement right, in Case No. 14CW3113, to divert up to 2.0 cfs at the Malensek Ditch No. 5 structure for irrigation, domestic, municipal, commercial, industrial, and fire protection purposes with an appropriation date of August 14, 1996, and an additional use for snowmaking with an appropriation date of December 31, 2008. In this case, the District made 1.6 cfs of the second enlargement water right absolute of all uses except snowmaking. The District made the remaining 0.4 cfs absolute of all uses except snowmaking in Case No. 22CW3019. The District's next diligence filing associated with the 2.0 cfs that is decreed for snowmaking use will be in September 2028.

3.2.4 Augmentation Sources

The water rights decreed to the Crested Butte Ltd. Pipeline (Sections 3.2.1), and the East River Pump Station (Section 3.2.2) are specified as water rights to be augmented in the District's plan

for augmentation decreed in Case No. 91CW49. Meaning that, these water right can continue to divert even when the downstream, calling water right is senior because based on the 1991 projection of District's build-out demands and anticipated river administration, there are sufficient augmentation supplies to replace the out-of-priority depletive impact.

The augmentation plan relies on three sources of replacement:

- **Return Flows:**
  The potable water supply that is delivered throughout the District's service area can be divided into two components. The portion of the supply that is consumed by the applied use, and a portion of the supply that is returned to the tributary stream system. For indoor domestic uses, the consumed portion is typically assumed to be 5-10% of the total supply, depending on whether wastewater is returned through a central treatment system (5%) or through a septic / leach field system (10%). Within the District, the non-consumed portion of the indoor supply is processed at District's wastewater treatment plant and returned to Woods Creek. The associated consumptive use rate, as set forth in Case No. 91CW49 is 5%. For outdoor uses, the consumed portion for a municipal provider is typically 80%, but can vary widely depending on the efficiency of the irrigation system. For example, a drip irrigation system may have an associated consumptive use as high as 100%, while an agricultural operation using flood irrigation practices may have an associated consumptive use of less than 50%. In Case No. 91CW49, the consumptive use rate for outdoor irrigation within the District is 80%, with the balance returning to the Washington Gulch drainage. Overall, the non-consumed portion of the indoor and outdoor water supply that returns back to the stream system can be applied towards offsetting or replacing the depletive impact.

  Of particular importance, as described in Section 3.1.2, the District's primary source of supply is diverted from the East River at the East River Pump Station. The non-consumptive portion of this diversion supply is subsequently returned to Woods Creek through the District's WWTP (indoor uses) and to the Washington Gulch watershed through the groundwater alluvium (outdoor uses). Consequently, as it relates to the depletive impact from diversions at the Crested Butte Ltd. Pipeline to Washington Gulch below its confluence with Woods Creek, and to the Slate River below its confluence with Washington Gulch, the overall return flow supply is significantly greater. Conversely, diversions at the East River Pump Station are 100% depletive to the East River above its confluence with the Slate River because none of the return flow supply is delivered to that reach.

- **Verzuh-Young Bifano Water Rights:**
  As outlined in Section 3.2.1, the District has a 2.0 cfs interest in the Verzuh-Young Bifano Ditch along with an easement to dry up a 20-acre tract that had historically been irrigated by the subject water rights. By taking this land out of production, the District is able to benefit in two ways. As it relates to the East River above its confluence with the Slate River, the District can divert up to 1.78 cfs at the East River Pump Station for all municipal uses, including irrigation. This diversion rate was calculated based on an estimated historical ditch

loss of 11% (2.0 cfs * 11% = 1.78 cfs). The availability of this exchange is limited to the irrigation season from May through September, and it cannot be diverted if the steam system below the confluence of the Slate River and East River is under administration. That said, when the stream system below the confluence is under administration, the District can apply up to 24.2 acre-feet (AF) of historically consumptive use credits toward the replacement of out-of-priority depletions.

- **Reservoir Storage:**
  When the return flow supply and the use of the Verzuh-Young Bifano water rights either by exchange or consumptive use credits is insufficient, the District's plan for augmentation in Case No. 91CW49 contemplated that additional out-of-priority depletions would be replaced by water supplies released from storage.

  In Case No. 83CW330, the District adjudicated a conditional water right to store up to 700 AF in the yet to be developed North Village Reservoir for municipal, augmentation, and snowmaking purposes with an appropriation date of June 11, 1982. This storage facility, as shown in ***Figure 9***, is located within the Washington Gulch watershed, and in the District's plan for augmentation decreed in Case No. 91CW49, it is contemplated to be used to supplement winter diversions at the East River Pump Station, and provide replacement water to augment summer depletions to the East River below the Slate River confluence. The District's next diligence filing associated with this storage right will be in January 2027. In addition, the District also has a contract with the Bureau of Reclamation for 98 AF in Blue Mesa Reservoir. This storage supply is available to replace river administration on the Gunnison River below its confluence with the East River.

  More recently, in 2015, the District entered into an agreement with the Upper Gunnison River Water Conservancy District for the long-term operations and joint use of Long Lake, which is also known as Meridian Lake Reservoir. The agreement allocates 300 AF of the approximate 431.85 AF of the active storage capacity to the District. This storage option is also located within the Washington Gulch watershed, as shown in ***Figure 9***. In its 2015 firm yield analysis of the reservoir, LRE Water concluded that a combination of water supplies originating from in-basin native runoff and diversions imported from Washington Gulch are sufficient both physically and legally to meet the anticipated water demands of the District and the Upper Gunnison River Water Conservancy District under full build-out conditions. This conclusion, though, relies heavily on imported water from Washington Gulch, as the yield from the contributing watershed area is extremely limited. The District, in exchange for 300 AF of storage capacity, has committed to constructing a new diversion system to improve the firm yield of Long Lake by importing water supplies from Washington Gulch. The District continues to work towards the design, permitting, and construction of this system.

3.2.5 Water Right Administration

Water rights administration in Colorado is governed by the Division of Water Resources. At a statewide level, DWR is managed by the State Engineer's Office. Regionally, the state has been divided into 7 river divisions based on mainstem drainages, and those divisions have then been subdivided into smaller districts. The District's water rights are all located within District 59 (Gunnison River North) of Water Division 4 (Gunnison River Basin) as shown in ***Figure 1***, and administration within these divisions and districts is managed by the Division Engineer's Office.

As it relates to evaluating the District's out-of-priority depletive impact, LRE Water reviewed DWR's historical record of river administration from 1994 through 2021 within the stream reaches that are tributary to the District's diverting structures. In addition to reviewing the historical call chronology, LRE Water also developed administrative flags based on the streamflow hydrology within each reach. It is LRE Water's experience that historical administration may not always be representative of future administration, and as such, these administrative flags provide a more conservative evaluation of the District's legal availability. Specifics related to LRE Water's administrative analysis within each stream reach are summarized below.

Crested Butte Ltd. Pipeline

The water rights decreed to the Crested Butte Ltd. Pipeline are subject to river administration within the following tributary reaches.

(1) Washington Gulch below Woods Creek
(2) the Slate River below its confluence with Washington Gulch
(3) the East River below its confluence with the Slate River
(4) the Gunnison River below its confluence with the East River

East River Pump Station

The water rights decreed to the East River Pump Station are subject to river administration within the following tributary reaches.

(1) the East River below the East River Pump Station
(2) the East River below its confluence with the Slate River
(3) the Gunnison River below its confluence with the East River

- **Washington Gulch Administration:**

  On Washington Gulch, there is potential administration during the irrigation season from senior agricultural water rights. In addition, the Colorado Water Conservancy Board (CWCB) has two minimum instream flow rights within this stream reach that have the potential to place a call when streamflow levels are below the decreed right.

  Historically, calls have been placed by senior agricultural water rights that are decreed to the Breem Ditch, Wilson Ditch, and Rozich Ditch during the months of July, August, September, and October. For modeling purposes, LRE Water assumed that during the 28-

year period of record from 1994 to 2021, Washington Gulch would be on call from July 15th to October 15th in extremely dry years (2002, 2012, 2018, and 2021), and from August 1st to September 30th in dry and average years. These agricultural water rights are senior to all three of the water rights decreed to divert at the Crested Butte Ltd. Pipeline, and as a result, the associated depletive impact would be out-of-priority.

In addition, LRE Water also evaluated the daily streamflow record that was developed for the Washington Gulch watershed against the flow rate decreed to the CWCB's water right. The more senior of the two instream flow rights is for 7.45 cfs within the reach from the Breem Ditch to the Slate River confluence. This right is limited to the irrigation season from May to September. The junior instream flow right is for 2.5 cfs from the headwaters to the Slate River confluence. This right is year-round. Based on its streamflow analysis, LRE Water modeled the senior instream flow right placing a call in August and September of most years, and the junior right placing a call in most winters, during the 28-year period of record. The water rights decreed to divert at the Crested Butte Ltd. Pipeline are all senior to the junior instream right, but are all junior to the senior instream right. As a result, the depletive impact would be out-of-priority when flows drop below 7.45 cfs.

Overall, river administration from agricultural and instream flow rights on Washington Gulch is anticipated to occur in August and September of most years, and begin earlier in the summer and extend later into the fall of extremely dry years. However, as described in Section 3.2.4, a significant portion of the District's total return flow supply is generated from East River diversions. As a result, the amount of water returned to Washington Gulch is in excess of the depletive impact, and therefore, additional water supplies are not anticipated to be needed.

- **Slate River Administration:**

On the Slate River downstream of the Washington Gulch confluence, administration is tied to the CWCB's instream flow right.

The instream flow right on the Slate River is in the reach from the Coal Creek confluence to the East River confluence. This instream flow right is for 23.0 cfs from April to November and 12.0 cfs from December to March. Historically, calls have been placed by this water right in the months of July, August, September, October, and November. For modeling purposes, LRE Water assumed that this reach of the Slate River would be on call from July 15th to November 30th in extremely dry years (2002, 2012, 2018, and 2021), and from August 1st to October 31st of average and dry years. LRE Water also evaluated the daily streamflow record that was developed for the Slate River against the flow rate decreed to the CWCB's water right. That said, the water rights decreed to divert at the Crested Butte Ltd. Pipeline are all senior to the CWCB's minimum instream flow right, and as such, the associated depletions would not be out-of-priority to this river administration.

- **East River (above Slate River) Administration**

On the East River above the Slate River confluence, there is potential administration during the irrigation season from senior agricultural water rights. In addition, the CWCB has a year-round minimum instream flow right.

Historically, there has been little administration on this reach of the East River. That said, in the dry year of 2012, the East River No. 2 Ditch placed a call from June 23rd to October 30th. Moreover, it is LRE Water's experience that as agricultural properties are sold, there becomes potential for more administration. New ownership may be less likely to work with neighboring irrigators. As such, for modeling purposes, LRE Water assumed that during the 28-year period of record from 1994 to 2021, this reach of the East River would be on call from July 1st to October 31st in extremely dry years (2002, 2012, 2018, and 2021), and from August 1st to October 15th in dry and average years. These agricultural water rights are senior to four of the seven water rights decreed to divert at the East River Pump Station. As described in Section 3.2.4, the District changed its interest in three water rights priorities decreed to the Verzuh-Young Bifano Ditch to allow for up to 1.78 cfs to be diverted at the East River Pump Station. This exchange can be operated whenever the East River above the Slate River is under administration from May to September.

In addition, LRE Water also evaluated the daily streamflow record that was developed for the East River above the East River Pump Station against the flow rate decreed to the CWCB's water right. The instream flow right in this reach goes from the Copper Creek confluence to the Slate River confluence, and is for 25.0 cfs from May to September and 15.0 cfs from November to April. In most winters, streamflow levels drop below 15.0 cfs, and during this period, three of the water rights decreed to divert from the East River Pump Station are senior to the instream flow right: the Gothic Ditch water right for 1.0 cfs, the Malensek Ditch water right for 0.50 cfs, and the original East River Pump Station water right for 0.10 cfs. Therefore, as it relates to the winter administration from a call placed by the CWCB's minimum instream flow right, the District can continue to divert up to 1.60 cfs at the East River Pump Station.

Overall, river administration from agricultural water rights on East River above the Slate River confluence is likely to occur in late summer and early fall of dry years, during which the District will rely on its Verzuh-Young Bifano exchange to divert up to 1.78 cfs at the East River Pump Station. In addition, river administration from the CWCB's instream flow right is anticipated to occur in most winters, during which the District's in-priority water right will allow for up to 1.60 cfs to be diverted at the East River Pump Station. The East River Pump Station, therefore, has a legal diversion limit of 1.78 cfs in the summer season and 1.60 cfs in the winter season. These limitations are referenced in the bottom half of ***Figure 5***.

- **East River (below Slate River) Administration**

  On the East River below the Slate River confluence, there is potential administration during the irrigation season from senior agricultural water rights.

  Historically, there has been little to no administration on this reach of the East River. In its 1991 report that recommended and set forth a water rights plan for augmentation that was ultimately decreed in Case No. 91CW49, LRE Water noted that a water right call was almost placed in the late summer of 1990, and the water commissioner at that time believed that a call during dry years had only been prevented because of common ownership of basin ranches and informal agreements between parties not to exercise a call. LRE Water concluded that these conditions should not be relied on in the future, and calls should be expected sometime after mid-July of dry years. For this water right master plan update, LRE Water used the daily streamflow record at the USGS East River at Almont gage to evaluate potential administration from senior agricultural water rights. Specifically, when the streamflow level in the months of July, August, and September dropped below 100 cfs, LRE Water modeled a call. Based on this streamflow analysis, during the 28-year period of record from 1994 to 2021, the reach of the East River below the Slate River confluence was under administration in September of most years and July through September of extremely dry years. This administration, as described in Section 3.2.4, would prohibit the District from using its Verzuh-Young Bifano exchange to divert up to 1.78 cfs from the East River Pump Station. However, the District would be able to use the consumptive use credits associated with the dry up of the 20-acre tract that had historically been irrigated by the subject Verzuh-Young Bifano water rights. In total, the District has 24.4 AF of historical consumptive use credits. This credit, though, has monthly limitations: 2.4 AF in May, 7.8 AF in June, 6.5 AF in July, 4.0 AF in August, and 3.5 AF in September.

  Overall, river administration from agricultural water rights on East River below the Slate River confluence is likely to occur in late summer and early fall of dry years. During this period of administration, the water rights decreed to divert at the Crested Butte Ltd. Pipeline would likely be junior to the calling water right, and unlike calls placed on Washington Gulch or the Slate River below the Washington Gulch confluence, the return flow supply would not be in excess of the depletive impact. The stream system below the confluence of the East and Slate Rivers is depleted by diversion from both the Crested Butte Ltd. Pipeline and the East River Pump Station, and receives the return flow supply from both sources. As a result, the net out-of-priority depletive impact from both the Crested Butte Ltd. Pipeline and the East River Pump Station must be augmented, and the depletive impact associated with the Crested Butte Ltd. Pipeline does not benefit from excess East River return flows. In addition, as it relates to the East River Pump Station, the District will not be able to use it Verzuh-Young-Bifano exchange to divert up to 1.78 cfs. It will, however, be able to use the historical consumptive use credits from the dry up of a 20-acre tract that had historically been irrigated under the Verzuh-Young Bifano Ditch.

- **Gunnison River Administration**

  On the Gunnison River below the East River confluence, there is potential administration from the Aspinall Storage Unit, the Uncompaghre Project, and the Redlands Canal. The Aspinall Storage Unit is owned and operated by the Bureau of Reclamation, and is one of four projects under the Colorado River Storage Project (CRSP) system. It includes three major dams (Blue Mesa, Morrow Point, and Crystal) and power plants located on the Gunnison River upstream from the Black Canyon of Gunnison National Monument. The Uncompaghre Project is a Federal Reclamation Project owned by the Bureau of Reclamation that is maintained and operated by the Uncompaghre Valley Water Users Association (UVWUA). The Uncompahgre Project consists of two primary structures: the Gunnison Tunnel and Taylor Park Reservoir. Water supplies from the Gunnison River and Taylor Park Reservoir are delivered through the Gunnison Tunnel for irrigation by the UVWUA. The Redland Canal is owned and operated by the Redlands Water and Power Company. The canal diverts water from the Gunnison River near its confluence with the Colorado River for irrigation and hydropower purposes.

  Of these diversion projects, only the Gunnison Tunnel has put the Gunnison River under administration. In the dry year of 2002, the Gunnison Tunnel placed a call from April 18th to October 1st, and in 2003 and 2015, calls were placed, but for a shorter period of time. For modeling purposes, LRE Water assumed that the Gunnison River would be on call from April 1st to October 31st in extremely dry years (2002, 2012, 2018, and 2021), and from July 1st to September 30th of average and dry years.

  Overall, river administration from these large diversion projects on the Gunnison River is likely to occur during the late summer and early fall of dry years, and throughout the irrigation season in extremely dry years. Then, as with river administration on the East River below the Slate River confluence, the net out-of-priority depletive impact from both the Crested Butte Ltd. Pipeline and the East River Pump Station must be augmented. The District, though, does have a contract with the Bureau of Reclamation for 98 AF in Blue Mesa Reservoir that can be used to augment downstream calls on the Gunnison River.

3.3 RELIABILITY OF THE WATER SYSTEM

In order for the District to reliably meet the potable demand within its service area the physically available water supply must also be legally available, and it must be able to meet the peak day demand, as well as the daily demand during extended periods of drought and river administration. LRE Water quantified this reliability by evaluating the peak day demand and the average daily demand at build-out against the water supply that the District can currently divert because it is both physically and legally available. For the peak day analysis, LRE Water calculated the total number of SFDs that the District's existing water supply system can support based on meeting either the peak day winter demand or the peak day summer demand. Then, the current number of SFDs was increased annually using a range of growth rates in order to estimate the timing (in

years) that it would take to reach a level of development wherein the District could no longer meet either the peak day winter demand or the peak day summer demand. In addition, LRE Water also used a spreadsheet-based water supply and demand model to calculate the ability of the District's current water supply system to meet the average daily demand at build-out over an extended period of hydrologic conditions, including dry and extremely dry years. This analysis quantified system shortages that would require the District to develop additional physical and/or legal water supplies. These analyses are described in detail in the following sub-sections.

3.3.1 Peak Day Demand

As described in Section 2.2.2, the current peak day demand is approximately 0.95 cfs in the winter and 1.71 cfs in the summer. LRE Water then used the current number of SFDs within the District's service area to calculate the peak day water use per SFD: the winter peak equals approximately 220 gpd (~614,000 gallons / 2,800 SFDs), and the summer peak equals approximately 400 gpd (~1,105,000 gallons / 2,800 SFDs).

During the winter season, it is estimated that the water supply that is available to divert at the Crested Butte Ltd. Pipeline is physically limited to a rate of approximately 0.10 cfs (Section 3.1.1). In addition, it is estimated that the water supply that is available to divert at the East River Pump Station during the winter season is legally limited to a rate of approximately 1.60 cfs (Section 3.2.5 under East River above Slate River Administration). In total, the District can currently depend on a reliable winter diversion rate of 1.70 cfs, and based on this rate, the District's current water supply system can support the development of approximately 2,200 additional SFDs (1.70 cfs / 0.00034 cfs per SFD) for a total of 5,000 SFDs (2,800 current SFDs + 2,200 future SFDs). However, at build-out, the District will need a greater supply to meet the peak day winter demand for 6,200 SFDs. That said, it will take the District more than two decades to exceed the 1.70 cfs peak day winter demand based on a range of annual growth rates from 1.0% to 2.5%. This analysis is summarized in ***Figure 10***, which shows that at a high annual growth rate of 2.5% it will take approximately 23 years for development to exceed the peak day winter demand.

During the summer season, it is estimated that the water supply that is available to divert at the Crested Butte Ltd. Pipeline is physically limited to a rate of approximately 0.30 cfs (Section 3.1.1). In addition, it is estimated that the water supply that is available to divert at the East River Pump Station during the summer season is legally limited to a rate of approximately 1.78 cfs (Section 3.2.5 under East River above Slate River Administration). In total, the District can currently depend on a reliable summer diversion rate of 2.08 cfs, and based on this rate, the District's current water supply system can support the development of approximately 600 additional SFDs (2.08 cfs / 0.00061 cfs per SFD) for a total of 3,400 SFDs (2,800 current SFDs + 600 future SFDs). However, at build-out, the District will need a greater supply to meet the peak day summer demand for 6,200 SFDs. Moreover, this shortfall will occur much more quickly than the District's ability to meet the peak day winter demand at build-out. If the annual growth rate is on the higher end of 2.5% to 2.0%, the District's reliable water supply during the summer season will be exceeded in approximately 8 to 10 years. That said, at a more modest annual growth rate of 1.0%,

it be approximately 20 years before the summer peak day demand of 2.08 cfs is exceeded. This peak day summer analysis is summarized in ***Figure 11***.

3.3.2 Modeled Supply Gap

LRE Water had previously developed a spreadsheet model that projects the average daily water requirement within the District's service area based on a set level of development, and then evaluates the ability of the District's water supply system to adequately meet that demand. In particular, the model evaluates the legally available water supply using a representative estimate of future river administration that is based on a combination of the historical call record and the streamflow hydrology for a 28-year period of record from 1994 to 2021.

As it pertains to the water rights master plan update, LRE Water modeled the District's build-out conditions based on the development of 6,200 SFDs. The overall daily water requirement to meet this demand was then distributed between the District's Crested Butte Ltd. Pipeline and East River Pump Station structures in a multi-step process. First, the daily water requirement was attributed to the Crested Butte Ltd. Pipeline structure based on the average monthly diversion rates set forth in the District's plan for augmentation decreed in Case No. 91CW49. The remaining water requirement was then assumed to be diverted by the East River Pump Station. In the model, the only physical limitation applied to this structure was its existing pumping capacity of 2.3 cfs (1.5 MGD), and under build-out conditions, the average daily demand never exceeded this limitation. The total water supply attributed to each of the District's diversion structures was divided between the indoor demand and the outdoor demand, and subsequently allocated to the various water rights decreed to each structure in a senior to junior manner, up to the decreed diversion rate and/or other legal constraints of the water right. The purpose of distributing the diverted water supply by structure, demand type, and water right was to analyze the out-of-priority depletive impact to each of the five critical stream reaches identified in Section 3.2.5: Washington Gulch, the Slate River below Washington Gulch, the East River above the Slate River, the East River below the Slate River, and the Gunnison River.

The water supply diverted at the Crested Butte Ltd. Pipeline is depletive to four of the five critical stream reaches: Washington Gulch, the Slate River above East River, the East River below the Slate River, and the Gunnison River, and the water supply diverted at the East River Pump Station is depletive to three of the five critical stream reaches: the East River above Slate River, the East River below Slate River, and the Gunnison River. Within each of these critical reaches, as described in Section 3.2.5, there are water users with rights that are senior to the water rights decreed to the District's Crested Butte Ltd. Pipeline and East River Pump Station. As such, if one of these more senior users cannot fully divert their legal water right, then they can place a call on the river system. During these periods of river administration, the water supply that is diverted by the District's more junior rights is considered out-of-priority, and the associated depletive impact has to be augmented or the District must curtail its diversions.

The District's plan for augmentation in Case No. 91CW49 expressly allows for the replacement of out-of-priority depletions with the portion of the diverted water supply that is returned back to the stream system. Though, the amount of augmentation and the number of reaches that benefit from this replacement source is dependent on the type of demand. Within the District's service area, approximately 95% of the total water supply that is delivered to meet indoor demands is returned to Washington Gulch through the District's WWTP, and approximately 20% of the total water supply that is delivered to meet outdoor demands is returned to Washington Gulch through the groundwater system. As a result, the total return flow supply (from both indoor and outdoor uses) can augment the depletive impact to Washington Gulch, as well as all other stream reaches that are tributary to Washington Gulch. The East River above the Slate River is the only critical reach wherein a return flow supply does not accrue. After the application of return flow supplies (if available), the model seeks to use the District's other available sources of augmentation to meet any remaining out-of-priority depletions. These sources, as described in Section 3.2.4, include the historical consumptive use credit from dry-up of a 20-acre tract under the Verzuh-Young Bifano Ditch and contract water in Blue Mesa Reservoir. The historical consumptive use credits can be used to replace out-of-priority depletions to the East River below Slate River and to the Gunnison River, and the storage water in Blue Mesa Reservoir can be released to replace out-of-priority depletions to the Gunnison River.

Overall, the model showed the need for additional (physical and/or legal) reliability in three critical reaches: the East River above the Slate River, the East River below the Slate River, and the Gunnison River. In the reach of the East River above the Slate River confluence, the out-of-priority depletive impact that was not augmented and would have been curtailed, totaled approximately 55.4 AF in dry years and 20.2 AF in average years. Based on this analysis, at build-out, the District will need an additional 55.4 AF/year of water, by either developing a new source of augmentation that provides replacement water to the East River above the East River Pump Station, or developing a new source of potable water that does not divert from this reach. As described in Section, 3.2.4, there are two potential storage options that could meet this need: North Village Reservoir and/or Long Lake. The additional water supply created by these storage projects would also meet the augmentation shortage that was quantified in two critical stream reaches below the East River and Slate River confluence. In these reaches, the out-of-priority depletive impact that was not augmented, totaled approximately 47.7 AF in dry years and 22.2 AF in average years. A summary of the additional storage requirement by stream reach is shown in ***Figure 12***.

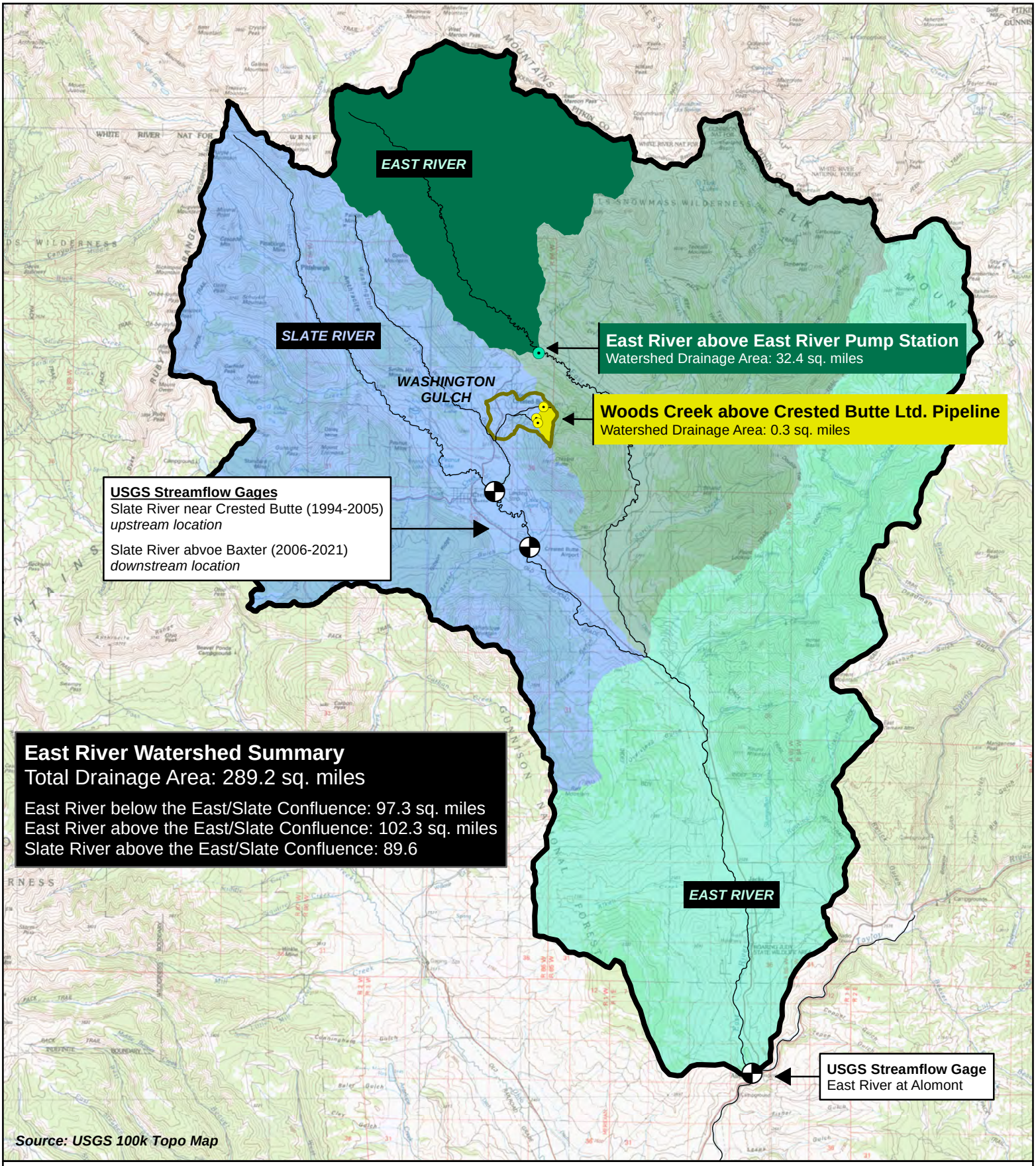


Figure 6: Watershed Area Map
Mt. Crested Butte W&SD Master Plan Update

LRE WATER

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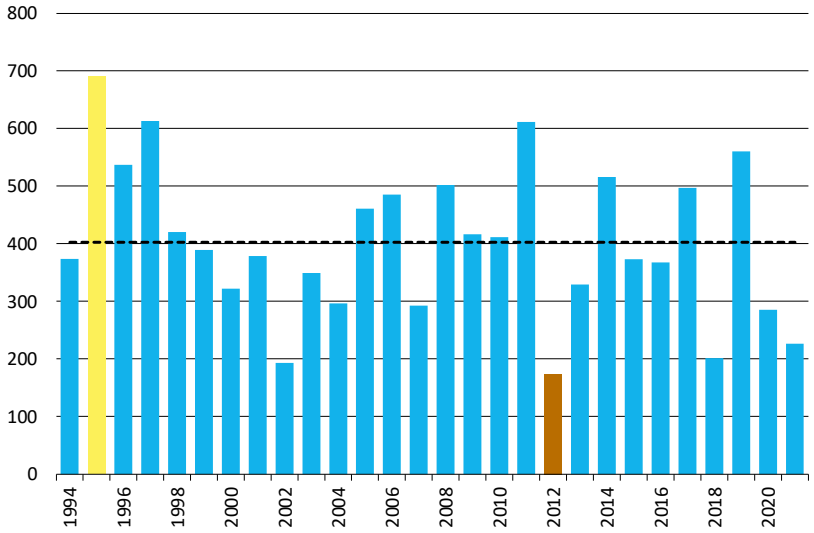
Date: 2024-04-10
File: 20165-1.7
Drawn: ANM
Approved: ANM

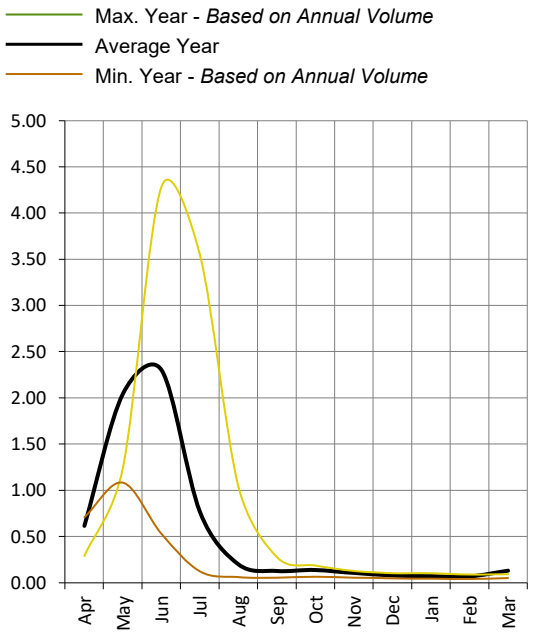
Figure 7: Woods Creek above Crested Butte Ltd. Pipeline
Streamflow Developed based on Unit Area Analysis of the USGS Slate River Gage

TOTAL ANNUAL VOLUME (AF)

Based on Average Monthly Streamflow



AVERAGE MONTHLY STREAMFLOW (cfs)

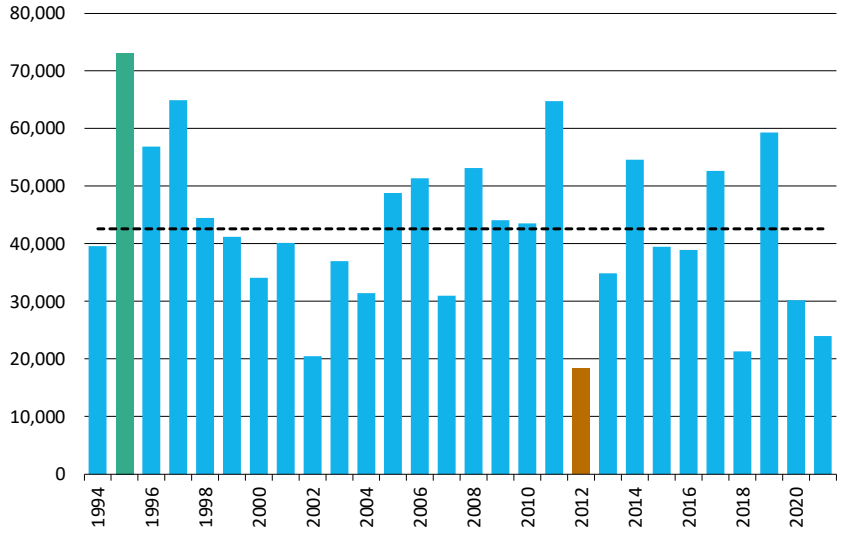


Water Year	Apr (cfs)	May (cfs)	Jun (cfs)	Jul (cfs)	Aug (cfs)	Sep (cfs)	Oct (cfs)	Nov (cfs)	Dec (cfs)	Jan (cfs)	Feb (cfs)	Mar (cfs)	Total (AF)
1994	0.58	2.39	2.14	0.32	0.10	0.08	0.14	0.11	0.07	0.06	0.07	0.12	374
1995	**0.29**	**1.24**	**4.29**	**3.55**	**1.04**	**0.28**	**0.19**	**0.13**	**0.11**	**0.10**	**0.09**	**0.09**	**690**
1996	0.73	3.42	3.01	0.74	0.17	0.12	0.13	0.13	0.09	0.08	0.08	0.18	537
1997	0.74	3.38	3.51	0.99	0.39	0.25	0.30	0.17	0.10	0.09	0.07	0.15	613
1998	0.40	2.01	2.42	1.24	0.21	0.07	0.10	0.10	0.07	0.07	0.07	0.20	420
1999	0.45	1.69	2.61	0.72	0.23	0.22	0.14	0.07	0.07	0.07	0.06	0.09	389
2000	0.65	2.33	1.47	0.28	0.08	0.08	0.09	0.07	0.06	0.05	0.05	0.09	322
2001	0.45	2.83	1.62	0.40	0.25	0.10	0.10	0.11	0.09	0.09	0.10	0.11	379
2002	0.80	1.09	0.59	0.08	0.03	0.08	0.14	0.09	0.08	0.07	0.06	0.09	193
2003	0.42	2.42	1.89	0.29	0.10	0.12	0.07	0.07	0.05	0.05	0.05	0.23	349
2004	0.57	1.87	1.41	0.40	0.06	0.08	0.10	0.09	0.08	0.08	0.07	0.09	296
2005	0.58	2.37	2.56	1.06	0.24	0.13	0.16	0.13	0.09	0.09	0.08	0.11	461
2006	0.86	3.07	1.99	0.51	0.18	0.16	0.37	0.20	0.11	0.11	0.13	0.30	485
2007	0.77	1.74	1.14	0.25	0.11	0.17	0.19	0.11	0.08	0.09	0.09	0.09	292
2008	0.37	2.39	3.54	1.22	0.23	0.09	0.09	0.07	0.07	0.06	0.06	0.11	502
2009	0.70	2.92	1.95	0.60	0.11	0.07	0.11	0.11	0.08	0.06	0.05	0.11	416
2010	1.11	1.66	2.70	0.41	0.20	0.08	0.09	0.13	0.13	0.10	0.08	0.13	411
2011	0.47	1.95	4.28	2.33	0.33	0.14	0.12	0.09	0.06	0.05	0.05	0.24	611
2012	**0.71**	**1.08**	**0.53**	**0.12**	**0.06**	**0.06**	**0.06**	**0.06**	**0.05**	**0.04**	**0.04**	**0.05**	**174**
2013	0.30	1.83	1.76	0.31	0.14	0.28	0.25	0.15	0.12	0.09	0.10	0.11	329
2014	0.97	2.14	3.11	0.85	0.21	0.27	0.27	0.16	0.11	0.09	0.09	0.26	515
2015	0.65	1.28	2.54	0.67	0.20	0.20	0.12	0.12	0.09	0.07	0.09	0.15	373
2016	0.63	1.61	2.55	0.45	0.15	0.09	0.09	0.09	0.07	0.06	0.07	0.24	367
2017	1.03	2.18	3.44	0.89	0.19	0.08	0.10	0.09	0.07	0.06	0.05	0.06	497
2018	0.46	1.52	0.68	0.11	0.04	0.03	0.16	0.08	0.06	0.06	0.05	0.07	201
2019	0.77	1.48	4.02	2.23	0.38	0.09	0.06	0.05	0.05	0.04	0.04	0.06	560
2020	0.37	2.07	1.61	0.26	0.06	0.06	0.04	0.05	0.04	0.05	0.05	0.06	285
2021	0.43	1.24	1.12	0.20	0.13	0.06	0.13	0.12	0.07	0.07	0.06	0.11	227
Avg	**0.62**	**2.04**	**2.30**	**0.77**	**0.20**	**0.13**	**0.14**	**0.11**	**0.08**	**0.07**	**0.07**	**0.13**	**402**
Max Yr.	0.29	1.24	4.29	3.55	1.04	0.28	0.19	0.13	0.11	0.10	0.09	0.09	**690**
Min Yr.	0.71	1.08	0.53	0.12	0.06	0.06	0.06	0.06	0.05	0.04	0.04	0.05	**174**

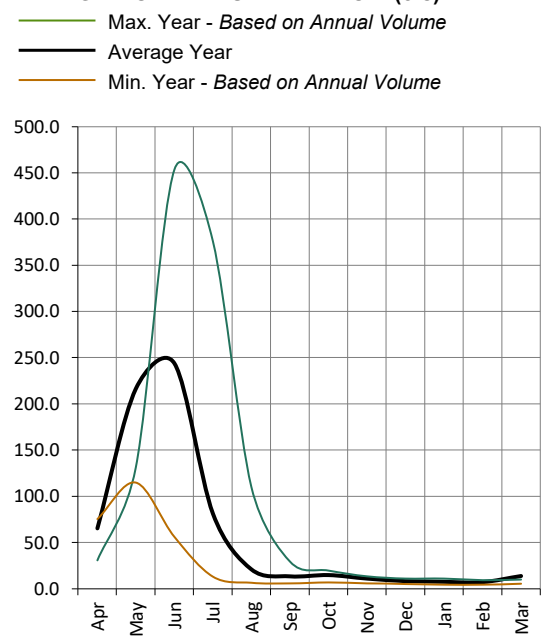
Figure 8: East River above East River Pump Station
Streamflow Developed based on Unit Area Analysis of the USGS Slate River Gage

TOTAL ANNUAL VOLUME (AF)

Based on Average Monthly Streamflow



AVERAGE MONTHLY STREAMFLOW (cfs)



Water Year	Apr (cfs)	May (cfs)	Jun (cfs)	Jul (cfs)	Aug (cfs)	Sep (cfs)	Oct (cfs)	Nov (cfs)	Dec (cfs)	Jan (cfs)	Feb (cfs)	Mar (cfs)	Total (AF)
1994	61.1	252.9	226.5	33.4	10.1	8.5	15.2	11.4	7.5	6.6	7.8	13.0	39,557
1995	**30.8**	**131.2**	**453.9**	**375.9**	**110.5**	**29.3**	**19.9**	**13.5**	**11.1**	**11.0**	**9.4**	**9.9**	**73,100**
1996	76.8	362.3	319.0	78.2	17.6	12.3	13.7	13.3	9.8	8.6	8.4	18.8	56,839
1997	78.0	357.8	371.6	105.1	40.8	26.2	32.0	17.9	10.2	9.6	7.1	16.0	64,916
1998	42.1	212.7	255.9	130.9	21.9	7.9	10.3	10.2	7.6	7.0	6.9	20.7	44,463
1999	47.9	178.9	276.7	76.4	24.8	23.2	15.2	7.8	7.4	7.7	6.5	9.2	41,177
2000	69.2	246.7	155.6	29.7	8.8	8.9	9.4	7.8	6.0	5.5	5.8	9.0	34,064
2001	48.0	299.6	171.0	42.6	26.4	10.9	10.3	11.9	9.0	9.5	10.1	11.7	40,096
2002	84.3	115.8	62.5	**8.4**	3.6	8.2	14.3	10.0	8.2	6.9	6.7	9.5	20,443
2003	44.9	256.1	200.4	30.7	10.7	12.9	7.2	7.0	5.6	5.1	4.8	24.7	36,980
2004	60.6	197.9	149.3	42.0	6.0	8.6	10.9	9.5	8.8	8.1	7.2	9.6	31,387
2005	61.1	250.6	270.7	112.6	25.4	14.2	17.1	14.0	10.0	9.3	8.9	11.8	48,780
2006	91.4	325.5	210.4	54.0	19.5	17.4	39.2	21.2	12.2	11.6	13.8	31.5	51,364
2007	81.2	184.1	121.1	26.6	11.7	17.8	20.4	11.3	8.8	9.4	9.0	9.8	30,934
2008	39.0	253.3	375.0	129.2	24.0	9.9	9.2	7.8	7.3	6.5	5.9	11.7	53,146
2009	74.0	309.7	206.0	63.0	11.3	7.9	11.3	11.9	8.7	6.1	5.4	11.7	44,082
2010	117.1	175.9	286.4	43.5	20.8	8.8	9.8	13.9	13.5	11.0	8.4	13.4	43,533
2011	49.3	206.4	452.9	247.2	34.5	14.3	12.9	9.8	6.6	5.8	5.5	24.9	64,739
2012	**75.3**	**114.9**	**56.1**	**13.0**	**6.4**	**5.9**	**6.9**	**6.0**	**5.1**	**4.6**	**4.4**	**5.5**	**18,392**
2013	31.8	193.7	186.6	32.9	14.9	30.0	26.0	16.2	12.6	9.8	10.4	11.6	34,864
2014	103.2	226.5	329.6	90.4	22.0	29.1	28.8	16.7	11.3	9.4	9.1	27.9	54,580
2015	68.6	135.9	268.9	70.6	21.1	21.4	12.3	13.0	9.4	7.9	9.5	15.9	39,471
2016	67.1	170.2	270.1	47.6	16.0	9.8	9.7	9.2	7.3	5.9	7.1	24.9	38,911
2017	109.3	231.0	363.9	94.6	19.8	8.3	10.6	9.1	7.0	6.4	5.3	6.8	52,619
2018	48.6	161.1	72.2	11.1	3.9	3.6	17.0	8.5	6.4	5.9	5.6	7.6	21,313
2019	81.5	156.6	425.6	236.3	40.1	9.7	6.8	5.8	5.1	4.3	3.7	6.1	59,306
2020	39.6	219.3	170.6	27.1	6.3	6.1	4.2	4.9	4.6	4.8	5.2	6.2	30,194
2021	45.9	131.6	118.8	21.6	14.2	5.9	13.7	12.3	7.9	7.6	5.9	11.2	23,986
Avg	**65.3**	**216.4**	**243.8**	**81.2**	**21.2**	**13.5**	**14.8**	**11.1**	**8.4**	**7.6**	**7.3**	**14.0**	**42,616**
Max Yr.	30.8	131.2	453.9	375.9	110.5	29.3	19.9	13.5	11.1	11.0	9.4	9.9	**73,100**
Min Yr.	75.3	114.9	56.1	13.0	6.4	5.9	6.9	6.0	5.1	4.6	4.4	5.5	**18,392**

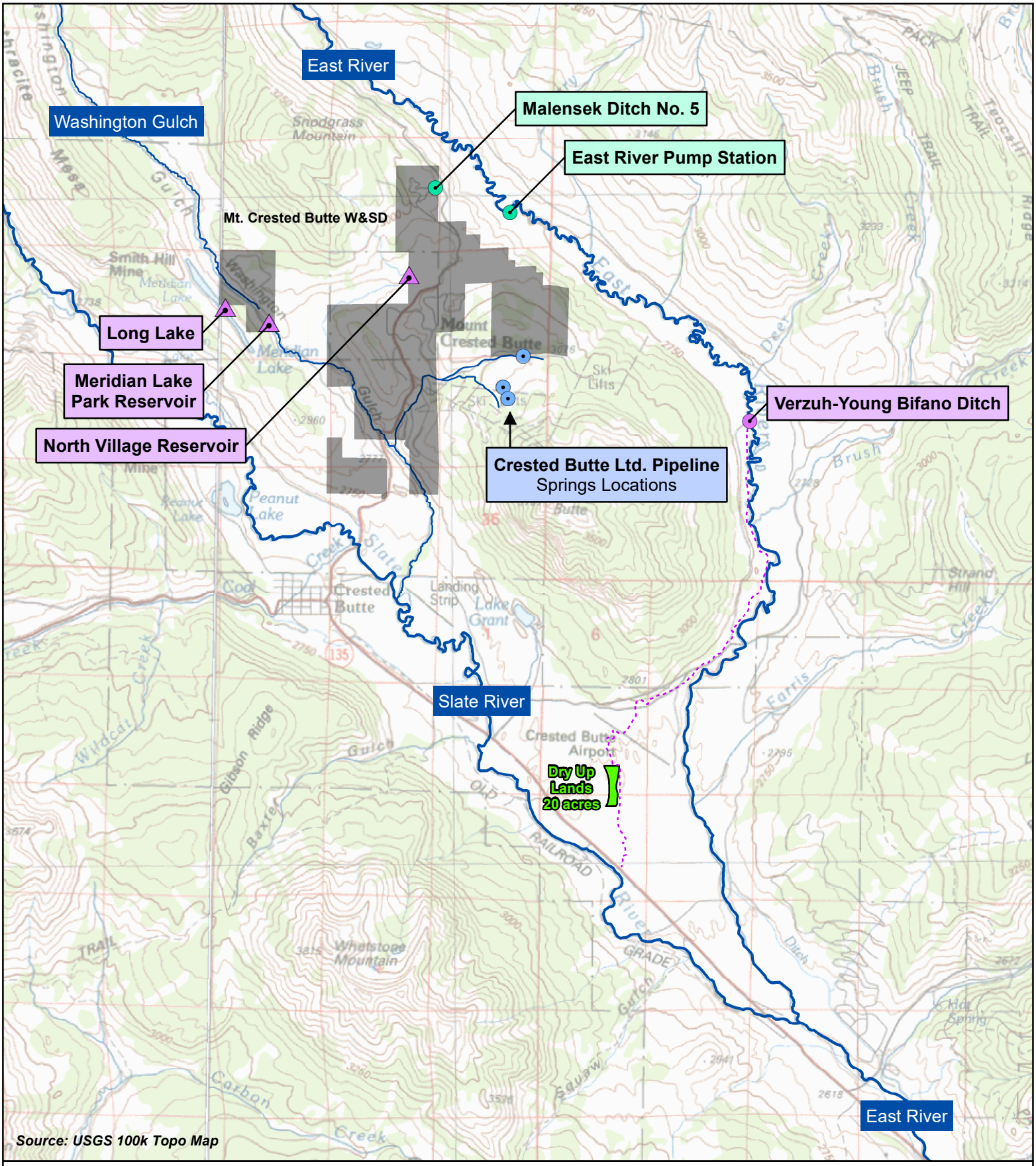


Figure 9: Water Right Location Map
Mt. Crested Butte W&SD Master Plan Update

LRE WATER

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Date: 2024-04-10
File: 20165-1.7
Drawn: ANM
Approved: ANM

Table 1
Water Right Summary

Mt. Crested Butte Water & Sanitation District							
Structure	**Source**	**Water Right**	**Decreed Amount**	**Administration Number**	**Appropriation Date**	**Adjudication Date**	**Decreed Uses**
Crested Butte Ltd. Pipeline	**Slate River**	APOD Malensek Ditch	1.50 cfs	26230.19888	1904-06-14	1924-01-07	Irrigation, Municipal, Domestic
		APOD Vuds Ditch	0.50 cfs	26230.23357	1913-12-13	1924-01-07	Irrigation, Municipal, Domestic
		Original Right	3.00 cfs	41175.00000	1962-09-25	1965-10-28	Irrigation, Municipal, Commercial Domestic
East River Pump Station	**East River**	*Verzuh-Young Bifano Exchange: 1.78 cfs*	0.50 cfs	28733.28275	1927-06-01	1931-07-06	During the irrigation season, VYB Exchange can be diverted at a rate of **1.78 cfs** for all uses. Cannot use if call is located below Slate-East River confluence.
			0.50 cfs	30667.28275	1927-06-01	1941-04-29	
			1.00 cfs	30667.30467	1933-06-01	1941-04-29	
		Gothic Ditch	1.00 cfs	39252.25397	1919-07-15	1961-01-27	Irrigation, Municipal, Domestic, Snow
		Malensek Ditch No. 5	0.50 cfs	39252.29675	1931-04-01	1961-01-27	Irrigation, Domestic
			3.00 cfs	39252.29675	1931-04-01	1961-01-27	Irrigation
		Original Right	0.10 cfs	47478.00000	1979-12-28	1979-12-31	Municipal
		1st Enlargement	2.50 cfs	51134.47478	1979-12-28	1990-12-31	Irrigation, Municipal, Commercial, Industrial, Fire, Domestic, Snow
Malensek Ditch No. 5	**East River**	1st Enlargement	5.00 cfs	50198.00000	1987-06-09	1987-12-31	Storage
		2nd Enlargement	2.00 cfs	59900.53552	1996-08-14	2014-12-31	Irrigation, Municipal, Commercial, Industrial, Fire, Domestic
			2.00 cfs	59900.58074	2008-12-31	2014-12-31	Snow
Verzuh-Young Bifano Ditch	**CU Credit**	*Consumptive Use Credits = 24.2 AF*	0.50 cfs	28733.28275	1927-06-01	1931-07-06	During the irrigation season, when the call is located below the Slate-East River confluence and the direct exchange cannot be operated, CU Credits can be used to augment out-of-priority depletions .
			0.50 cfs	30667.28275	1927-06-01	1941-04-29	
			1.00 cfs	30667.30467	1933-06-01	1941-04-29	
Blue Mesa Reservoir	**Storage**	*Leased Storage = 98 AF*					To augment an out-of-priority depletion below Blue Mesa Reservoir.
Meridian Lake Reservoir (Long Lake)	**Storage**	Original Right	138.58 AF	33356.19198	1902-07-25	1957-06-20	Irrigation, Municipal, Industrial, Domestic, Stock, Augmentation
		1st Enlargement	554.27 AF	39252.19198	1902-07-25	1961-01-27	Irrigation, Municipal, Industrial, Domestic, Stock, Augmentation
		Dead Pool	279.55 AF	44559.19198	1902-07-25	1972-12-31	Recreation, Fish, Wildlife
		Augmentation Right	407.21 AF	55882.55755	2002-08-26	2003-12-31	Irrigation, Municipal, Industrial, Domestic, Stock, Augmentation
		"NEW" JR. Storage Right	431.85 AF				
North Village Reservoir	**Storage**	Original Right	700.00 AF	48577.48374	1982-06-11	1983-12-31	Municipal, Augmentation, Snow

Figure 10
Peak Day Winter Water Demand Analysis

DIVERSION LIMIT:	**1.70 cfs**	1.60 cfs East River Pump Station, Legally Limited 0.10 cfs Crested Butte Ltd. Pipeline, Physically Limited
SFD CALCULATOR:	**0.00034 cfs/SFD** **220 gpd/SFD**	(Peak Day Demand / 2,800 SFDs)

5,002 SFDs	Total number of SFDs that can currently be supported with a 1.70 cfs Winter Diversion Limit.
2,800 SFDs	Current number of SFDs being served by the District.
2,202 SFDs	Additional number of SFDs that can be served by the District without new storage or augmentation supplies.

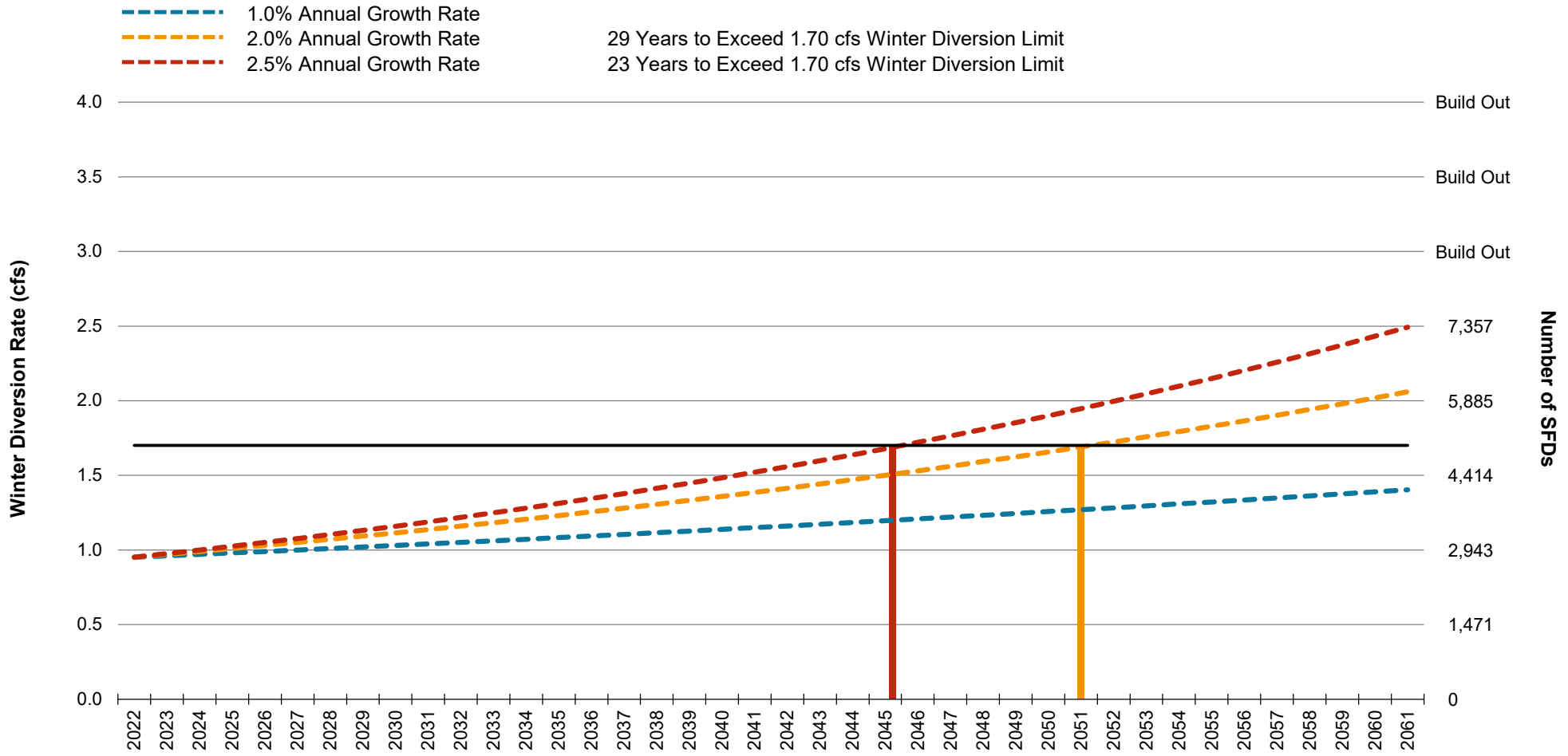
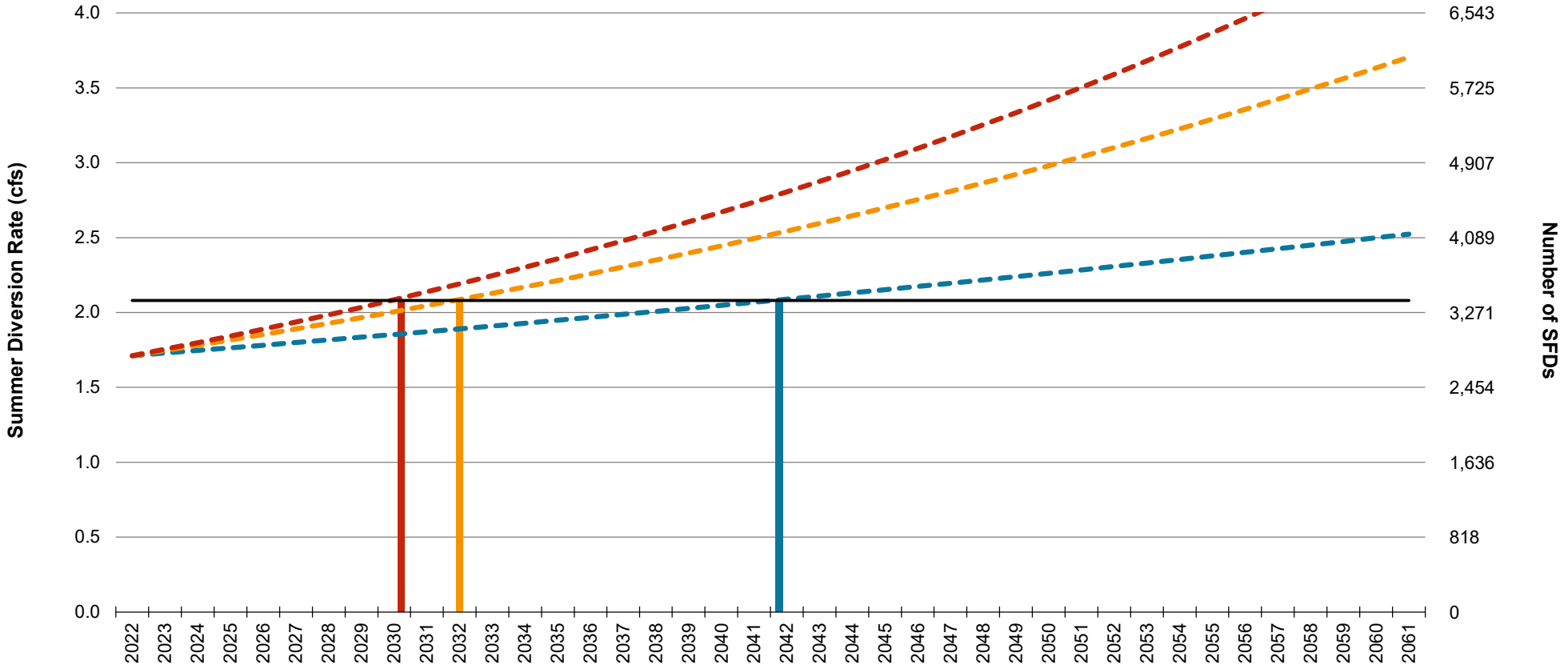


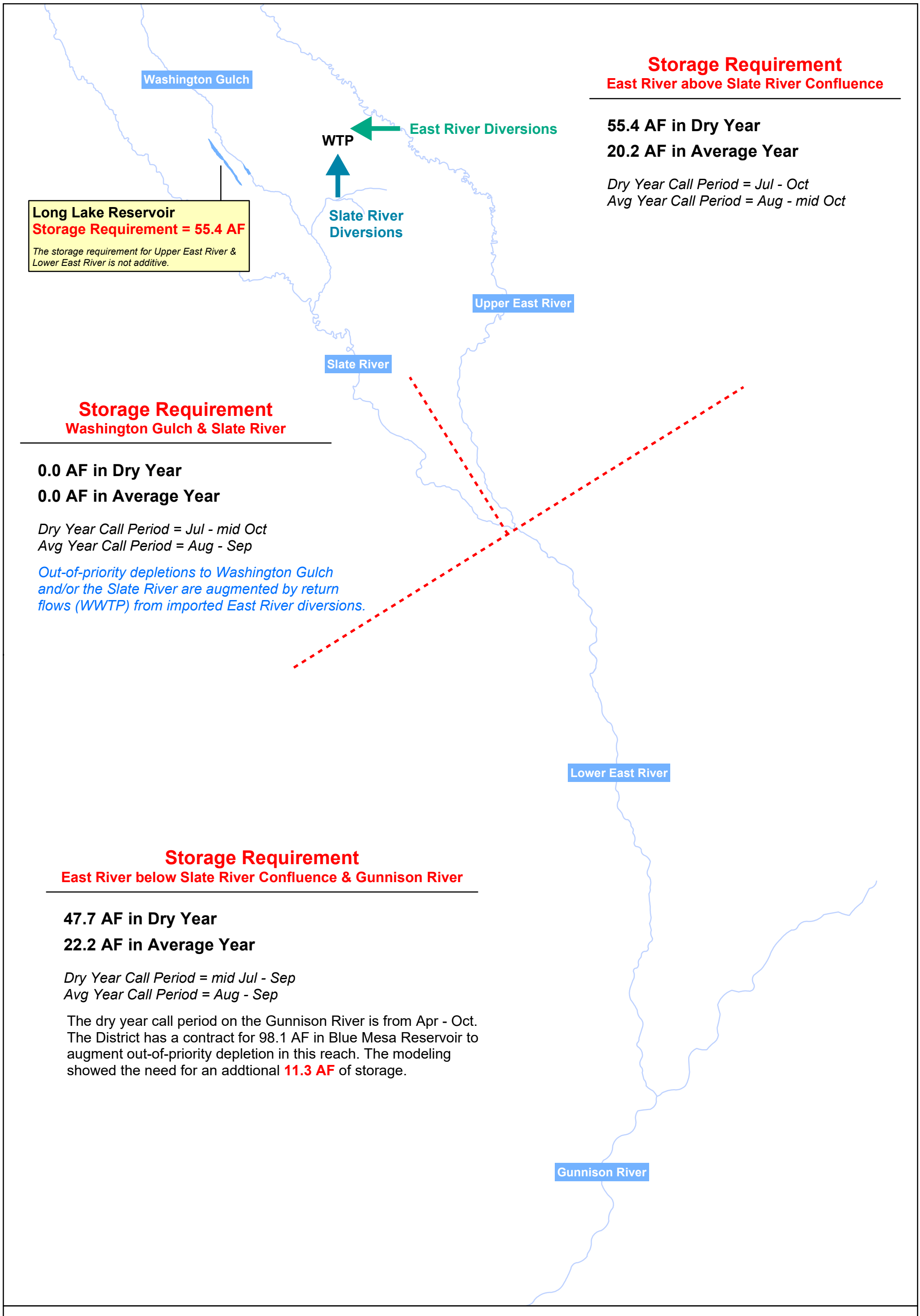
Figure 11
Peak Day Summer Water Demand Analysis

DIVERSION LIMIT:	**2.08 cfs**	1.78 cfs East River Pump Station, Legally Limited 0.30 cfs Crested Butte Ltd. Pipeline, Physically Limited
SFD CALCULATOR:	**0.00061 cfs/SFD** **400 gpd/SFD**	(Peak Day Demand / 2,800 SFDs)

3,402 SFDs	Total number of SFDs that can currently be supported with a 2.08 cfs Summer Diversion Limit.
2,800 SFDs	Current number of SFDs being served by the District.
602 SFDs	Additional number of SFDs that can be served by the District without new storage or augmentation supplies.

1.0% Annual Growth Rate	20 Years to Exceed 2.08 cfs Summer Diversion Limit
2.0% Annual Growth Rate	10 Years to Exceed 2.08 cfs Summer Diversion Limit
2.5% Annual Growth Rate	8 Years to Exceed 2.08 cfs Summer Diversion Limit





Storage Requirement
East River above Slate River Confluence

55.4 AF in Dry Year

20.2 AF in Average Year

Dry Year Call Period = Jul - Oct
Avg Year Call Period = Aug - mid Oct

Storage Requirement
Washington Gulch & Slate River

0.0 AF in Dry Year

0.0 AF in Average Year

Dry Year Call Period = Jul - mid Oct
Avg Year Call Period = Aug - Sep

Out-of-priority depletions to Washington Gulch and/or the Slate River are augmented by return flows (WWTP) from imported East River diversions.

Storage Requirement
East River below Slate River Confluence & Gunnison River

47.7 AF in Dry Year

22.2 AF in Average Year

Dry Year Call Period = mid Jul - Sep
Avg Year Call Period = Aug - Sep

The dry year call period on the Gunnison River is from Apr - Oct. The District has a contract for 98.1 AF in Blue Mesa Reservoir to augment out-of-priority depletion in this reach. The modeling showed the need for an addtional **11.3 AF** of storage.

Figure 12: Storage Requirement Analysis
Mt. Crested Butte W&SD Master Plan Update

LRE WATER

Miles
0 2.5 5 10

Date: 2023-05-11
File: 20165-4.14
Drawn: ANM
Approved: ANM

SECTION 4: ADDITIONAL CONSIDERATIONS

1. Climate Change Considerations: A USGS study[1] published in 2020 states that "over the course of the last century, the naturalized flow from the Upper Colorado Basin has decreased by about 20 percent as a result of an average increase of about 1.4 degrees Celsius (2.5 degrees Fahrenheit)." The study estimates that the naturalized flow will continue to decrease at a rate of 9.3% for every one-degree Celsius warming (5% for a one-degree Fahrenheit warming), and based on the warming rates from global climate models, the total decrease in flow by 2025 (compared to historical) is projected to be between 14 to 31%. The impacts of climate change are real; however, the timing and magnitude is uncertain and difficult to project at a local level. That said, the most likely impacts to the District's water supply system from climate change would be:

    a. Decreased Snowpack & Change in the Timing and Magnitude of Streamflow
    b. Increased Irrigation Demands, Evaporation & Transpiration
    c. Increased Drought Risk

    A reduction in the overall snow water equivalent (SWE), as well as factors that adversely affect how the snowpack melts (dust on snow, winds, temperatures) will alter the timing and magnitude of streamflow conditions. Specifically, runoff will occur earlier, and the peak flow will be less. In addition, the warmer temperatures associated with climate change will cause higher evaporation and transpiration rates, which in turn will increase (1) the water requirement for outdoor and agricultural irrigation, (2) the duration of the irrigation season, (3) the amount of runoff that is captured by drier soil conditions and not delivered directly to the stream system, and (4) evaporative losses from reservoir storage.

    RECOMMENDATION: These climate change impacts have the potential to affect both the legal and physical water supply that can be delivered to the District's existing potable system. Physically, the springs that supply the Crested Butte Ltd. Pipeline could recede to rates less than the seasonal limits that were modeled in the master plan (0.10 cfs in the winter and 0.30 cfs in the summer). The District should therefore continue to monitor the diverted supply, and consider maintaining a daily record in order to better assess the minimum and maximum available use by season. Additionally, while the District has designed a proposed diversion system from Washington Gulch to Long Lake with a pumping capacity greater than the 2 cfs that LRE Water modeled in its firm yield analysis of Long Lake, the District should continue to monitor and evaluate stream conditions on Washington Gulch. A reduction in snowpack is more likely to impact the Washington Gulch drainage than the East River drainage. As such, the timing and magnitude of the available water supply that LRE Water modeled as being delivered from Washington Gulch to Long Lake may change. Then, from a legal perspective, the District should continue to monitor and

[1] https://www.usgs.gov/mission-areas/water-resources/science/atmospheric-warming-loss-snow-cover-and-declining-colorado

evaluate stream conditions on the East River both above and below the Slate River confluence. In particular, if river administration becomes more frequent in this reach, the District should reevaluate the master plan analysis.

2. System Redundancy: In the western United States, forest wildfires have increased profoundly in frequency, severity, and size over the last four decades[2,3]. Severe wildfires can cause significant changes in forest vegetation and soil conditions, therefore altering watershed processes that control downstream water quality including soil erosion and nutrient export. Many short-term postfire studies have found consequential increases in sediment, nutrients, metals, and ions in stream water[4]. Postfire water quality degradation poses substantial risk to municipal water supplies and challenges water treatment operations.

   As described throughout this report, the District currently relies on two main sources of supply to meet its year-round and peak day water demands; the Crested Butte Ltd. Pipeline which consists of a series of springs that originate from the Woods Creek drainage near Crested Butte Mountain, and diversion from the East River at the East River Pump Station. In addition, the District's potable water system also receives supplies from the East River through the Malensek Ditch. In total, the East River currently supports 80% of the District's potable water supply. Consequently, if a wildfire were to occur in the upper East River watershed, the District's potable water system would be severely impacted.

   RECOMMENDATION: The District should investigate the development of a new source of supply in the Washington Gulch watershed basin. This new source would provide an additional physical supply to the District's water treatment plant, and would not necessarily be developed as an augmentation supply. Potential options include (1) storage from Long Lake and/or Meridian Lake Park Reservoir, (2) if feasible, the improvement or expansion of the Crested Butte Ltd. Pipeline system, (3) the development of groundwater well(s).

3. Colorado Compact Considerations: The Colorado River basin begins in the headwaters of western Colorado and terminates in the Gulf of California. The supply from this basin supports water users in Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, California, and Mexico. In 1922, the Colorado River Compact was signed, which allocated a total annual water supply of 15 million acre-feet (MAF) between upper basin and lower basin states. At the time, the allocation of this supply was assumed to be equitable by allowing the upper basin states of Wyoming, Colorado, Utah, and New Mexico to annually deplete 7.5 MAF, while delivering 7.5 MAF to the lower basin states of Nevada, Arizona, and California. However, the ability of the Colorado River to support this level of demand

[2] https://doi.org/10.1002/2014GL059576

[3] https://doi.org/10.3390/rs12182959

[4] https://doi.org/10.1071/WF17115

was based on a period of wet hydrology. Moreover, pursuant to a 1944 treaty, an additional 1.5 MAF was allocated to Mexico (total allocated = 16.5 MAF). Recent data suggests that the natural streamflow of the Colorado River is closer to 12.5 MAF/year: 2012-2021 average = 11.7 MAF/year, and 1991-2021 = 13.3 MAF/year.

Despite the annual water supply being less than projected, a compact call has not been issued by the lower basin states, requiring the upper basin states to curtail diversions. Historically, the lower basin states benefited by receiving Colorado River supplies from the combined Lake Mead and Lake Powell storage systems, and by the upper basin states using less than 7.5 MAF annually (3.5 to 5.0 MAF/year). The Lake Mead and Lake Powell storage system, however, hit a critical juncture during the 2000-2005 drought, and those reservoirs may not continue to provide a buffer to address demands by the lower basin states.

The District's water supply system is located within the Gunnison River basin, which is tributary to the Colorado River basin. As such, the District's water rights that have an administrative priority junior to 1922 could be curtailed by a compact call.

RECOMMENDATION: The District should stay up to date on matters related to the Colorado River Compact. At a local level, the District should monitor meeting agendas, attend presentations, and participate in outreach sponsored by the Gunnison River Basin Roundtable. In addition, the District should also engage with its Gunnison County representative on the Colorado River District board, and if practical, attend local and regional presentations and work sessions. Staying up to date and engaged may enable the District to influence future guidelines and administration.