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V. Water Supply Plan

A. Introduction.

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The following report outlines the water supply plan in accordance with the requirements of Section 12-105 of the Gunnison County Land Use Resolution. The purpose of the report is to demonstrate that the water supply is sufficient in terms of quality, quantity, and dependability for the Whetstone Affordable Housing development (Development) proposed at 25115 State Highway 135, Gunnison County, Colorado.

After evaluating the water supply options outlined below, the Development proposes connecting to the Town of Crested Butte water distribution and wastewater collection systems.

B. Connection to Existing Systems

It is the policy of Gunnison County to encourage development projects to use an existing water system. There are three existing water supply systems near the subject property. The Town of Crested Butte Public Works Department maintains a water treatment and distribution system. The boundary of the existing system is approximately two miles from the site. According to Chapter 13, ARTICLE 1, Section 13-1-280 of the Crested Butte Municipal Code (version dated May 4, 2022), the town permits the extension of town systems outside town boundaries. To connect to the Town of Crested Butte system, an applicant outside the town boundaries incurs the cost of all feasibility and engineering designs as well as the costs incurred by the town including attorneys' services, filings, and town staff time. In addition to the design, the project would require paying for the installation of a two-mile water line following Highway 135 as well as the associated easements and improvements. After construction, the water user is required to pay a monthly service rate two the in-town rate.

The water system maintained by the Larkspur Water Association is located approximately half a mile away across Highway 135 up Brush Creek Road. Though the system meets the Colorado Primary Drinking Water Regulations definition of "public water system," it is a privately owned system that serves the Larkspur subdivision. According to the subdivision's *Declaration of Protective Covenants*, declarants can expand the water system beyond the original Larkspur plat, but the declarants must supply new amounts of water to the system and pay all costs of necessary upgrades to the system. Therefore, the Larkspur system is not believed to have adequate excess capacity to serve the Development.

The third nearby water supply located one mile away from the site, Skyland Metropolitan District, has a formal policy (Rule 9.1 of the *Second Amended and Restated Rules and Regulations for Skyland Metropolitan District*, Gunnison County, Colorado, effective May 1, 2017) against the inclusion of new lands into the district. A separate rule (Rule 4.1) states that the district will only accept extensions when the lines can be placed wholly within roadways owned and maintained by the district. The Development does not have access to



Skyland Metropolitan District roadways and cannot be incorporated into the district. Accordingly, a connection to this nearby existing water system is not feasible.

C. Installation of Water Supply System.

The preference is to connect to the Town's infrastructure for water supply. Gunnison County and the Town of Crested Butte will need to agree to a Memorandum of Understanding to "explore the feasibility of extension of municipal water and sanitary sewer infrastructure to the Whetstone Parcel." The Town has contracted with Carollo Engineers to perform a water and sewer capacity study to confirm the capacity of the Town's water and sewer infrastructure. The report from Carollo Engineers (dated July 5, 2022) is attached and states that with the Development "the [water treatment plant (WTP)] capacity could be exceeded during the peak day condition by 2036... [and] a WTP expansion project to accommodate the additional demand may or may not be necessary to accommodate this scenario." The uncertainty in the report is due to the assumed peak demand. The peak demand was provided by a 2018 report when potable water was used for irrigation. Potable water is no longer used for irrigation and therefore the peak demand has likely decreased. More analysis is needed to determine the accurate peak demand and project when the WTP capacity will be exceeded.

The report evaluates two utility corridors along Highway 135 that would allow the Development to be connected to the existing distribution system. The report assessed two viable locations to connect to the existing distribution system. Additionally, the report states that "an onsite booster pump and chlorination system may be required to meet the minimum pressures and chlorine residual for daily use." Because a hydraulic model does not exist to analyze the fire flow in the existing service area, the report suggest that dedicated onsite fire pumps and storage may be required for fire suppression. Town and County staff met on during the summer of 2022 to discuss the report and the County has submitted a request for extension of services to the Town of Crested Butte. The request is required to be reviewed under Municipal Code, Chapter 13.

The other option is for an on-site water supply system to be developed to provide the domestic and fire protection water for the project. The developed water supply would need to comply with the County's regulations and the standards of the Colorado Department of Public Health and the Environment. According to the Colorado Division of Water Resources, there is an existing well (WPN 205084-A) located in the north corner of the site near Highway 135. The well was drilled on February 25, 2005, with a well test showing a production rate of 25+ gallons per minute (gpm) and a permit to pump 15 gpm for domestic use.

Based on the proposed number of units and site plan, it is estimated that the average daily demand for domestic water will be 56gpm and the estimated peak hour demand is 336gpm. Fire flow requirements will likely be 2000 gpm for a 2-hour duration or about 240,000 gallons of stored water (This fire flow rate will need to be reviewed by the Crested Butte Fire Protection District). To meet the demand for the Development, at least one addition well would need drilled. Additionally, the site would be required to have 310,000 gallons of water storage to meet the fire flow and one day of average demand requirements. Based on the



number of units on the proposed site, the associated domestic water and fire flow demand, the site can adequately supply water for a private system if at least one additional well is drilled.

The proposed option of connecting to the existing Town of Crested Butte water system is the most feasible solution and is the option that the County is pursuing.

D. Calculation of Adequacy of Supply.

a. Demand Summary:

Residential Demand:

The Development proposes approximately 231 residential units. The Gunnison County Land Use Resolution (Section 7-201.V.3.g.1) stipulates that demand calculations should be based upon 350 gallons per day (gpd) per year-round residence. Based on an estimated 231 units and assuming year-round residency, the average domestic potable use is equal to 80,850 gpd.

Commercial Demand:

It is assumed that the planned community buildings (estimated at 9,000 square feet) will include office space for management of the community. The anticipated commercial use is 0.1 gpd per square foot. The total average daily commercial demand will be 900 gpd.

Irrigation Demand:

Approximately 2.0 acres of the current site are planned as greenways and parks with native ground cover, shrubs, and grasses. Based on the National Resource Conservation Service Irrigation Guide Colorado State Supplement, the site is in Climate Zone 7 and the peak consumptive use for grass is 0.14 inches per day. Assuming a 4-month irrigation season, this project will require 0.4 ac-ft of water per month. This would equate to an average daily (summer) demand of 4,500 gpd. The County owns 30 base units of augmentation water in Meridian Lake that could be used for irrigation.

Fire Flow:

Fire flow requirements shall be related to the location and character of the Development and shall comply with the standards of the National Fire Protection Association (NFPA). The site may be required to install a fire hydrant system that meets the standards of the applicable fire protection district. Fire hydrants will be spaced no more than 1,000 feet apart and the site will comply with access requirements.

At this time, the fire flow requirement is expected to be 1,500 gpm for the smaller Triplexes and up to 4,000 gpm for the larger apartment buildings. These numbers are based on the tables in Appendix B of the 2018 International Fire Code. This required fire flow will be further defined with a preliminary plan.



b. Section 12-105 Required Calculations

1. ESTIMATED AVERAGE DAILY DEMAND.

The estimated average daily demand of the entire service area and the proposed Development is 80,850 gpd. Demand calculations are based on 350 gallons per day (gpd) per residence.

2. ESTIMATED MAXIMUM DAILY DEMAND.

The estimated maximum daily demand based on using three times the average daily demand is 242,550 gpd.

3. ESTIMATED PEAK HOUR DEMAND.

The estimated average daily flow rate is approximately 56 gpm. The estimated peak hour demand based on using six times the average daily demand is 336gpm. The pumping and distribution system from the storage tank will be sized to accommodate this peak one-hour flowrate. The controlling factor for the pipe distribution network will be the fire flow rate once determined with input from the Fire District.

4. ESTIMATED AVERAGE DAILY DEMAND FOR COMMERCIAL / INDUSTRIAL USES

It is expected that commercial uses will require 900 gpd. There are no industrial uses on the site.

5. WATER SUFFICIENT FOR LANDSCAPING

The project will comply with Section 13-111 of the Land Use Resolution by providing a landscape plan. It is anticipated that the plan will include approximately 2 acres of landscaping both between buildings and as a buffer to surrounding properties. At least one tree and three shrubs will be provided for each 500 sq. ft. of the area that is shown as being landscaped. All areas not dedicated to trees or shrubs will be landscaped with grass, ground cover, or other appropriate landscape treatment. The daily demand is expected to be 4,500 gpd.

6. ADEQUATE AND RELIABLE WATER SUPPLY

The Development is required to have a water supply that is sufficient and accessible year-round to control and extinguish anticipated fires. At this time, the structures on the Development are expected to be classified as Type II construction and as occupancy hazard R-2 according to the National Fire Protection Association (NFPA) *Standard on Water Supplies for Suburban and Rural Fire Fighting*. As stated above, the fire flow requirement is estimated to be between 2,000 and 4,000 gpm.

According to the infrastructure capacity report provided by Carollo Engineers dated July 5, 2022, it is necessary to develop a distribution system hydraulic model to determine the available fire flow the existing service area and the Development connection. It is anticipated that the “fire flow requirements may



need to be met through dedicated fire pumps and onsite storage for fire suppression, as it may not be feasible to supply the anticipated 2,000 gpm fire flow demand for 2 hours” from the Town of Crested Butte distribution system. The pipe and service lines connecting the Development to the existing water system will be sized to provide adequate fire flows to the site.

Additionally, the site will comply with the local fire protection district requirements and the site will have an indicator that is visible in winter and approved by the fire protection district to identify where water may be extracted for fire protection district emergency use. The site will provide a secondary water supply if the county determines that it is required.

E. Compliance with Colorado Drinking Water Standards.

The Town of Crested Butte water system is permitted through the Colorado Department of Public Health and Environment (CDPHE). The treatment plant permit number is CO0020443. It is believed that the existing treatment system complies with the Colorado Drinking Water Standards and that the treatment plant regularly reports the results of water samples in compliance with the CDPHE Primary Drinking Water Standards. According to the infrastructure capacity report provided by Carollo Engineers (dated July 5, 2022), the inclusion of the Development demands may cause the water treatment plan capacity to be exceeded by 2036. The project may require a plant expansion to accommodate additional demand, or the town could implement a water conservation program to decrease peak day demand conditions. Additional assessment is needed to determine if a chlorination system is required at the Development property to meet chlorine residuals for daily use.

F. Water Rights.

This site currently has possession of 30 base units of augmentation water rights that equalates to 15 acre-ft or 653,400 cf.

W. Sewage Disposal

A. Introduction.

Per section 12-106, a method of sewage disposal is required at the proposed site and must comply with all applicable standards of the Gunnison County Land Use Resolution, the Gunnison County On-Site Wastewater Treatment System Regulations, and the Colorado Department of Public Health and Environment. There are two feasible options for wastewater treatment at the proposed site. While the site is not located within 400 feet of an existing system or in an urban service area, the preferred option is to connect to the existing Town of Crested Butte wastewater treatment system.



B. Connection to Existing Systems

The project's preferred connection is to The Town of Crested Butte's existing sewer system located two miles from the proposed site. The report by Carollo Engineers (dated July 5, 2022) analyzes the impact of the Development on the existing wastewater treatment plant (WWTP) and sewer system capacity. The report notes that the Town of Crested Butte is in the process of implementing a Disconnection Program which will disconnect residential groundwater sump pumps from the collection system and reduce influent flows to the wastewater treatment plant. The report states that "assuming successful implementation of the Disconnection Program, the WWTP will not reach 80 percent, 95 percent, or 100 percent of its permitted capacity until sometime after 2040, even considering the additional flow from the Development." If that program does not reduce influent flow to the WWTP by a minimum of 0.3 mgd, a WWTP expansion will be required to accommodate the additional hydraulic capacity due to the Development. The report finds that "the WWTP has ample organic loading capacity available" and the project "is not expected to trigger WWTP expansion prior to 2040 due to the organic permit limitations." More modeling is needed to understand how the Development will impact the treatment process. The report also proposes two utility corridor routing options to convey wastewater from the Development to the existing collection system. The report assumes a lift station at the Development property will be required. The report assessed three connection points to the existing collection systems, but a field survey of the existing manhole inverts is needed to understand capacity limitations within the existing collection system.

The alternative option is to connect to the East River Regional Sanitation District treatment plant. While this option has been considered, it is the least preferred alternative due to the significantly higher augmentation requirement created by delivering wastewater return flows from the Slate River basin to the East River basin and the ongoing maintenance costs.

C. Use of On-site Wastewater Treatment System

The alternative to connecting to an existing system is to design, permit and build an on-site system. This system would be required to meet all CDPHE's criteria for design, construction, and plant operation. A central onsite treatment facility would need to treat a daily demand of approximately 82,000 gallons per day and would need to be designed have a capacity of 98,400 gpd (20% increase).

The project will have a density greater than one unit per acre. Therefore, the Preliminary Plan application would require engineering and economic evaluation of the feasibility of providing a central wastewater treatment facility for the Development. The county approval process would require an impact assessment, cost analysis, soil evaluation, and county review. If county approval is granted, the developer would pay all associated engineering costs and treatment plant costs. At this time, the space requirement of the treatment system makes connecting to the existing Town of Crested Butte system more feasible.

Sincerely,



JVA, INCORPORATED

By:

JR Spung, P.E.
Senior Project Manager

