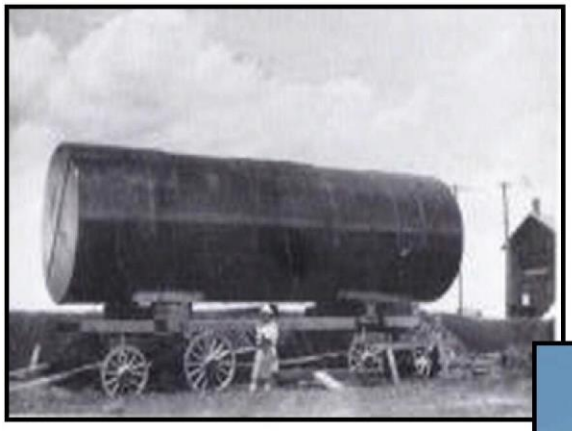

TOWN OF KEENESBURG, COLORADO
Water System Improvements

Feasibility Study for CWCB Loan Application

July 2022

Prepared By: Thomas M. Dea, P.E.

COLORADO WATER WELL

2001 E. 58th AVE.
DENVER, CO. 80216
(303) 892-9053

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FEASIBILITY STUDY FOR THE CWCB LOAN APPLICATION

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A. INTRODUCTION

The Town of Keenesburg (Keenesburg) has been planning and executing a plan to supplement its water supply sources and improve the water quality since the early 2000s. The Town's current water supply comes from 6 wells that draw from the Laramie Fox-Hill aquifer and in 2006 Keenesburg purchased and connected one well that is located in the alluvial aquifer of the Lost Creek Designated Basin. The alluvial well and all current LFH wells are located inside the Lost Creek Designated Basin Management District. The Laramie-Fox Hills (LFH) water has elevated fluoride and sodium levels. In 2006, after purchasing the rights to one alluvial well, Keenesburg began modifying plumbing from all of the LFH wells so that water from the alluvial well and LFH wells could be blended and treated at a common point prior to entering the distribution system. TZA Water Engineers, Inc. performed a water supply evaluation for the Town board in July of 2002. This Water Supply Evaluation Report is attached as Appendix A and it remains a working document and is the basis for referenced water supply needs.

As Keenesburg has continued to grow, additional water is required. In addition to adding LFH wells, an additional Lost Creek Alluvial well will add to supply and it will also provide redundancy in the event that the single well goes down for any reason.

This project is specifically to purchase water rights from the Lost Creek Alluvial aquifer. Following the water rights purchase, Keenesburg will development the infrastructure to deliver the water. The water rights purchase is expected to be approximately $2,100,000 and Keenesburg hopes to close on this asset in late 2022.

The information presented in this study follows the general format discussed with the CWCB staff and as outlined in the CWCB's Guidelines for Financial Assistance.

The relative locations of all facilities described in this report are shown on the Water Line Exhibit as Appendix B.

B. STUDY OBJECTIVE

The following sections provide the necessary background information about the Town's current and future water situation. In addition, information is presented about the financial strength of the Town and its ability to service the debt, which will be associated with the Phase II project.

More specifically, this engineering evaluation will include the following:

- Description of the project sponsor, anticipated revenues and current operations.
- A summary of the existing water supply and the Laramie-Fox Hill water quality issues.

- Future water supply requirements.
- Water system sizing necessary for transmission lines and lift stations.
- Description of alternative water supplies and water transport facilities including piping, pump stations, and storage. These alternatives were developed to determine the least cost alternative for the current expansion and to develop alternatives for future expansions.
- Presentation of a preliminary cost opinion for the needed improvement.
- Financial analysis of the expected revenues that will be obtained from the Town's water enterprise fund in order to service the debt.

C. PROJECT SPONSOR

Keenesburg is the project sponsor. Keenesburg is a Colorado statutory town and manages its water utility through an enterprise fund. Keenesburg relies on water sales, tap fees, and property taxes to fund operations, maintenance and expansion of its system. A copy of the budget is included as Appendix D.

The Town currently serves approximately 854 water taps and an estimated population of approximately 2,500 residents. Water customers within the Town are primarily residential, with approximately 45 other taps, which include commercial, schools, and other public type buildings. The base water rate was recently increased from $43.50 (6,000 gallons) to $59.50 (6,000 gallons) representing a 27% increase. Usages in excess of 6,000 gallons was also increased utilizing a stepped rate to encourage water conservation. Additional information pertaining to the adopted rates is included in the ordinance.

As indicated in the Town's 2022 budget, projected water sales will generate approximately $408,000 per year and tap sales will generate an additional $705,000. Tap sales for 2023 and beyond are expected to increase from previous years due to development of new residential neighborhood with 120 lots approved and under construction, and an additional 700 units that are phases of approval. The Town is also in the process of receiving annexation requests that will generate over 1,000 housing units over the next five to ten years and this will potentially generate $7.1 million in tap fees, and $12 million in raw water acquisition fees. This revenue is expected to continue and most likely increase over the next several years. In the financial section of this report, an assumed growth rate of 4% growth from 2022 to 2032 has been utilized.

Planned payments for this loan will come out of the raw water acquisition fee, which is charged to new residential, commercial and industrial construction.

The Town operates and maintains the water supply wells, water storage tank and the water distribution system. The Town currently utilizes 6 wells, having a total legal capacity of approximately 358 acre-feet per year. These wells are connected directly to two 250,000 gallon water storage tanks located southeast of the Town, where the water is blended an treated prior to distribution. These are the main tank that provides

storage for fire protection and maximum day demand. Keenesburg also investigated, refurbished and installed back into service an existing 200,000 gallon storage tank on the north end of Town and a new booster lift station to increase the system pressure to be the same as the pressure of the existing 250,000 gallon tank. This work was completed in 2008.

The Town's water fund has one outstanding liability, a CWCB loan issued in 2006, which requires an annual payment of approximately $63,265 per year, but Keenesburg has budgeted $73,951 per year and has been paying this amount since 2013, which is why the balance is now $625,000. The outstanding balance on this debt will be paid off at the time of receiving the new loan, providing that the loan is approved.

D. LOAN REQUEST

The Town is requesting a 30-year loan from CWCB in the amount of $2.121 million dollars. The loan is approximately 68% of a $3.10 million project that will result in 120+ acre-feet of additional water rights and the associated infrastructure to transport the water to the Town's distribution system. CWCB Loan Policy No. 8 states that "the cost of water rights acquisition are eligible for a CWCB loan if the purchase satisfies an existing water need or shortage".

Keenesburg needs the additional water rights because of the poor water quality (elevated fluoride and sodium), and the reliance of only one Lost Creek alluvial aquifer well. In essence, implementation of this project will enable the Town to acquire a much-needed water supply to blend with its existing water and to upgrade its water supply system to resolve supply inadequacy issues.

E. EXISTING WATER SUPPLY

Keenesburg currently obtains its water from five wells located in or near Town that draw from the Laramie-Fox Hill Aquifer and one well in the Lost Creek alluvial aquifer. A summary of the LFH well information is included in the TZA Water Supply Evaluation Report in Appendix A, except for Well 14, which is permitted to allow pumping of an average 37.5 acre-feet per year. Details of the Lost Creek Alluvial Aquifer well are included in Appendix A-1 Keenesburg also owns two wells at a site in Roggen, nine miles away that also draw from the LFH Aquifer. The Roggen wells are not being used at this time because there is no connecting pipeline from the wells to Keenesburg and this connection is not believed to be financially viable in the foreseeable future, therefore, the wells are not included for evaluation at this time.

F. WATER QUALITY ISSUES

There are two major water quality issues associated with the Town's water system. The first is the quality of the LFH water itself. The LFH water is less than desirable for

usage in municipal or irrigation applications. Analysis shows that it exceeds drinking water standards for fluoride. The maximum contaminant level (MCL) for fluoride is 2 mg/I and reported levels of fluoride in the Keenesburg water wells are at 3.1 mg/I. The Colorado Department of Public Health & Environment (CDPHE) has not issued any enforcement orders at this time other than requiring public notice.

The Laramie Fox-Hill water also has a high Sodium Absorption Ratio (SAR). This ratio is used to determine the suitability of the water for use in the irrigation of crops and landscaping. A ratio of less than 10 is suitable for irrigation. The Laramie-Fox Hill water in Keenesburg has been recorded at a level of 26.9. As a result, special soil management is necessary for successfully irrigating crops and landscaping.

Blending the water from the Laramie Fox Hill Aquifer with that of the Lost Creek Aquifer has been beneficial since the first Lost Creek alluvial well was put into service in 2007. Providing roughly a 50-50 blend of the two different aquifer waters shows drops the SAR ratio below 10 and the fluoride drops to approximately 1.5 mg/I, which is below the MCL of 2 mg/I.

G. FUTURE WATER REQUIREMENTS

Historical annual average water consumption is used to develop a projection that estimates the future water needs for the Town. In 2004, the Town utilized 167 acre-feet and in 2021, 232.7 acre-feet. In 2021, the LFH water used totaled 103.5 acre-feet of the total 221-acre feet available from Wells No. 2, 4, 5, 7, 8, and 12. In the Water Supply Evaluation Report, it was projected that 483.4 acre feet of water would be needed in 2030, which we have tracked and we believe is still accurate for budgeting purposes. This means that the Town needs to develop infrastructure to deliver an additional 257 acre-feet of water to its customers by 2040.

If the Town is to maintain a 55-45 blend, a total of approximately 272,2 acre-feet of Lost Creek Alluvial water and 217.9 acre-feet of LFH water will be required by 2040, given the total projected demand of 490.1acre-feet. The Town will continue to obtain an additional LFH water as new land is annexed into Town due to the requirement that the developers dedicate their water shares to the Town as part of the development process, but the town will be short of Lost Creek Alluvial water before 2025.

A summary of the required water assuming a 55-45 blend is shown in the table below:

Year	Water Required	Laramie Fox Hill Water		Lost Creek Alluvial Water		Required Lost Creek Alluvial Water
		Projected	Available	Projected	Available	
	Ac-Ft	Ac-Ft	Ac-Ft	Ac-Ft	Ac-Ft	Ac-Ft
2021	233	103.5	258.5	129.5	139.6	0
2025	268.4	121.0	258.5	151.2	(1)	11.6
2030	326.6	147.2	258.5	183.9	(1)	44.3
2035	397.3	179.1	258.5	223,7	(1)	84.1
2040	483.4	217.9	258.5	272.2	(1)	132.6

Note: (1) Additional Lost Creek Water purchase will be required prior to 2025.

This table shows that the town needs additional Lost Creek alluvial water prior to 2025. The current Laramie Fox Hill Water availability will increase as each parcel of land is annexed into the town. The current projected annexations that will occur over the next few years is 500 acres, which will yield approximately an additional 100 acre-feet of Laramie Fox Hill water.

H. SYSTEM SIZING

The volume of water produced by the existing wells and any new water from the Lost Creek Aquifer must meet the projected maximum day demand. Maximum day flow occurs during the hot weather season when irrigation demand is the highest. The available legal supply from the existing wells is 1,015,200 gallons per day or 705 gallons per minute (GPM). In 2005, the maximum day flow was reported to be 356,300 gallons (248 GPM) or 80 percent of the available well capacity. In 2022, the maximum day flow was reported to be 637,900 gallons (443 gpm) or 63 percent of the currently legal available well capacity. It is important to note that legal capacity is much greater than physical capacity of the wells, and the Laramie-Fox Hills aquifer is a non-renewable resource.

I. DESCRIPTION OF ALTERNATIVE WATER RIGHTS

Three alternatives were researched in the development of the Town's water system improvement plan. The first was “Do Nothing”. This was the least expensive, but due to current growth patterns, Keenesburg would not be able to rely on the existing infrastructure to meet future demands.

The second alternative is to construct additional LFH wells as the Town continues to grow. This was not chosen because it would result in additional percentages of

nonrenewable LFH water that would effectively degrade water quality in the potable system, and it would also a require 1 new well for every eighty (80) to one hundred (100) GPM peak demand. The costs associated with only adding additional LFH wells combined with the poor water quality ranked this option low, but it still remains an option if purchase of additional alluvial water (Blue Valley Farms or others) from the Lost Creek alluvial aquifer is not successful.

The third and best option was determined to be purchase of additional water rights from the Lost Creek alluvial aquifer, specifically, from Blue Valley Farms Well Permit No. 31558-FP. The subject well has already been approved for export out of the Lost Creek Designated Basin and changed uses include industrial and agricultural. Keenesburg has received water quality analysis and we believe this water is good quality for blending. Blue Valley Farms and Keenesburg are currently co-applicants to modify the use to include municipal use for the Town of Keenesburg. The sale will not close until the change of use is approved and the loan is closed withthe CWCB. Keenesburg has the funds available for infrastructure improvements and will begin work to incorporate this additional source into the municipal water system once a CWCB loan is obtained. This option will also provide redundancy as it will be a backup source of supply of Lost Creek alluvial water in the event the one and only alluvial well the Town has goes down for any reason. In the event that a successful contract is not able to be made between Keenesburg and Blue Valley Farms, additional water rights will first be evaluated in the Lost Creek alluvium and Alternative 2 (additional LFH wells) will also be considered. The Water Line Map, included in Appendix B, shows a potential route to get water from Well Permit No. 31558-FP to existing infrastructure, but this route has not yet been finalized. This request for funding is only to obtain water rights from the subject well.

Alternative 3

The proposed facilities for this alternative include approximately 1.3 miles of water transmission line, new well pump equipment, well building, electrical and mechanical controls. The water blending station exists near Keenesburg Well No. 7, at the Town's existing water tank site.

Current projections show that the Town only needs the volume supplied by an eight-inch line. The capacity of an eight inch line equates to approximately 450 GPM continuously. The facilities in this alternative would be designed, constructed and owned by the Town who would also operate them.

J. COST COMPARISON OF ALTERNATIVES

Capital Costs

The costs that were evaluated for each option are as follows:

Option 1 – Do nothing – Cost = ZERO

Option 2 – New LFH wells only

Based on recently constructed Well 14 (2020) and on budget estimates we have obtained for construction in 2022, the estimated cost to drill, develop, test, construct, and equip one LFH well is $700,000. On a conservative estimate, this cost would provide up to 50 GPM continuously, 80 acre-feet per year of non-renewable groundwater. These costs do not include piping of wells to the blend station or electrical upgrades that may be required.

In summary, Alternative 3 is the least expensive option and is the preferred alternative. The Town and Blue Valley Farms are very close to finalizing negotiation for purchase of a second well in the Lost Creek Alluvium that will yield the Town an additional 120+ acre-feet annually, and provide a backup source for this renewable resource.

Operational Costs

Operational costs for the Town should not increase under Alternative 3. The reason is that the Town will be operating only half of the well capacity in the Lost Creek Alluvium that it presently operates and the power and operation labor cost for pumping should be nearly equal the present cost.

K. SELECTED CAPITAL IMPROVEMENT PROGRAM

The Town does not have the financial resources at the present time to fund the complete $3.1 million Alternative 3 project present herein. The project presented in this section is scaled back to provide for finances to purchase water rights and the remainder can be afforded by the Town.

The capital program would be as shown below:

Item	Unit	Quantity	Unit Cost	Total Cost
1.3 Mile Pipeline	LF	6,850	65.50	$448,675
Well, Pumps, Vaults & Structures	Ea	1	315,000.00	$315,000
Subtotal				**$763,675**
Contenginces 15%				114,550
Subtotal				878,225
Engr, Legal & Admin				131,733
Total Alternative 3				**$1,009,958**

The next section of this report will identify the various funding sources that will be required to purchase the new well and construct a new well and 1.3 mile pipeline to transport the water to the Town's existing water tank.

L. FUNDING OF THE WELL AND WATER SYSTEM IMPROVEMENTS

A financial plan has been developed that demonstrates how this project will be funded. A summary of the costs and funding sources are as shown in the table below.

Funding with CWCB Loan

Project Component	Project Cost	Loan	Town
Purchase Water	$2,100,000.00	$2,100,0000	$0.00
Phase 2, Pipeline & well	$1,009,958.00		$1,009,958.00
Loan Cost	$21,000.00	$21,000	
TOTALS	**$3,109,958.00**	**$2,121,000**	**$1,009,958.00**

The Town desires to borrow $2.121,000 from the CWCB. The Town will provide $1,009,958.00 of its own reserves to complete this project. At the beginning of 2022, Keenesburg had $6,697,777. In addition, the Town projects additional revenue over the next three years through the sale of 36 taps, 12 taps per year and this will result in an additional $689,040.

Meeting the annual debt payment will be made from raw water acquisition fees and tap fees (development entering the Town). While not anticipated, the Town Board has the authority to implement a water rate increase to meet its debt obligation without the vote of the public. This authority is the result of the Towns water utility being an enterprise utility fund.

A 30-year loan for the requested $2,121,000 at a 2.70 percent interest rate results in an annual payment of $103,609.00.

A summary of how the dept obligation would be paid in the first year is shown in the table below.

Revenue Projection

Item	Cost	Percent of Total
Projected Revenue From Water Sales	$229,680	N/A
Total Dept Service Required	$103,609	100

The Town is in a good position to fund this project.

The summary above shows that the Town will require the sale of six taps to cover the dept service. With the 239 residential units being platted and available for purchase of

building permits in 2023, the Town will most likely be capable of making the annual dept payment and will not need to raise the rates. However, should the Town not sell adequste taps, there is sufficient monies in the water tap and raw water acquisition reserves to make the payments.

Appendix F Shows the 10-Year Financial Projection used for this analysis and for this loan. The indicated population, water use and number of taps are based on a 4% growth and projected growth.

The "Capital Costs" section of this spreadsheet shows the costs being spent over a two-year period. The same costs as were identified in the proposed capital improvement table above can be found in this section of the spreadsheet. The cost of the water purchase is shown at $2,121,000.

The next line item is the actual cost of purchasing the well and constructing the replacement well and the pipeline to bring the water to the Town's water tank. Again this is spread over two years to allow design to start in 2023 with construction starting in late 2023 or early 2024.

The next section of the spreadsheet is the "Cash Flow Calculations". This section is important to demonstrate how the loan proceeds will be funded and to monitor the water fund balance to assure that reserves are maintained to cover any emergencies that may occur, such a the need to replace an existing well.

The cash flow calculation, shown at the bottom of this spreadsheet, starts with annual 2022 water fund revenue of $705,000. This figure is obtained from the 2022 budget and is modified slightly.

The most important item indicated in this spreadsheet is the fact that the water fund balance never falls below $3,816,877 dollars. It can also be seen that with the tap sales, this balance grows to nearly $4,500,000 dollars one year following construction of the new well and pipeline.

APPENDIX A

Water Supply Evaluation

TZA Water Engineering, Inc.

Appendix B
Water Line Exhibit

Appendix C
Cost Opinion, Summary of Water Supply Alternatives

Appendix D
2022 Waterworks Budget

Appendix E
Water Fee Resolution - - 2021-64

Appendix F
10 Year Financial Detail