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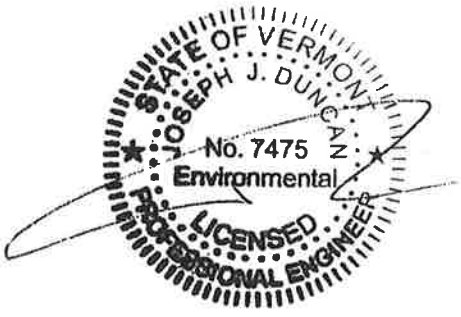
EAST MONTPELIER FIRE DISTRICT #1, VERMONT

Municipal Water System Valuation Study

Evaluation Report

July 2013



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SECTION 1

EXECUTIVE SUMMARY

SECTION 1 EXECUTIVE SUMMARY

Water service within the East Montpelier Fire District #1 is currently provided by the privately owned and operated Crystal Springs Water Company Inc. (WSID #5264). The water system is supplied by three (3) springs with a combined yield of 50 gallons per minute. The East Montpelier Fire District #1 is exploring the possibility of purchasing the existing water system. The Fire District is looking to evaluate the adequacy of the existing water system and identify needed improvements and associated constructions costs to address any of the existing system deficiencies to adhere to the requirements of the Drinking Water and Groundwater Protection Division (DWGPD).

The Crystal Springs Water Company is currently operating under a Temporary Permit to Operate from the State of Vermont DWGPD, and a copy is provided in Appendix B. In the 2010 and 2013 Sanitary Surveys prepared by the Division, several deficiencies were noted that need to be addressed prior to receiving a Permit to Operate. A copy of the 2010 and 2013 Sanitary Surveys can be found in Appendix C. The Fire District is interested in evaluating the immediate and future improvements that the system would require to determine whether acquiring the system is advantageous.

The Crystal Springs water system is currently serviced by three (3) springs with a combined yield of 50 gpm. There are four (4) springs within the distribution system but one (1) is not in service. Spring #1 has a permitted yield of 10 gpm and is contained within a concrete structure that doubles as storage. Spring #2 has a permitted yield of 30 gpm and Spring #4 has a permitted yield of 10 gpm. Spring #3 is not in service. The Crystal Springs water system has a total of 58,000 gallons of storage, which pressurizes the system via gravity. Pressures in the system range from 17 psi at the northern end of Cherry Tree Hill Road to 122 psi on Route 2 near the intersection of Route 14. The system contains approximately 24,900 linear feet of water main, with approximately 67% being 6" or 8" PVC. A map of the water system can be found on Figure 2 in Appendix A.

Outlined below are the outstanding improvements needed to acquire a Permit to Operate:

1. Inadequate Storage Facility Alarms
2. Inadequate Fire Hydrant Construction
3. Inadequate Source Cover/Storage Tank Access Construction
4. Inoperable Meter
5. Storage Overflow
6. Monthly Reporting
7. Cross-Connection Hazard – Unapproved In-Home Booster Pumps
8. Underwater Supply Line Crossing
9. Overflow Screen Construction
10. Storage Tank Inspection
11. Disinfection Capabilities
12. Source Protection Plan Update
13. Annual Testing of Backflow Prevention Device at Farm

It is assumed that Items #7 thru 13 would be addressed by the Crystal Springs Water Company prior to any purchase or acquisition by the Fire District. Items #5 and 6 can be resolved with

minimal financial investment.

In order for a Permit to Operate to be issued for the water system, the first four (4) outstanding improvements would need to be completed. Item #1 entails installing at a minimum a low level water alarm in the storage reservoir. The fire hydrant construction improvement (Item #2) could be addressed by either removing the fire hydrants completely or by welding the pumper connections. Another option would be to replace all fire hydrants with flushing hydrants. For budgetary purposes, the latter alternative was used. The "Inadequate Source Cover /Storage Tank Access Construction" (Item #3) would include a new concrete roof and access. For Item #4 a new 8" master flow meter would need to be installed downstream of the storage reservoir in the transmission main. The total project cost for construction of these immediate improvements is approximately $48,650. With a Drinking Water State Revolving Fund Loan with a 3% interest rate, and 20 year term, an annual loan payment would be approximately $3,270.

It is anticipated that the annual Operation & Maintenance (O&M) cost will increase significantly compared to the existing Crystal Springs Water Company, Inc. costs, as Dean Hedges operates and manages the system independently. The Crystal Spring operating budget for the 2011, based on the annual report was approximately $50,000. The estimated annual operation cost for the East Montpelier Fire District #1 will be approximately $85,500, based on similar sized municipal water system, which includes salaries, insurance, chemical, supplies, capital reserves, etc.

The Crystal Springs Water Company currently brings in around $65,000 of revenue per year from billings. It is assumed that this will remain consistent unless user rates are increased.

Accounting for the annual cost of the O&M and the annual loan repayment for the immediate improvements required to receive a Permit to Operate, the East Montpelier Fire District #1 will not have any money remaining to allocate to the acquisition of the Crystal Springs Water Company, Inc. The only way that the Fire District could acquire the water system would be to raise rates. Even by raising rates substantially, the Fire District would not have significant reserves to offer the Crystal Springs Water Company, Inc. for acquisition.

The East Montpelier Fire District #1 can utilize the State of Vermont Drinking Water State Revolving Fund for construction of the immediate improvements and the acquisition of the Crystal Springs Water Company, Inc. The terms of the loan would be no greater than 3% for a 20 year term.

The next steps for the project are presented below:

- Approve this report.
- Begin discussions and possibly negotiations with the Crystal Springs Water Company, Inc. regarding acquisition of the water system.

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SECTION 2

INTRODUCTION

SECTION 2 INTRODUCTION

2.1 PURPOSE

The East Montpelier Fire District #1 does not currently own or operate a water system, however, the Fire District is exploring the possibility of purchasing the existing private Crystal Springs water system (WSID #5264). The purpose of this study is to evaluate the adequacy of the existing water system, identify needed improvements and associated cost needed to address any of the existing system deficiencies to meet the requirements of the Drinking Water and Groundwater Protection Division.

2.2 BACKGROUND

The East Montpelier Fire District #1 is a municipality located within the Village of East Montpelier, in Washington County (Figure 1, Appendix A). The municipality does not currently own or operate a water system. The Village of East Montpelier is currently serviced by the private Crystal Springs water system.

The Crystal Springs Water Company, Inc. is a private water system (WSID #5264) servicing a year-round population of approximately 300 people through 115 connections since 1966. The system is supplied by three springs that flow into a reservoir and distributes water to the system. The extent of the water system is shown in Figure 2 of Appendix A.

2.3 SCOPE OF SERVICES

The scope of this water system evaluation study is to evaluate the adequacy of the existing water system and identify needed improvements and associated construction cost estimates to address any existing water system deficiencies to meet the requirements of the Drinking Water and Groundwater Protection Division, formerly known as the Water Supply Division. Preparation of the report includes the following tasks:

- Gather and review existing data and records
- Develop a design criteria
- Review the existing Crystal Springs water system
- Develop water system needed improvements
- Prepare an evaluation report

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SECTION 3

DESCRIPTION OF EXISTING WATER SYSTEM

SECTION 3 DESCRIPTION OF EXISTING WATER SYSTEM

3.1 HISTORY

The Crystal Springs Water Company, Inc. is a private water company that supplies water to residents of East Montpelier. The system is regulated by the Vermont Drinking Water and Groundwater Protection Division under WSID #5264. The water system began serving customers in 1966 and currently serves a year-round population of approximately 300 people through 115 service connections. The system is a mix of residential, commercial and agricultural users.

The Crystal Springs water system is currently operating under a Temporary Permit to Operate (TPO) dated March 26, 2010 and expires on February 1, 2014. A Sanitary Survey was conducted by the Drinking Water and Groundwater Protection Division (DWGPD), formerly known as the Water Supply Division, on May 31, 2013. The DWGPD issued a letter on June 18, 2013 identifying the following:

Major Deficiencies

- Inadequate Monthly Reporting
- Inadequate Chlorine Residual Recording on Bacteriological Sampling
- Inadequate Source Cover Construction
- Cross-Connection Hazard – Unapproved In-Home Booster Pumps
- Inadequate Fire Hydrant Construction
- Storage Tank Alarms/Level Controls

Minor Deficiencies

- Disinfection Capabilities
- Underwater Supply Line Crossing
- Overflow Screen Construction
- Storage Tank Inspection Overdue
- Storage Tank Access Construction
- Master Meter Repair/Replacement
- Source Protection Plan Update Overdue
- Required Disinfection By-Product (DBP) Monitoring and Monitoring Plan
- Annual Testing of Backflow Prevention Device at Farm Overdue

Considerations and Comments

- Weld cap on abandon well near Spring #2.
- Remove or cap bulk water hauling hydrant.
- O&M Manual update

To receive a Permit to Operate from the DWGPD, the Crystal Springs water system would need to address these deficiencies. Refer to Appendix B for the Temporary Permit to Operate and Appendix C for the 2010 and 2013 Sanitary Surveys.

3.2 WATER SOURCE

The Crystal Springs water system is currently supplied by three (3) springs with a combined yield of 50 gallons per minute. There are four (4) springs within the distribution system but one (1) is not in service. Spring #1 has a permitted yield of 10 gpm and is contained within a concrete structure that doubles as storage. Spring #2 has a permitted yield of 30 gpm and is piped into the storage reservoir. Spring #3 is not in service. Spring #4 has a permitted yield of 10 gpm, with a concrete tank that connects to the storage reservoir. Refurbishment of the springs and reservoir was completed in 1985.

The Crystal Springs water company has deeded water rights on the Pratt property that include 30 rods (495') around each spring and the rights to all water above and below the surface of the ground within these limits.

An existing drilled well (Well #1) off Route 14 is used by the Crystal Springs water system as an emergency source of water for the system. The DWGPD has allowed this well to be used only for emergency use. The well, drilled in 1961, has an estimated yield of over 50 gpm and is known to have elevated iron/or manganese.

In 1992, two test wells were drilled at the existing springs location. An evaluation was performed which indicated that Well #2 and #3 produced 150 gpm at 400' deep and 350 gpm at 72', respectively. The wells are not in use and have not been submitted for source approval by the DWGPD. These wells have since been abandoned (sealed) as required by DWGPD.

A review of the existing water sources has been prepared by Hoffer Consulting Inc. and is included in Appendix E.

3.3 WATER STORAGE

The Crystal Springs water system has a total of 58,000 gallons of storage. 40,000 gallons of which are contained within the concrete storage tank and an additional 18,000 gallons from the unlined well house over Spring #1.

3.4 DISTRIBUTION SYSTEM

The water distribution system begins at the springs located to the North of Minister Road and pressurizes the system via gravity. The transmission main runs cross country down to Cherry Tree Hill Road, where it services residents between Minister Road and Quake Road. The transmission main continues cross country from Cherry Tree Hill Road to Route 2. The distribution system services the majority of residents along Route 2 in East Montpelier and Route 14 South. A water system map is provided on Figure 2 in Appendix A.

The system includes piping, valves, hydrants and appurtenances. The hydrants are not in service and cannot be used for fire flow situations. The hydrants are enclosed with a box structure to deter neighboring fire departments from using them if called upon in an emergency. The majority of the distribution system is 4, 6 and 8 inch diameter water mains. Six (6) and eight (8) inch diameter PVC pipe within the system represent approximately 16,700 linear feet of the total 24,900 linear feet

of water main in the system, or approximately 67%.

In 2011, the Winooski River crossing servicing Route 14 was replaced with a new 8 inch diameter HDPE main.

3.5 WATER USAGE

The water system serves a year-round residential population of approximately 300 people through 115 service connections. The average daily demand of the system is 39,000 gallons per day (gpd), per source meter readings in 2010. The maximum day demand peaking factor is 1.9 times according to the information provided in the 2010 Temporary Permit to Operate, resulting in a maximum day demand of 74,100.

The Crystal Springs water system is currently not permitted to add new service connections or expand the existing water demand requirements without first demonstrating adequate reserve capacity.

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SECTION 4

EVALUATION OF EXISTING WATER SYSTEM

SECTION 4 EVALUATION OF EXISTING WATER SYSTEM

4.1 WATER SOURCES

The Crystal Springs Water Company currently has three (3) springs, permitted by the Drinking Water and Groundwater Protection Division (DWGPD), with a combined yield of 50 gallons per minute (gpm), or 72,000 gallons per day (gpd). The average demand of the system is approximately 39,000 gpd and a maximum day demand of approximately 74,100 gpd. Subsequently, the combined yield of the springs is greater than the average day demand but not the maximum day demand.

During droughts, history has shown that the springs are only capable of producing a combined yield of 25 gpm, or 36,000 gpd. There is cause for concern during droughts that the spring's yields cannot meet the average day demand. Furthermore, maximum day demands are experienced during the warmest and driest times of the year. The Crystal Springs water system does have an emergency back-up well located off from Route 14 that is approved to be used by the DWGPD under emergency scenarios. The emergency well has an estimated yield of over 50 gpm and was last used during the drought of 2000, and when breaks have accord in the distribution system.

The Temporary Permit to Operate states that "the water system is not Permitted to add new service connections or expand existing water demand requirements without first demonstrating reserve capacity as prescribed under Appendix A, Part 2 of the WSR." If the system was to expand further evaluation would need to be done on the consistent yield of the springs or into permitting a well in the vicinity of the springs.

The emergency well (Well #1) is not a viable source for permanent usage as it has outstanding water quality issues with high iron and magnesium. The emergency well is located off from Route 14 and does not have an adequate source protection area of 200' radius around the well, which would be needed for source approval.

In 1992, two (2) test wells were drilled and tested at the site of the existing springs. Tests determined that Well #2 produced approximately 150 gpm at 400' deep and Well #3 produced 350 gpm at 72' deep. Ultimately, an application for source approval was never submitted to the then Water Supply Division post-testing. Both wells have since been abandoned. The high yield at Well #3 provides for adequate flow for both the existing connected users and potential expansion of the distribution system both through new users and fire flow protection.

Presented in Appendix E is a review of the existing and potential future water sources for the Crystal Spring Water System in East Montpelier, Vermont prepared by Jeff Hoffer of Hoffer Consulting Inc. The review evaluates the existing permitted springs, existing Well #1 and two (2) wells that were drilled in the vicinity of the existing springs. For more detail refer to the "Source Review" in Appendix E.

4.2 WATER STORAGE

The Crystal Springs water system has a total storage volume of approximately 58,000 gallons, 40,000 of which is from Reservoir #2 and 18,000 from Reservoir #1. Reservoir #1 is a spring box

with no concrete floor that is piped to Reservoir #2. The current storage capacity can meet the average, but not the maximum day demand. The current system does not have fire flow storage, but does have fire hydrants connected to the system, although they are enclosed with wooden structures to deter use.

The 2013 Sanitary Survey states the "Inadequate Fire Hydrant Construction" as a major deficiency that needs to be addressed. This can be accomplished by either additional storage via construction or removing the existing fire hydrants.

The "Storage Tank Alarms/Level Controls" is another major deficiency. As stated, "level control is recommended but low water level is required for public community water system". The DWGPD has the authority to require level alarm controls in storage tank, but controls are not required by rule. The chlorinated overflow is also discussed under this deficiency, and was discussed in more detail as a consideration or comment in the 2010 Sanitary Survey. The DWGPD requires that this overflow water be de-chlorinated prior to over land flow. Observations are that no stream is located directly next to the reservoir with the overflow. In this case, there is evidence that there is ample overland travel to the nearest stream to dissipate the chlorine residual in the overflow water prior to reaching the stream.

"Inadequate Source Cover Construction" is identified as a major deficiency in the 2013 Sanitary Survey. The existing covers on Spring #2 and #4 are pressure-treated and not sanitary in nature. The DWGPD is requiring that these covers be re-constructed using approved materials. Existing construction material is also mentioned as a minor deficiency for the "Storage Tank Access Construction." The screens on the overflow pipe for spring #4 collection box and water storage tank must also be replaced per Item #9 "Overflow Screen Construction" (minor deficiency).

Currently, only Spring #4 is chlorinated. There are concerns with Springs #1 and #2 not being directly chlorinated and the amount of disinfection contact time available prior to the first service connection, per Item #7 "Disinfection Capabilities" of the 2013 Sanitary Survey (minor deficiency).

The DWGPD requires that storage tanks be inspected every five (5) years after being placed into services. Under Item #10 "Storage Tank Inspection Overdue" (minor deficiency), a comprehensive storage tank inspection must be conducted.

The following recommendations were made by the DWGPD for consideration by the Crystal Springs Water System:

- Weld a cap on abandoned well.
- Remove or cap bulk water hauling hydrant.

If fire flow was to be provided in the future, additional storage would be required. At a minimum, the water system would need to have 500 gpm for a 2 hour duration, or an equivalent 60,000 gallons of fire flow storage. This would be in addition to the storage needed to meet the average and maximum day demands.

4.3 DISTRIBUTION SYSTEM

The majority of the water distribution system consists of 6" and 8" diameter PVC mains. The majority of smaller diameter and aged mains in the system are located along Route 2 and Route 14, where the users are concentrated. The current water system is adequate for the average daily demand but does not provide fire flow due to inadequate storage volume. The water system has fire hydrants connected to the distribution system, but are enclosed with wooden structures to deter other fire departments from using these hydrants in the event of an emergency. The East Montpelier Fire Department does not use these fire hydrants. There are currently five (5) fire hydrants connected to the system.

The distribution system is in relatively good shape in comparison to other systems of its age in Vermont. Like any system there are portions of lines that could be upgraded that would benefit the water system. The following lines are either undersized or should be replaced in the future to improve the integrity of the water system:

- 4" AC on Route 2 - 2,800 L.F.
- 2" PVC on Quaker Road, Kelton Road and Route 14 - 3,800 L.F.
- 4" AC on Route 14 - 2,200 L.F.
- 6" AC cross country along Route 14 - 3,000L.F.

The Crystal Springs Water Company recently worked with the Vermont Agency of Transportation to replace the existing Winooski River Crossing at the intersection of Route 2 and Route 14. The existing main needed to be relocated as it conflicted with a proposed temporary bridge. A new 8" diameter HDPE main was installed via direction bore under the Winooski River in October 2012. Work also included the installation of three (3) new sleeves under Route 14 to protect house service lines under the highway that is planned for construction.

The supply line from Spring #4 to the storage reservoir has been exposed under a stream bed due to flooding. Per Item #8, "Underwater Supply Line Crossing" under the 2013 Sanitary Survey, "a minimum cover of two (2) feet shall be provided for all under water crossings".

The pressures in the system range from 17 psi at the northern end of Cherry Tree Hill Road to 122 psi on Route 2 near the intersection of Route 14. The low pressures at the northern end of Cherry Tree Hill Road are of concern. The Water Supply Rules state that "the normal working pressure in the distribution system shall be approximately 60 to 80 psi in the distribution system and not less than 35 psi." The system must be able to also maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow.

There are two (2) existing in-home storage tanks and booster pumps servicing individuals, which do not have documentation showing approval of their construction by the DWGPD. Refer to Item #4 "Cross-Connection Hazard" under the 2013 Sanitary Survey.

One (1) comment made in the 2010 Sanitary Survey and in the 2013 Sanitary Survey as a minor deficiency, pertains to the inoperable meter located at the end of the source transmission main. The purpose of the meter is to provide accurate supply and demand information to the water

system. Water meter data is currently available for the water overflowing the Spring Box and metered overflow of the reservoir.

4.4 WATER USAGE

Based on source meter readings, the Crystal Springs water system has an average day demand of 39,000 gpd. The maximum day demand for the system is approximately 74,100 gpd if an assumed 1.9 peaking factor is used.

Based on the average day demand usage, it is estimated that each service connection consumes approximately 339 gpd. The connection usage is high compared to other Vermont water systems on a per connection basis. The system is non-metered, thus a comparison between metered water from the springs and user metered usage could not be analyzed to determine the unaccounted for water. From the data available, the system appears to have some unaccounted for water, which can be from leaks, commonly found in older age pipes, or unknown connections.

4.5 ADMINISTRATIVE

According to the 2013 Sanitary Survey and discussions with the DWGPD, "the Water System must submit accurate monthly reports including the daily chlorine residual taken at the entry point to the distribution system." In past instances, the Crystal Springs Water Company has failed to complete the monthly water reporting forms with conforming disinfection testing and information.

Further administrative and record keeping issues arose in the 2013 Sanitary Survey, and are as follows:

- Inadequate Monthly Reporting (Major Deficiency)
- Inadequate Chlorine Residual Recording on Bacteriological Sampling (Major Deficiency)
- Source Protection Plan Update Overdue (Minor Deficiency)
- Required Disinfection By-Product (DBP) Monitoring and Monitoring Plan (Minor Deficiency)
- Annual Testing of Backflow Prevention Device at Farm Overdue (Minor Deficiency)
- Operation & Maintenance (O&M) Manual Update (Recommendation)

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SECTION 5

RECOMMENDED PLAN

SECTION 5 RECOMMENDED PLAN

5.1 RECOMMENDED IMPROVEMENTS

Based upon input and discussions with the Drinking Water and Groundwater Protection Division (DWGPD), the Sanitary Surveys and Chenette Associates, P.C. reports, a list of deficiencies were prioritized. Recommendations are categorized as follows:

- Immediate Improvements – Improvements that are to be constructed in the next two (2) years to address the most significant deficiencies to obtain a PTO from the DWGPD.
- Short Term Improvements – Improvements that are to be constructed on an annual basis using money allocated in the annual water budget or local funding; timing of the construction of these improvements will be based upon availability of money and/or local funds.
- Long Term Improvements – Improvements that should be monitored to determine if they are necessary depending on future conditions.

Immediate Improvements (0-2 Years)

1. Inadequate Storage Facility Alarms
    - Install a new solar powered, battery operated, cellular radio alarm system.
2. Inadequate Fire Hydrant Construction
    - Install blind flanges on pumper connections
    - Weld fire hydrants shut
    - Replace fire hydrants with flushing hydrants
3. Inadequate Source Cover Construction/Storage Tank Access Construction
    - Construction of new concrete cover and new access
4. Inoperable Meter
    - Install a new 8" flow meter in the transmission main.
5. Storage Overflow
6. Monthly Reporting

Short-Term Improvements (2-10 Years)

1. New Water Source
2. New Water Storage Tank
3. Distribution System Improvements
    a. Route 2 Waterline Replacement

Long-Term Improvements (10-20 Years)

1. Distribution System Improvements
    a. Route 14 Waterline Replacement
    b. Quaker Road, Kelton Road, & Route 14 Waterline Replacement
    c. Cross Country-Route 14 Waterline Replacement

All recommended waterline replacement mentioned in the Short and Long Term Improvements shall be replaced with new 8" diameter mains.

Items #5 and 6 are expected to be addressed with written responses or clarifications with minimal financial costs.

It is expected that the Crystal Springs Water Company, Inc. will address the following deficiencies prior to any transfer of the water system to the East Montpelier Fire District #1:

- Cross-Connection Hazard – Unapproved In-Home Booster Pumps
- Underwater Supply Line Crossing
- Overflow Screen Construction
- Storage Tank Inspection
- Disinfection Capabilities
- Source Protection Plan Update
- Annual Testing of Backflow Prevention Device at Farm

5.2 OPINION OF PROBABLE COST

Presented below in Table 5.1 is the estimated construction cost for the immediate improvements mentioned previously. Not all of the improvements were given monetary values, as some can be addressed through written documentation or through other non-monetary options. The estimates are based upon construction occurring in June 2013 (ENR 9500). Only the immediate improvements are included because they are the only components that will be included in the negotiating prices. In order to receive a Permit-To-Operate from the Vermont DWGPD, these improvements listed will need to be addressed.

Table 5.1
Immediate Improvements
Construction Cost Comparison

Items	Construction Cost (ENR 9500)[1]	Total Project Cost (ENR 9500)[2]
Storage Alarms	$3,750	$5,250
Hydrant Replacement[3]	$9,500	$13,300
Source Cover/Access	$15,000	$21,000
Flow Meter	$6,500	$9,100
Total		**$48,650**
Annual Loan Repayment		**$3,270**

Notes:
1. ENR 9500 = June 2013
2. Total Project Cost is estimated to be 1.4 times construction cost.
3. Replacing all fire hydrants in the system with flushing hydrants.
4. Annual loan repayment 3% for 20 years ($67.22/$1,000).

5.3 OPERATION & MAINTENANCE COST

The Crystal Springs operating budget, provided in Appendix D, was used as a reference to approximate an annual operating cost for East Montpelier FD#1. The Crystal Springs operating budget for 2011 Annual Report was approximately $50,000. Some items not applicable to

municipal ownership were eliminated from the Crystal Springs operating budget, i.e. depreciation and taxes. Based on the size and type of the Crystal Springs water system, and number of connected users the annual Operation and Maintenance (O&M) costs would be approximately $85,500 per year. Refer to Table 5.2 for a breakdown of O&M costs.

Table 5.2
Annual Operation and Maintenance Costs

Items	Price
Salaries	$30,000
Purchased Water	$500
Power for Pumping	$500
Supplies Expenses	$3,000
Transportation	$3,000
Chlorine/Chemicals/Testing	$2,000
Repairs	$5,000
Capital Reserves	$10,000
Administrative/Salaries	$3,000
Office Supplies/Expenses	$1,500
Outside Services	$5,000
Insurance Expenses	$10,000
Employee Pension & Benefits	$5,000
Miscellaneous General Expenses	$7,000
Total	**$85,500**

5.4 USER RATES

The Crystal Springs user rates have remained the same for the past 16 years. The system is not metered; thus users pay a flat unmetered rate. Presented below in Table 5.3 is a summary of the user costs for each category and the annual revenue.

Table 5.3
Crystal Springs User Rates

User Category	# of Customers	Monthly Rate	Cost Per User Per Year	Annual Revenue
Residential	93	$41.09	$493.08	$45,856.44
Commercial	18	$66.78	$801.36	$14,424.48
Other (Farm)	---	---	$4,776	$4,776.00
			Total Revenue	**$65,056.92**

Notes:
1. Rates are based on Crystal Springs Water Company, Inc. 2011 Annual Report.

5.5 ACQUISITION PRICE

Given the current revenue from the current rates, it is not feasible for the East Montpelier Fire District #1 to maintain the current rates and purchase the water system as there is a deficit in

anticipated revenues versus expenses (refer to Table 5.4). Without a rate increase, the O&M expenses for the East Montpelier Fire District #1 to run and operate the water system, coupled with the yearly loan repayments to obtain a Permit-to-Operate exceed the annual revenue.

Table 5.4
Current Maximum Acquisition

Items	Price
Revenue	$65,057
O&M Expenses	($85,500)
Yearly Loan Repayment for Immediate Improvements	($3,270)
Max Yearly Payment for Acquisition	**($23,713)**
Max. Acquisition Fee[1]	**$0**

Notes:
1. Based on DWSRF Loan, 3% for 20 years ($67.22/$1,000)

5.6 RECOMMENDATION

In order for the East Montpelier Fire District #1 to acquire and obtain the Crystal Springs Water Company, Inc. water system, the user rates for the following User Categories would need to approach the following:

Table 5.5
User Rate Increase

User Category	Existing Annual Cost	Min. Required Annual Cost	Min. Cost Increase
Residential	$493	$670	$177
Commercial	$801	$1,080	$279
Other (Farm)	$4,776	$6,500	$1,724

The user rate increases provided in Table 5.4 are based on a uniform increase per equivalent units for each customer category. These user rate increases would be enough to offset the expenses. It excludes a purchase price for the Crystal Springs Water Company, Inc. It is recommended that the East Montpelier Fire District #1 begin negotiations with the Crystal Springs Water Company, Inc. to determine the purchase price of the water system prior to making a decision on how to proceed.

5.7 NEXT STEPS

The following are the recommended next steps for the East Montpelier Fire District #1:

- Approve report
- Begin discussions and possibly negotiations with Crystal Springs Water Company, Inc. regarding acquisition of the water system.

APPENDICES

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APPENDIX A

FIGURES

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LOCATION MAP

SCALE: 1"=3000'

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PROJECT LOCATION MAP

EVALUATION REPORT

EAST MONTPELIER FD #1

EAST MONTPELIER VERMONT

DESIGNED	NAP
DRAWN	JEN
CHECKED (PM)	JJD
CHECKED (PE)	JJD
SCALE	AS NOTED
DATE	FEB. 2013

PROJECT NO. 11027

FIGURE NO. 1

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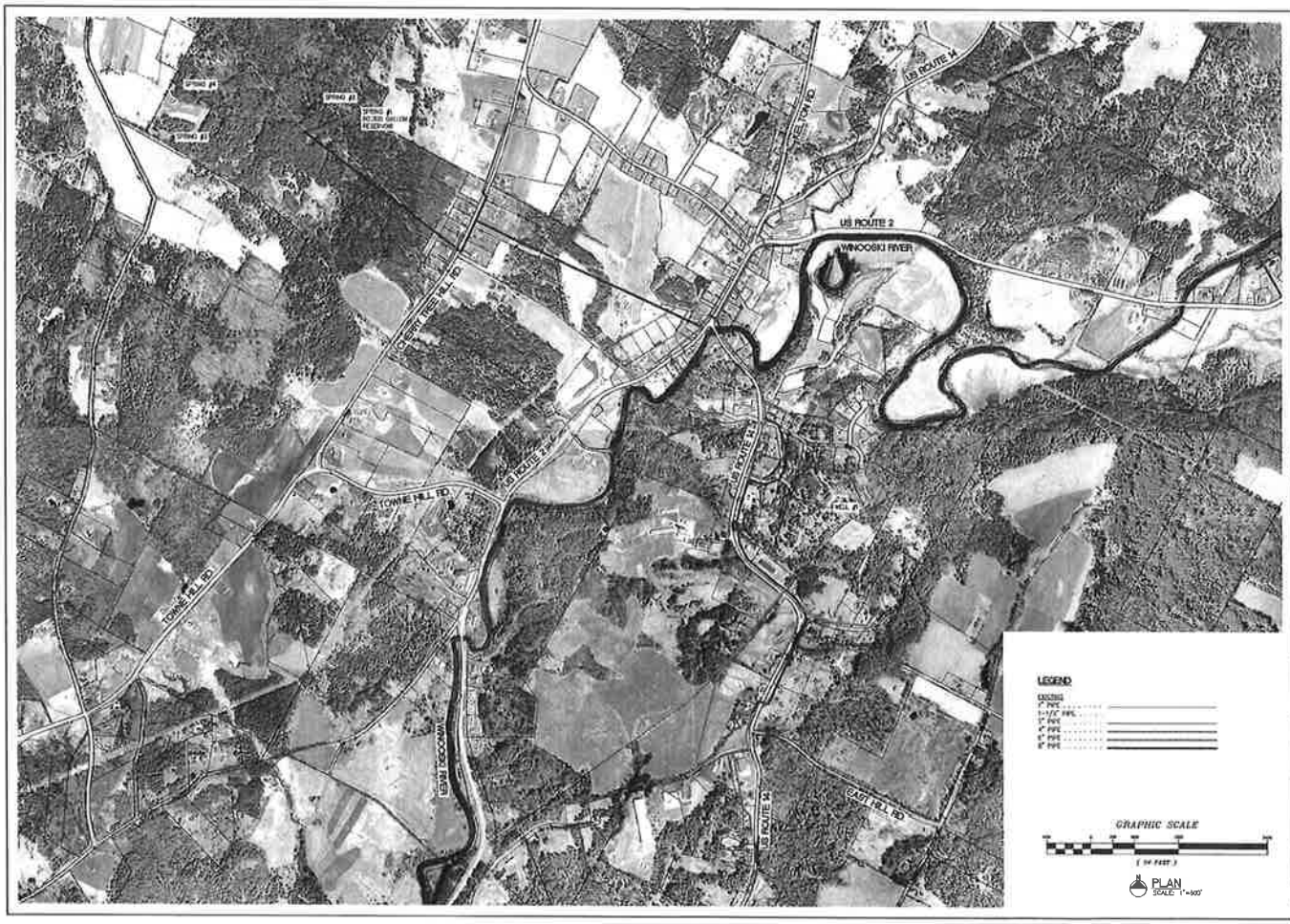

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EAST MONTPELIER FD#1, VERMONT

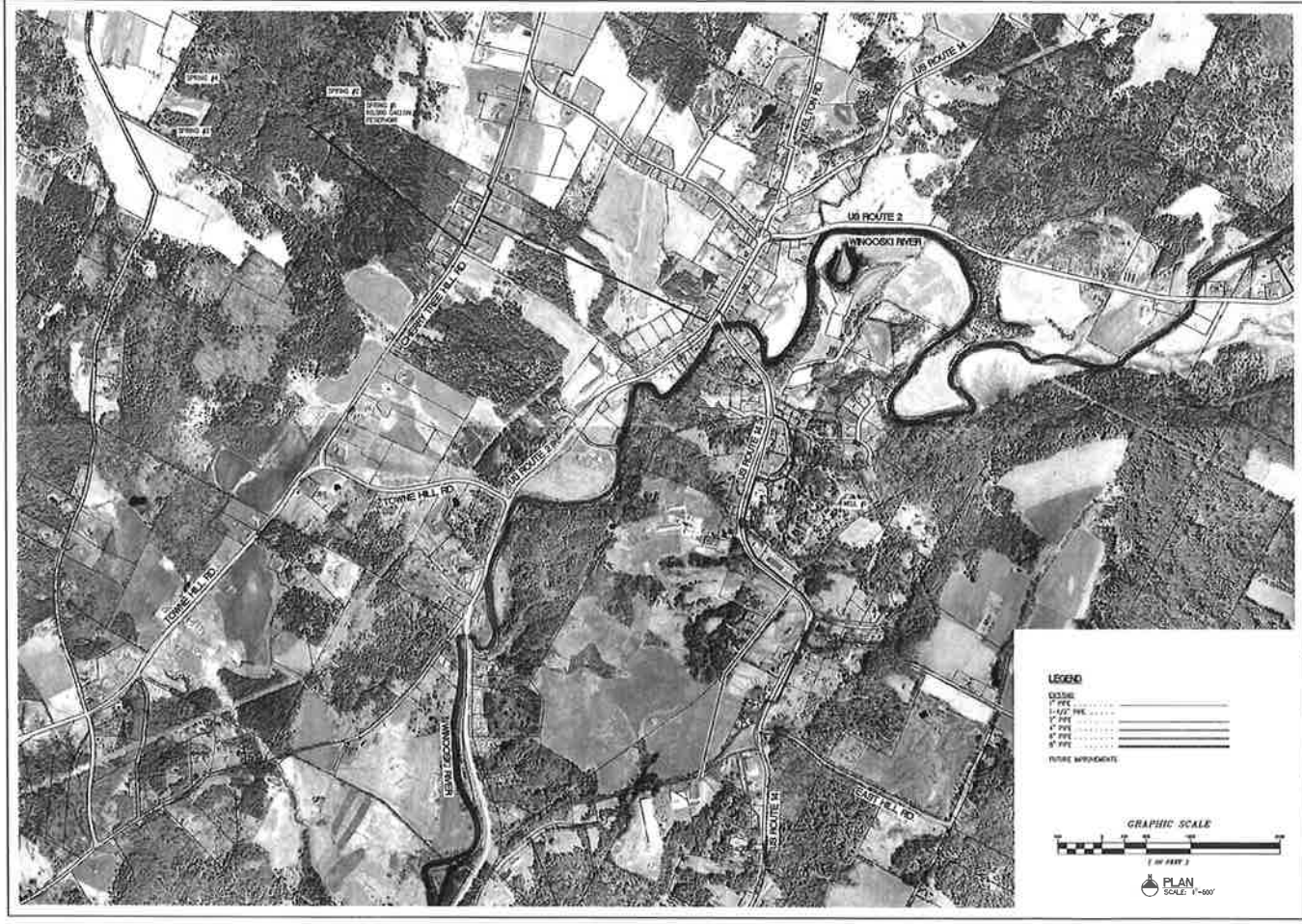
EVALUATION REPORT

WATER SYSTEM MAP

PROJECT NO. 11027

SHEET 2

Y:\11027-EAST MONTPELIER\11027-SITE.dwg, 7/30/2013 12:29:38 PM, E-7200 PS US



Aldrich + Elliott
6 Market Place, Suite 9
Essex Jct., VT 05452
P: 802 879 7733
AEengineers.com

EAST MONTPELIER FD#1, VERMONT

EVALUATION REPORT

FUTURE IMPROVEMENTS

PROJECT NO. 11027

FIGURE 3

Aldrich + Elliott
WATER RESOURCE ENGINEERS

APPENDIX B

TEMPORARY PERMIT TO OPERATE

VERMONT

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Water Supply Division
Old Pantry Building [phone] 802-241-3400
103 South Main Street [in-state] 800-823-6500
Waterbury, VT 05671-0403 [fax] 802-241-3284
www.vermontdrinkingwater.org

March 26, 2010

Attn: Wendell Fisher
PO Box 744
Barre, VT 05641

RE: Temporary Permit to Operate for the Crystal Springs Water System WSID# 5264

Dear Wendell:

Enclosed you will find the *new* temporary permit to operate for the Crystal Springs Water System. Please pay special attention to Section IV, as it outlines the specific deficiency of the system and a schedule for attaining compliance. The Water System must report the completion of each milestone established within this permit to the Division (Attn: Thomas Brown) within fifteen (15) days after the required completion date of the milestone, signifying it has been corrected. Additionally, there are remaining deficiencies that must be resolved which were identified in the most recent sanitary survey inspection. A copy of the sanitary survey inspection report has been attached for your convenience.

The Water System periodically applies chlorine disinfection treatment, but does not indicate each day whether disinfection is being applied to the water system on the monthly operation reporting forms. For each day that chlorine disinfection is applied the chlorine disinfectant residual entering the distribution system must be recorded and reported on the monthly operation reporting forms. Failing to monitor and report the daily disinfectant concentration entering, and within the water distribution system is a significant concern to the Division and a violation of the Water System's permit (see Section III, Items J & K).

The Water System is reminded that in the event of an intended change, or actual change in the ownership of a Public Water System, a written application for an operating permit shall be made by the prospective owner at least 30 days before the proposed change or actual change notifying the Division of the new ownership. This permit is not transferable or assignable and shall automatically become invalid upon a change of ownership of the Water System. Water System Officials Contact Form and Operating Permit Application must be submitted in the event of a change in ownership, these forms can be found on our website http://www.vermontdrinkingwater.org/permits.htm.

The Federal Ground Water Rule (GWR) became effective on December 1, 2009. The Water System is encouraged to take the time to become familiar with the requirements of the new rule, it can be found at the following web address: www.epa.gov/safewater/disinfection/gwr/regulation_factsheet_final.html. This new GWR outlines new monitoring and reporting requirements for water system's that disinfect.

As a reminder, the Water System must issue public notice within 30 days of the issuance date of the enclosed permit and on a six month schedule thereafter (see Section V) and submit the appropriate verification to the Division (attn Julie Hackbarth). The Water System must issue public notice until told otherwise by the Division.

If you have any questions regarding the information or requirements presented in this document, feel free to contact me toll free at (800) 823-6500, or on my direct line at (802) 241-4293. Please direct information regarding milestones or water system improvements to Thomas Brown toll free at (802) 241-3428.

Sincerely,

Ben Gauthier
Environmental Analyst III
Water Supply Division

cc: WSID #5264
Theodore Hedges, Water System Owner
Deane Hedges, Water System Operator
Thomas Brown, System Operations Specialist, WSD
Julie Hackbarth, Compliance & Certification Manager, WSD
Tim Raymond, Operations Section Manager, WSD
Permit File

enc: Public Notice Certification Form
Copy of May 27, 2008 Sanitary Survey Inspection Report
Blank Monthly Operation Reporting Forms for Groundwater Systems

VERMONT

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Water Supply Division
Old Pantry Building [phone] 802-241-3400
103 South Main Street [in-state] 800-823-6500
Waterbury, VT 05671-0403 [fax] 802-241-3284
www.vermontdrinkingwater.org

March 26, 2010

Public Water System Temporary Permit to Operate

WATER SYSTEM IDENTIFICATION NUMBER: **5264** PIN #: **BR95-0073**

OWNER/PERMITTEE: **Theodore Hedges**
WATER SYSTEM: **Crystal Springs Water System**
TOWN: **E.Montpelier**

AUTHORIZED REPRESENTATIVE: **Wendell D. Fisher**
ADDRESS: **PO Box 744**
Barre, VT 05641

I. Authority

In accordance with 10 V.S.A. §1671 *et seq*., the following findings and conclusions have been made for the **Crystal Springs Water System (the Water System)**. The Department of Environmental Conservation, Water Supply Division (Division) has determined that the operation of this Public Community Water System does not presently comply with the Vermont Water Supply Rule (WSR) without meeting certain conditions, and that the system, subject to the following conditions, and in accordance with the following compliance schedule, will not unreasonably contribute to a public health risk; therefore, a temporary operating permit is hereby issued.

II. Findings and Conclusions

A. Based upon the results of the most recent sanitary survey, it has been determined that the **Crystal Springs Water System** does not presently comply with the requirements of the WSR identified below. The permittee shall comply with the schedule for compliance in Section IV, Item C to bring the Water System into full compliance with the Federal Safe Drinking Water Act, the Vermont Water Supply Rule.

1. *Inadequate Monthly Reporting*: In accordance with the Vermont Water Supply Rule (WSR), Subchapter 21-9, all Public Water Systems providing treatment must submit a signed report to the Secretary at least once per month no later than ten (10) days following the end of the month that details the total amount of water produced for the Water System that month and the daily residual chemical concentration entering the distribution system, if a disinfectant is added. The Water System has been submitting monthly reports to the Division; however, the Water System has been introducing chlorine to the system periodically and has not been including the daily chlorine residual entering the distribution system each day that chlorine is being introduced on the monthly operation reporting forms.

2. *Distribution Meter Maintenance Required:* In accordance with the WSR, Chapter 21, Appendix A, Part 2, all water supplies shall have an acceptable means of metering the finished water. The Water System has installed a meter in each of the storage tanks so that the total amount of water produced by the system can be accurately measured. These meters

are operated and monitored so that they function as a master meter. The Water System also has a meter (the old master meter) which remains installed but is no longer operational. This old master meter is located at the end of the transmission main that connects the storage tank to the distribution system. Due to considerable length of this transmission main, the Division requests that the old master meter be repaired or replaced and monitored in a regular basis so that the integrity of the transmission main is monitored and documented.

B. Summary of the Public Water System's physical conditions:

1. The date of the most recent sanitary survey inspection was May 1, 2007. System specific information may be referenced in the most recent sanitary survey or preceding surveys.

2. Major Findings:

a) Source:

There are three permitted springs serving the Water System; "Spring #1" (WL001), "Spring #2" (WL003), and "Spring #4" (WL004) with a combined permitted yield of 50 gallons per minute (gpm).

b) Treatment:

The Water System provides the capability of continuous disinfection via an erosion chlorinator, but currently applies disinfection for less than 6 months out of a calendar year.

c) Storage:

There are two pre-distribution storage facilities serving the Water System; "Reservoir" (ST001) a 40,000 gallon concrete storage tank and "Spring #1 Storage" (ST002) a 17,952 gallon concrete storage tank.

d) Booster/Pump Stations:

Water flows by gravity from the springs to the storage tanks and to distribution.

e) Distribution:

The distribution system consists of 8-inch diameter PVC, and 4 and 6-inch diameter asbestos cement piping.

f) Population Served:

The Water System serves a year-round residential population of approximately 300 people through 115 service connections.

g) System Demand:

The average daily demand of this system, based on source meter readings, is 23,442 gallons per day (gpd). The maximum daily water demand of this system, based on source meter readings, is approximately 45,000 gpd.

h) System Reserve:

The Water System is *not permitted* to add new service connections or expand existing water demand requirements without first demonstrating reserve capacity as prescribed under Appendix A, Part 2 of the WSR and Section IV, Item 2 of this permit.

C. Summary of most recent water quality sample results:

The most recent water quality results demonstrate that all drinking water quality requirements specified under the WSR, Subchapter 21-6, and in 40 CFR, Part 141 (WSR Appendix E) are in compliance with the established Maximum Contaminant Levels (MCLs) to ensure the protection of public health and welfare (See Section III, Item H).

D. Groundwater Under The Direct Influence of Surface Water Determination:

All three permitted sources were determined to be not under the direct influence of surface water on July 13, 1995. These determinations were based upon the Division's review of microscopic particulate analysis test results from each source.

E. Isolation Zone:

Isolation zones are prescribed by the WSR, Appendix A, Part 3.3. The only reported land use activity occurring within 200 feet of the permitted springs is *agricultural activity on the adjacent Brazier Property*. This land use activity could compromise water quality; however, current water quality data indicates no evidence of drinking water contamination. A complete inventory of land use activities will be determined when a Source Protection Plan is submitted to the Division for review and approval. The source isolation zones and land use requirements, including prohibited land uses, are to be maintained in accordance with each source's approval and permits.

F. Operating Status:

•The Division approved a Bacteriological Sampling Plan March 28, 1996.

• The Water System is collecting lead and copper samples in accordance with an approved lead and copper sampling plan. The Water System must submit a new lead and copper sampling plan to the Division for approval if the Lead and Copper sampling results and/or the Federal rule require sampling location changes in the future.

•The Division has not received an Operation and Maintenance Manual as of the issuance date of this permit (see Section IV, Item C, Part 3).

•The Division last approved a Source Protection Plan update on April 13, 2009 (See Section III, Item P).

G. Certified System Operator(s):

The certified operator for this **Class 2** water system is **Deane Hedges,** (Operator ID #2353, Class 2). Whose current certification expires **June 30, 2011** (see Section III, Item I).

III. General Conditions

A. Only the following permitted sources shall be connected and supply water to the Water System:

Source #	Source Name	VT Source Type	Source Use	Yield (gpm)
WL001	Spring #1 10 gpm	Spring	Permitted	50(combined
WL003	Spring #2 30 gpm	Spring	Permitted	permitted
WL004	Spring #4 10 gpm	Spring	Permitted	yield)

B. The person to whom this permit is issued must comply in full with all applicable provisions of 10 V.S.A. §1671 *et seq.*, the rules adopted thereunder, and the Federal Safe Drinking Water Act and subsequent regulations.

C. This permit may be suspended or revoked in accordance with 10 V.S.A. §1675, and WSR, Subchapter 21-3.

D. This permit is not transferable or assignable and shall automatically become invalid upon a change of ownership of the Water System.

E. The permittee shall post the current and valid operating permit or temporary operating permit in a conspicuous place at the public water system headquarters or treatment plant.

F. The permittee shall contact the Division before beginning any modifications to a water supply system (e.g., source deepening, reconstruction, treatment, etc.). The permittee shall obtain written approval or required permits before proceeding with modifications to a public water system.

G. The permittee shall notify the Division *prior* to using a non-permitted water source to supply water to the water system (e.g., emergency source connection, hauled or bulk water delivery). The permittee shall immediately issue a Boil Water or Do Not Drink notification to all its users upon use of a non-permitted source, and as otherwise directed by the Water Supply Division. For calls placed within Vermont during Division office hours call 800-823-6500 or 802-241-3400, calls placed after 4:30 p.m. and weekends call 802-741-5311 (pager).

H. The permittee shall notify the Division immediately (and no later than 24 hours) following any test result greater than or equal to the Maximum Contaminant Levels (MCL), Maximum Residual Disinfectant Levels (MRDL), or turbidity levels as specified under 40 CFR, Part 141 (National Primary Drinking Water Regulations).

I. *Certified Operator*: The permittee shall be a certified operator or shall place the direct supervision of the Water System under the responsible charge of a certified operator. The owner shall be accountable for all responsibilities and duties pursuant to Subchapter 21-12 of the WSR. If the permittee is not a certified operator, the permittee shall designate a certified operator to carry on the daily operations of the system; this designation shall be made in writing, signed by both the owner and the certified operator, and available to the State upon request. The certified operator shall hold a valid certification equal to or greater than the classification of the treatment facility and distribution system.

The permittee must have a designated certified operator in responsible charge available at all times. "Available" means based on system size, complexity, and source water quality, a certified operator must be on site or able to be contacted as needed to initiate the appropriate action in a timely manner. For Water Systems which only have one certified operator on record, the permittee must notify the Division within 24 hours of changing their certified operator.

J. *Monitoring Requirements*: The permittee shall comply with all of the Drinking Water Quality Monitoring Requirements pursuant to the WSR, Subchapter 21-6 *et seq*. To the extent that such requirements are not set forth in the aforesaid Rule or corresponding federal regulations, the Water Supply Division of the Vermont Agency of Natural Resources shall notify the permittee by mail of such requirements. Failure to monitor and report in accordance with the aforesaid requirements shall constitute a violation of this permit. Sampling schedules can be found on our website at http://www.vermontdrinkingwater.org. These schedules are updated every quarter to reflect changes in your schedule, and sampling points, requirements.

K. *Reporting Requirements*: The permittee must submit a signed report to the Division *once a month* (as required by WSR, Subchapter 21-9) *no later than ten (10) days following the end of the month*, with the following information:

1. A summary of the Public Water System operation, including amount of water produced for each source.

2. Daily disinfectant residual entering the distribution system for each day that disinfectant is introduced. If disinfection is not applied, the Water System shall indicate that no disinfectant was introduced.

In addition, the Water System must report disinfectant residual in the distribution system at a location and frequency corresponding to the bacteriological sampling plan, and verify the free chlorine concentrations (if no free chlorine is available, the Water System must measure total chlorine concentration as well) on the laboratory reporting form.

L. The permittee shall pay all fees as required for public water supplies pursuant to 3 V.S.A. §2822. Nonpayment of fees shall be considered a violation of this permit.

M. The permittee shall operate the water system in a manner consistent with the system's Operation & Maintenance Manual as approved by the Secretary in accordance with Subchapter 21-7 and Appendix D of the Water Supply Rule. The Secretary recommends the O & M Manual be amended as needed when significant changes are made to the infrastructure and operations to the system, to insure the manual remains useful to the system owners and operators.

The O & M Manual shall be readily available to all owners and operators for the system, in order to assist them with the daily operations of the system. The Secretary may require an owner to develop a new O & M Manual and submit it for approval if the current manual cannot be located upon request of the Secretary.

N. Any duly authorized representative of the Agency may upon presentation of appropriate credentials:

1. Inspect or investigate any portion of the permittee's property, fixtures, or other appurtenances belonging to or used by the permittee for the operation and maintenance of any water system regulated by the Secretary;

2. Sample, monitor, or test any regulated water system;

3. Gain access to and copy any records, reports or other documents related to the operation and maintenance of the water system;

4. Perform necessary corrective actions to the system to prevent or decrease a public health risk.

O. Pursuant to 10 V.S.A., Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Court within 30 days of the date of the decision. The appellant must attach to the Notice of Appeal the entry fee of $225.00, payable to the State of Vermont.

The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal.

The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings.

For further information, see the Vermont Rules for Environmental Court Proceedings, available on-line at www.vermontjudiciary.org. The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641 (Tel. #802-828-1660).

P. The Source Protection Plan (SPP) shall be updated by the permittee every three years in accordance with the WSR, Subchapter 21-16. The next SPP update will be due by **October 26, 2011**.

IV. Special Conditions

A. **This permit expires on February 1, 2014.** The expiration of this permit does not relieve the Water System of the responsibility to function satisfactorily (WSR, Chapter 21), nor does it limit the permittee's responsibility or liability for the conditions specified in this permit, or other applicable statutes and rules.

B. Reapplication: The permittee shall submit a complete application for a permit prior to the expiration date of this permit. The permittee shall reapply between **January 1, 2014** and the expiration date of this permit. In addition, the permittee is responsible for responding to the most recent sanitary survey inspection report, to ensure current and reliable information is available to the Division in its preparation of the operating permit.

C. Schedule for Compliance:

Based on the foregoing Findings and Conclusions, the permittee shall comply with the following schedule to bring the **Crystal Springs Water System** into full compliance with the Federal Safe Drinking Water Act, the Vermont Water Supply Rule, and all applicable statutes and regulations. This schedule may be modified or amended by the Division *prior to the expiration date of the permit or upon request by the permittee.*

1. **April 10, 2010** — **Submit Complete Monthly Operation Reports**

The Water System must record the daily chlorine disinfection residual entering the distribution system and the daily total amount of water produced on the monthly reporting forms. If no chlorine disinfection treatment is provided, the Water System must indicate that no treatment was applied. The first *complete* monthly operation report (which will represent the remainder of the March 2010 reporting period) is due by April 10, 2010.

2. **July 1, 2010** — **Repair Distribution Meter Vault and Record Meter Readings**

The Water System must repair the distribution system meter vault so that it meets the requirements of the WSR by July 1, 2010. Once the distribution system meter vault has been repaired, the Water System must record daily distribution meter readings from this location. The data will be evaluated when considering the status of the moratorium on future system expansion (see Section II, Item B Part 2h above).

3. **The Water System must resolve all remaining minor deficiencies identified in its most recent sanitary survey inspection report.**

4. Non-compliance with the schedule set forth herein may result in the imposition of injunctive relief and/or penalties, including, but not limited to, penalties set forth in 10 VSA, Chapter 201 and/or 211.

5. The Water System must report the attainment of the milestones established within this permit to the Division within fifteen (15) days after the required completion date of the milestone, signifying it has been attained. If the milestone has not been attained, the Water System shall document the reasons for non-compliance and shall request in writing that the Division revise the permit.

V. Public Notice Requirements

In accordance with 10 V.S.A. §1676(b)(2) and the WSR, Subchapter 21-10 §10.2 *et seq.*, the permittee shall inform all persons using the system of the nature and extent of noncompliance with federal and state statutes and regulations.

A. The following methods of notification shall be followed:

1. Through publication in a local daily or weekly newspaper, radio, television, hand delivery, or direct mailings, and another method as needed to reach all customers served by the system ***within 30 days of the effective date of this permit***.

2. Repeat notification shall be made every 6 months (January 1st and July 1st) by hand delivery or direct mail (e.g. water bill), or otherwise directed by the Division.

3. ***Within ten days of issuing the initial public notice***, and following each repeat notification, a signed copy of the notice you issued, along with a copy of the attached Public Notice Certification form shall be sent to: ***Water Supply Division, Attn: Julie Hackbarth, The Old Pantry Building, 103 South Main Street, Waterbury, VT 05671-0403.***

B. The following language shall be contained in all public notices until such time as the Division informs you in writing that the public notice may be amended:

The **Crystal Springs Water System (the Water System)**, a public water system under the laws of the State of Vermont, was recently reissued a Temporary Operating Permit. The Secretary of the Agency of Natural Resources found that such issuance will not unreasonably contribute to a public health risk, although the **Crystal Springs Water System** does not presently comply with certain requirements of the Federal Safe Drinking Water Act and applicable state statutes and rules. The nature and extent of the noncompliance are as

follows:

The Water System does not correctly record and report the drinking water treatment it provides as required by the Vermont Water Supply Rule. The Water System is following through on specific recommendations made by the Water Supply Division to eliminate this and other potential sanitary hazards and provide for future system durability and reliability. In accordance with the Vermont Water Supply Rule, the Division has requested the timely resolution of all water system deficiencies including the timely repair/replacement of the distribution system meter vault. To obtain more specific information regarding these necessary public drinking water improvements, please call Wendell Fisher of Crystal Springs Water System at (802)476-5330.

Agency of Natural Resources
Department of Environmental Conservation
Justin Johnson, Commissioner

By _____
Gary Schultz, Director
Water Supply Division

Dated at Waterbury, Vermont this 26th day of March, 2010

BG

cc: WSID #5264
Theodore Hedges, Water System Owner
Deane Hedges, Water System Operator
Thomas Brown, System Operations Specialist, WSD
Julie Hackbarth, Compliance & Certification Manager, WSD
Tim Raymond, Operations Section Manager, WSD
Permit File

enc: Public Notice Certification Form
Copy of May 27, 2008 Sanitary Survey Inspection Report
Blank Monthly Operation Reporting Forms for Groundwater Systems

Aldrich + Elliott
WATER RESOURCE ENGINEERS

APPENDIX C

SANITARY SURVEYS

VERMONT

Vermont Department of Environmental Conservation
Drinking Water and Groundwater Protection Division
One National Life Drive - Main 2
Montpelier, VT 05620-3521
www.drinkingwater.vt.gov

[phone] 802-241-3400
[in-state] 800-823-6500
[fax] 802-828-1541

Agency of Natural Resources

June 18, 2013

Deane Hedges
96 Terrace Street
Montpelier, VT 05602

Re: Sanitary Survey, Crystal Springs Public Community Water System, East Montpelier, VT, WSID #5264

Dear Mr. Hedges:

A sanitary survey of the Crystal Springs Water System (the Water System) was conducted on May 31, 2013. Ben Montross and Megan Young represented the Vermont Department of Environmental Conservation, Drinking Water and Groundwater Protection Division (the Division); you and Malcolm Grandfield represented the Water System; and Steve Gilman represented East Montpelier Fire District 1. The Water System was issued a Temporary Permit to Operate on March 26 that will expire on February 1, 2014. The Water System must re-apply for a Permit to Operate between January 1 and January 31, 2014. Pursuant to the sanitary survey, the Division is requiring the Water System to apply continuous disinfection **until it corrects items 3 and 8 below and receives written notice from the Division stating that chlorination is no longer required.** During the sanitary survey and file review the following significant deficiencies were identified which must be corrected:

1. *Inadequate Monthly Reporting*: Under Chapter 21, Section 9.1.2 of the Vermont Water Supply Rule (Rule), all public community water systems shall submit a signed report to the Secretary at least once a month no later than 10 days following the end of the month, with a summary of the water system operation including the metered amount of water produced and the results of chlorine residual analysis taken at the entry point of the distribution each day that a disinfection is applied. If a free chlorine residual is unable to be observed, the Water System must report the total chlorine residual and report that value. The Water System is currently submitting monthly reports including metered production data; however, it is not reporting the daily chlorine residual at the entry point to the distribution system for each day that disinfection is applied. The Water System must submit accurate monthly reports including the daily chlorine residual taken at the entry point to the distribution system. **The compliance date for this deficiency is August 10, 2013; this represents the July 2013 reporting period.**

2. *Inadequate Chlorine Residual Recording on Bacteriological Sampling*: Under Chapter 21, section 6.1.1 of the Rule, Public water systems shall comply with the routine sapling and repeat sampling requirements established in Chapter 21 section 6 and 40 CFR parts 141 and 143. 40 CFR Part 141.132 (c) states that community water systems that use chlorine must measure the residual disinfectant level in the distribution system at the same point in the

distribution system and at the same time as total coliforms are sampled. This concentration must be indicated on the sampling form submitted with the water sample. The Water System has indicated on several monthly reports that it has been applying chemical disinfection; however, the bacteriological sampling results have not included a chlorine residual. The Water System must sample and report the free chlorine residual at the time and location of the monthly bacteriological sample. If a free chlorine residual is unable to be measured, total chlorine must be sampled and reported. **The Water System must include the result of chlorine residual analysis with all future bacteriological samples effective immediately.**

3. *Inadequate Source Cover Construction*: Under Chapter 21, Appendix A, section 3.3.2.1.2 of the Rule, Spring and shallow well site construction shall include: a) accessible entrance with lock; b) screened openings; c) runoff diversion berm located 50 feet upslope where feasible; d) back fill material of high clay content sloping away from the structure; e) minimum of 4 inches of top soil over the clay; and f) a watertight sanitary cover. The covers on Spring 2 and Spring 4 are constructed of pressure-treated lumber and plywood. The construction is not sanitary in nature and must be re-constructed using materials approved for public drinking water system applications. Possible solutions were discussed during the survey. The Water System must re-construct the source spring access hatches/covers using sanitary materials. **The Water System is required to apply continuous disinfection until it corrects this deficiency and receives written notice from the Division stating that chlorination is no longer required. The compliance date to re-construct the spring covers is December 1, 2013.**

4. *Cross-Connection Hazard – Unapproved In-Home Booster Pumps*: Under Chapter 21, Appendix A, section 6.4.4 of the Rule, individual home booster pumps shall not be allowed for any individual service connection to the Public water system, unless installation is approved in writing by the Secretary, includes a properly sized and located air gap, and conforms to the Secretary's guidelines. During the survey it was reported that the Water System serves two connections with in-home storage tanks and in-home booster pumps. The Water System is unable to certify whether the construction has been approved by the Secretary and cannot confirm adequately sized and located air gaps are present at these connections. The Water System must remove these pumps or seek approval from the Secretary for the installation of approved air gap systems. Under Chapter 21, Appendix A, section 8.1.1 of the Rule, the Water System must be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. The normal operating pressure of the distribution system should be approximately 60 psi and not less than 35 psi without the use of in-home booster pumps. Please contact Greg Bostock, Division Engineer, with any questions pertaining to in-home booster pumps, suitable air gap construction for in-home pumps, and for guidance on eliminating cross connection hazards to the Water System. Greg may be reached at 802-498-7464 or by email at greg.bostock@state.vt.us. **The compliance date to remove or obtain approval from the Secretary for the construction of the in-home booster pumps is November 1, 2013.**

5. *Inadequate Fire Hydrant Construction*: Under Chapter 21, Appendix A, section 8.1.2 of the Rule, the minimum size of water main for providing fire protection and serving fire hydrants shall be eight inches in diameter. Additionally, under Chapter 21, Appendix A, section 7.0.1 of the Rule, storage facilities shall have sufficient capacity, as determined from engineering studies, to meet average daily domestic demands, and where fire protection is provided, fire flow demands. When fire protection is provided, the minimum flow requirement shall be

500 gpm at 20 psi system residual pressure for a 2-hour duration for residential structures (this equates to a minimum of 60,000 gallons designated for fire protection). The Water System has two sections of 4-inch distribution main at different locations in the distribution system and has a total of 40,000 gallons of storage. Although the spring box contains approximately 20,000 gallons, the Water System reports that the outlet from the spring is valved in a manner to only allow 10gpm to enter the distribution system. Based on the Water System's construction it was not permitted for nor can it provide fire protection. In order to address this deficiency, the Water System must remove the fire hydrants. Alternately, it may permanently convert the fire hydrants to flushing hydrants by performing all the following requirements: 1) weld the 4-inch "steamer nozzles" shut; 2) pain the hydrants black; and 3) inform the local fire department, in writing, that the hydrants are not to be used for fire protection purposes. The Water System expressed its desire in performing the necessary system upgrades in order to be able to provide fire protection. Additional engineering studies, a hydraulic analysis, and a Permit to Construct from the Division will be required prior to any system modifications or improvements. Should the Water System wish to maintain the fire hydrants in hopes of someday providing fire protection, it must submit an improvement plan to the Division identifying proposed improvements and an improvement schedule. Additionally, as a short-term remedy, the Fire Hydrants must be painted black, the access to the 4-inch "steamer nozzles" must be limited using locks, chains, etc. and the local fire department must be made aware of the limitations of the hydrants. **The compliance date to submit an improvement plan identifying the Water System's intended course of action is November 1, 2013; additional compliance dates will follow based on the intended course of action. Should the Water System decide not to pursue the system upgrades in order to provide for fire protection, the compliance date to remove or permanently modify the fire hydrants, converting them to flushing hydrants is November 1, 2013.**

6. *Storage Tank Alarms/Level Controls*: Under Chapter 21, Appendix A, section 7.0.1 (c), level control is recommended but low water level alarm is required for public community water system. The Water System does not have a low level alarm or a means of controlling storage tank volume. While not required by Rule, the Secretary has the authority to require level controls in storage tank. Due to the construction of the current storage and spring systems, when chlorinating, there is no means by which the Water System is able to control the storage tank level to prohibit a chlorinated overflow from the storage tank. The Secretary will not permit a Water System to have a chlorinated overflow from a storage tank. The Water System must install float level controls on the spring lines serving the water storage tank or some other means of controlling the storage tank levels and to prevent discharge of a chlorinated overflow when applying chlorine disinfection. Possible solutions for the storage tank alarms were discussed during the sanitary survey. **The compliance date to install level controls and a low level alarm is December 1, 2013.**

The following minor deficiencies were observed and must be corrected:

7. *Disinfection Capabilities*: Under Chapter 21, Appendix A, section 4.3.2(a) of the Rule, chlorine should be applied at a point which will provide adequate contact time. Chlorine is currently only applied to water flowing from Spring 4 as it enters the water storage tank, where it is then introduced to water produced from Spring 2; the Water System does not have a means of applying disinfection directly to water produced by Spring 2. The Water System is unable to apply disinfection directly to Spring 1; in order to disinfect water produced by

Spring 1 the water must mix with chlorinated water from the storage tank in the distribution piping prior to the first service connection. It is uncertain whether there is adequate disinfection contact time during all conditions of flow based on the current construction. Additionally, under Chapter 21, section 4.0.1 of the Rule, no person shall begin construction of, alter, renovate or convert for use as a public water system requiring a permit, any system or any portion thereof without first receiving a Construction Permit. Based on Division records, it appears as though the Water System has modified the treatment facility without first receiving a Construction Permit. The Water System must provide additional information about disinfection contact time in order to re-calculate the 4-log inactivation of virus concentration and ensure adequate disinfection contact time. This includes as-built drawings of the chemical injection system, storage facility, drawings and information about Spring 1 construction and inter-connection with the storage facility, and information about the length and diameter of piping in the distribution prior to the first service connection in which additional disinfection contact time is provided. **The compliance date to submit the requested information is October 1, 2013.**

8. *Underwater Supply Line Crossing*: Under Chapter 21, Appendix A, section 8.7.2 of the Rule, a minimum cover of two feet shall be provided over the pipe for all underwater crossings. The supply line running from Spring 4 to the treatment/storage facility crosses under a stream. This crossing has become exposed due to flooding and increased runoff and must be re-bedded a minimum of two feet below the streambed. **The Water System is required to apply continuous disinfection until it corrects this deficiency and receives written notice from the Division stating that chlorination is no longer required. The compliance date to re-bed the supply line as it crosses the stream is December 1, 2013.**

9. *Overflow Screen Construction*: Under Chapter 21, Appendix A, section 7.0.8 of the Rule, all water storage structures shall be provided with an overflow which should terminate 12 to 24 inches above the ground surface and discharges over a drainage inlet structure or a splash plate. The overflow shall be screened with 24 mesh non-corrodible screen at a location least susceptible to damage by vandalism. The screens on the overflow pipes for the spring 4 collection box and the water storage tank have become torn and must be replaced. **The compliance date to replace the overflow screens is August 1, 2013.**

10. *Storage Tank Inspection Overdue*: Under Chapter 21, section 7.1.2 of the Rule, all water storage tanks shall be comprehensively inspected, inside and out, within 10 years of being placed into service and every 5 years thereafter. The Water System reports that the storage tank serving the Water System has not been comprehensively inspected and, if necessary, cleaned, within the last 5 years. The Water System must perform a comprehensive storage tank inspection. **The compliance date to perform a comprehensive storage tank inspection is December 1, 2013.**

11. *Storage Tank Access Construction*: Under Chapter 21, Appendix A, Section 7.0 of the Rule, the materials and designs used for finished water storage structures shall provide stability and durability as well as protect the quality of the stored water. The water storage tank/spring 1 collection box is served by a wooden cover/frame with a vinyl/plastic insert which is nailed to a plywood cover. The supporting frame around the opening of the access way is framed with wood. The current construction does not protect the quality of the stored water in the storage tank. While this access way is located within a locked building, the materials used do not promote the sanitary protection of the water. The access hatch and supporting frame must

be constructed of materials designed for drinking water applications and that protect the sanitary quality of the water produced/stored. **The compliance date to re-build the storage tank access using materials designed to protect the sanitary quality of the water within the tank is December 1, 2013.**

12. *Master Meter Repair/Replacement*: Under Chapter 21, Appendix A, section 2.14 of the Rule, all water systems shall have an acceptable means of metering the finished water. The Water System installed a meter pit near where the transmission line meets Cherry Tree Hill Road but reports that the meter has never worked as intended. The repair of this meter was included as a compliance activity in the Water System's Temporary Permit to Operate issued on March 26, 2010 which established a compliance date of July 1, 2010 for the repair. To date the Water System has not repaired/replaced this meter. While the Water System is able to utilize two smaller 1 ½-inch meters one each in the spring box and water storage tank, this master meter must be repaired. There is question whether the two 1 ½-inch meters are able to provide adequate hydraulics for the 8-inch distribution main, especially under peak demand. The restricted flow due to these meters will not supply adequate volume in order to meet minimum requirements for fire protection. As part of the Water System's improvement plan required in item 5 above, should the Water System wish to make necessary corrections in order to provide fire protection, the Water System must include its plans to address the metering of the system and the adequacy of the current meters to meet the system demands should it decide not to provide fire protection. **The compliance date to submit an improvement plan to address the meter is November 1, 2013.**

13. *Source Protection Plan Update Overdue*: Under Chapter 21, section 16.3 of the Rule, Source Protection Plans shall be updated by Public Water Systems every three years. The updates shall be submitted to the Secretary for review and approval. The Water System's last Source Protection Plan Update was approved by the Secretary on April 13, 2009 and is now overdue for submission for review and approval. Please contact Scott Stewart, Hydrogeologist, at scott.stewart@state.vt.us or by phone at 802-585-4910 with any questions or for assistance in preparing the Source Protection Plan Update. **The compliance date to submit a Source Protection Plan Update is December 1, 2013.**

14. *Required Disinfection By-Product (DBP) Monitoring and Monitoring Plan (Stage 2)*: Under Chapter 21, section 6.4 of the Rule, Public Water Systems which add a chemical disinfectant to the water in any part of the drinking water treatment process shall comply with the provisions of 40 CFR, Part 141, Subpart V. The Water System has not collected water quality samples for DBPs however has routinely chlorinated and is required to apply continuous disinfection until it resolves deficiencies identified in items 3 and 8 above. The Water System is required by Rule to submit a Stage 2 DBP Compliance Monitoring Plan, including a distribution system map, for Water Supply Division review and approval before October 1, 2013, by which time it must begin Stage 2 Compliance Monitoring. Questions related to DBP sampling plans may be directed to Doug Kievit-Kylar of the Division at 802-585-4891 or doug.kievit-kylar@state.vt.us. The Water System must comply with all DBP monitoring requirements and any treatment requirements set forth by the Division. **The compliance date to address this deficiency is October 1, 2013.**

15. *Annual Testing of Backflow Prevention Device at Farm Overdue*: Under Chapter 21, section 8.1.1 of the Rule, any physical connection with a non-potable source of water shall include an adequate backflow prevention device which meets the requirements of American Water

Works Association (AWWA) Standards. AWWA standards for backflow prevention devices include annual field testing. There is one backflow prevention device serving the Water System. This device has not been tested within the last year. The Water System must contract with a certified professional in order to perform testing of these devices and any other testable devices that are serving the Water System. **The compliance date to perform all necessary backflow prevention device testing is October 1, 2013.**

The Water System must address the deficiencies identified above by the specified dates unless the Water System submits a written description of the good cause for its inability to meet those dates together with proposed alternate compliance dates. If the Division does not receive a response from the Water System requesting alternate dates, the dates identified above will be entered into a compliance schedule within the Water System's Permit to Operate.

Recommendations for consideration by the Water System:

1. Weld a cap on abandoned well: During the survey it was observed that the abandoned well near Spring 2 did not have any sort of cap on it. The Water System reported that there used to be a cap welded to the casing, but it was removed in order to check the integrity of the abandonment of the well. The Division recommends welding another cap on the casing as an additional layer of protection.

2. Remove or cap bulk water hauling hydrant: During the survey the old bulk hauling hydrant/connection was located downhill of the storage/treatment building. This piping is no longer utilized by the water system; the Division recommends the hydrant be removed and the piping capped in order to reduce any potential contamination to the storage tank.

3. Recommend updating O&M to reflect current operation and maintenance of Water System: The Water System's Operation and Maintenance (O&M) Manual was approved in 2001 and additional system improvements have been made since that time. Especially considering the Water System may be acquired by East Montpelier Fire District 1, a detailed, thorough, and up-to-date O&M Manual would be a great asset for the Fire District. The Division recommends the Water System update its O&M Manual to accurately reflect the current construction, operation, and maintenance of the Water System.

We appreciate you and Malcolm meeting with us in order to conduct the sanitary survey of the Crystal Springs Water System. We look forward to working with you both in the future. If you have any questions or would like to discuss anything on the survey, please feel free to contact me at the address above, by email at ben.montross@state.vt.us, or by phone at 802-498-8981.

Sincerely,

Benjamin L. Montross
System Operations Specialist

c. Tim Raymond, Operations and Engineering Section Chief, DWGWP
Julie Hackbarth, Compliance and Certification Manager, DWGWP
Greg Bostock, Division Engineer, DWGWP
Steve Gilman, East Montpelier Fire District 1
Joe Duncan, Aldrich and Elliott, PC
Megan Young, System Operations Specialist, DWGWP
WSID File #5264

VERMONT

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Water Supply Division
Old Pantry Building [phone] 802-241-3400
103 South Main Street [in-state] 800-823-6500
Waterbury, VT 05671-0403 [fax] 802-241-3284
www.vermontdrinkingwater.org

January 12th 2011

Crystal Springs Water System
Attn: Mr. Wendell Fisher
PO Box 744
Barre VT 05641

Re: Sanitary Survey, Crystal Springs Water System a Public Community Water System, East Montpelier VT, WSID #5264

Dear Mr. Fisher,

A sanitary survey of the Crystal Springs Water System (the Water System) was conducted on October 22nd 2010. Rob Farley represented the Vermont Department of Environmental Conservation, Water Supply Division (the Division) and Dean Hedges represented the Water System. The Water System was issued a Temporary Permit to Operate (TPO) on March 26th 2010 which will expire on February 1st 2014. The deficiencies identified in this survey are long standing issues documented in previous survey, Operating Permits and other correspondence. The following *minor* deficiencies have been identified during the sanitary survey, including file review, and need to be corrected:

1. *Inadequate Storage Volume (fire-fighting)/Distribution (hydrants)*: In accordance with the Vermont Water Supply Rule (WSR), Chapter 21, Appendix A, Part 7, storage facilities shall have sufficient capacity, as determined from engineering studies, to meet average daily domestic demands (ADD), and where fire protection is provided, fire flow demands. The Water System does not have sufficient storage to meet both of these requirements. The Water System currently has approximately 58,000 gallons of storage. This volume satisfies the ADD of approximately 39,000gpm (past 12 month average); however, there is insufficient volume to adequately meet fire flow demands. Fire flow is defined as the capability to provide water at a minimum rate of 500 gallons per minute for at least 2 hours, while maintaining a minimum of 20 pounds per square inch (psi) of water pressure to all connections on the distribution system. This volume is above and beyond the ADD of the system. Additional storage must be constructed, or the fire hydrants that are currently on the distribution system must be removed. This has been identified in previous surveys. An adequate short-term resolution to the deficiency has already been undertaken by the Water System; that being an understanding between the Water System and the local fire department specifying that the hydrants are not to be used and instituting control so the fire hydrant are not used. While these solutions are adequate for short term management controls, the long-term solution is to remove the hydrants and replace them with flushing hydrants in accordance with a Water System proposed schedule, which the Water System is to be provide to the division A permit to construct will need to be obtained from the division before construction can commence. Please contact Greg Bostock of the division at 802-241-3407 (direct line) or 800-823-6500 (toll-free in-state) to determine the needs for a Permit to Construct and further discuss any other engineering improvements to the Water System. **The Water System's is required to address this deficiency by submitting a schedule to the division for the installation of additional storage by February 15th 2011.**

2. *Inadequate Storage Facility Alarms:* In accordance with the Vermont WSR, Chapter 21, Appendix A, Part 7, all Public Community Water System storage tanks must have a low water level alarm and level controls. The Water System does not have low water level alarms for the storage tanks. At a minimum, a low water-level alarm must be installed for these tanks; a high water-level alarm is recommended for the tanks. The Water System has attempted to install a pressure transducer in the main line with an automatic dialer to alert the operator of low water in the tank. The equipment the Water System has chosen has not worked. We discussed this option during the survey and the division has found that other water system, which has assessed this solution, has found it does not work well since pressure is also associated with flow in the pipe. The Water System need to find a solution with sensors and a means to alert the operator of low water levels at the tank. **The Water System is required to correct this deficiency by <u>May 15th 2010</u>.**

The following items are for your consideration and comments.

3. *Inoperable Meter:* In accordance with the Vermont WSR, Chapter 21, Appendix A, Part 2, all water supplies shall have an acceptable means of metering the finished water. The water system was permitted, based on designed submitted by the Water System, to install a master meter at the end of the source transmission line. This item has been a permit condition for several Operating Permits, which has not been resolved. The issue with the Division has been: this meter has not worked as it was designed and approved. This meter was designed; so that, with the water data acquired from it along meter water data leaving the Spring box/storage tank along with metered overflow from the Springs, would allow the Water System to gather accurate supply and demand information (see item #4 below). As part of the survey I assess the monthly water use data and have found that the monthly water use appears to adequately represent the demand expected for this size of a Water System and the type of water users on the system. The Division finds the needs for this meter may not be warranted anymore; however, we still recommend a appropriate meter be installed or modification be made to the existing meter.

4. *Source Yield/System Demand:* In accordance with the Vermont WSR, Subchapter 21-7, a Public Water System shall provide an adequate supply of potable water during average and peak user demand periods on a sustained basis to all users. The Water System TPO, Section II – Findings and Conclusions, Part B, item 2.h) states: *The Water System is not Permitted to add new service connections or expand existing water demand requirements without first demonstrating reserve capacity as prescribed under Appendix A, Part 2 of the WSR and Section !V, Item 2 of this permit.* This item is tied to item #3, above as a means to demonstrate supply verses demand. As part of the survey I assess the monthly reports and found that the Water System had gathered water use data and overflow data for about two years from 2005 to 2007. The date should be evaluated by your consulting engineer or hydrogeologist to evaluate what the spring sources can consistently produce. This evaluation along with the addition of expanded storage capacity may be able to remove the permit finding to not expand the water system. Please make this proposal to Rodney Pingree, Water Resource Section Chief, of the division. If you have any question please contact Rodney at 802-241-3418 (direct line) or 800-823-6500 (toll-free in-state).

5. *Storage Overflow:* The Water System hydraulics is such that water free flows from the springs into the storage tank and when distribution demands are satisfied the tank overflow onto the ground. The Water System does not apply chlorine on a full time basis; but as part of routine maintenance, the Water System disinfects the storage tank and distribution system. During this

maintenance a chlorinated overflow occurs. As discussed during the survey this overflow should be de-chlorinated and a simple flow through vessel containing de-chlorination tablets should be constructed. The Water System should contact the Wastewater Management Division of the Department of Environmental Conservation at (802) 241-3822 on whether a discharge permit is needed.

6. *Monthly Reporting Inadequate:* In accordance with the Vermont WSR, Subchapter 21-9, Public Water Systems providing treatment and all Public Community Water Systems must submit a signed report to the Secretary at least once per month no later than ten (10) days following the end of the month that details the total amount of water produced for the Water System that month and the daily residual chemical concentration entering the distribution system. The Water System TPO, Section IV – Special Conditions, Part C, item 1, states: *The Water System must record the daily chlorine disinfection residual entering the distribution system and the daily total amount of water produced on the monthly reporting forms. If no chlorine disinfection treatment is provided, the Water System must indicate that no treatment was applied. The first complete monthly operation report (which will represent the remainder of the March 2010 reporting period) is due by April 10, 2010.* A review of the past 12 months of reports found that the month of July is the only month where chlorine was added to the water system. The division would like to remind the Water System that monthly reporting that includes accurate free and/or total chlorine residuals along with water production is a requirement of a Public Water System Permit to Operate.

The Water System is to provide a written response to the items listed above in no less than 30 days, or by February 15th 2011. The written response is to indicate that the compliance dates above are acceptable or provide a detailed alternative schedule for review and approval. All identified system deficiencies shall be corrected within 120 days of the date of this notification letter or in accordance with an alternate schedule that has been approved by the Division. The approved compliance dates will be incorporated into a Temporary Permit to Operate or other compliance improvements schedule developed and implemented by the Agency. Please refer to the WSR, Subchapter 21-4, to determine if the required improvements noted above, require a Permit to Construct from the Secretary.

I appreciate Dean's time while conducting the sanitary survey of the Crystal Springs Water System. If you have any questions or would like to discuss anything on the survey please contact me at the address above, 800-823-6500 (in State), (802) 241-3412 (direct line), or email rob.farley@state.vt.us.

Sincerely

Robert G. Farley,
Hydrogeologist/ Systems Specialist

CC. Tim Raymond, System Operations Manager, WSD
Julie Hackbarth, Compliance and Certification Supervisor, WSD
Greg Bostock, Division Engineer, WSD
Rodney Pingree, Water Resource Section Chief, WSD
Ashley Lucht, Capacity Specialist, WSD
WSID File #5264

Aldrich + Elliott
WATER RESOURCE ENGINEERS

APPENDIX D

CRYSTAL SPRINGS WATER COMPANY, INC. ANNUAL REPORTS

STATE OF VERMONT
DEPARTMENT OF PUBLIC SERVICE
MONTPELIER, VERMONT

802-828-2811

vtdps@state.vt.us

VERMONT WATER COMPANY

ANNUAL REPORT

OF

Crystal Springs Water Co

96 Terrace St | Montpelier, VT

(If name was changed during the year, enter the previous name and date of change below)

f/k/a <Enter Previous Company Name>

Date of Change <Enter Date>

FOR THE YEAR ENDED DECEMBER 31, 2011
(Year)

FEDERAL TAX ID# 03-0218225

Officer or other person to whom correspondence should be addressed regarding this report:

Name	DEANE HEWES
Title	President
Address	96 Terrace St Montpelier, VT
Phone Number	802 223-5020
Email Address	

This annual report is due at the Department of Public Service and the Public Service Board no later than April 15th of each year. Neglect or refusal to file and pay gross revenue tax will result in penalties.

ANNUAL REPORT
TABLE OF CONTENTS

COMPUTATION OF GROSS REVENUE TAX — Year ended December 31,

VERMONT WATER COMPANY

COMPUTATION OF GROSS REVENUE TAX
(In accordance with 30 V.S.A., Section 22)

1 Gross Operating Revenue as recorded in your system of accounts from the conduct of business in Vermont for the year ended December 31, 57,243-

2 Deductions (Enter as Positive Number)

If any portion of the amount of Gross Operating Revenue reported in Line Item #1 above was not received from the conduct of business in Vermont such portion is not taxable and may be deducted. If deducted the amount of the deduction should be detailed below together with a detailed explanation as to how the deduction was computed.

Adjustment Description	Adjustment Amount

3 Total Deductions -0-

4 Gross Operating Revenue subject to tax (subtract Item 3 from Item 1) 57,243-

5 Tax Due: 001 per dollar of total amount of Item #4 of $5.00 which ever is greater. 57.24

Gross Operating Revenue Tax and Annual report forms are due at the DEPARTMENT OF PUBLIC SERVICE on or before APRIL 15 of each calendar year. Checks should be made payable to: TREASURER, STATE OF VERMONT, mailing address: STATE OF VERMONT, DEPARTMENT OF PUBLIC SERVICE, 112 STATE STREET, MONTPELIER, VT. 05620-2601

For Department use only:
Date Received: 4/11/12
By: _____

Amount Received: $57.24
Check Number 3859

GENERAL RULES FOR REPORTING

1. Items of contrary or opposite natures (such as decreases in column providing for net increases) should be shown in parenthesis.

2. Where information called for herein is not given, state full the reason for its omission. If the answer to any query is "none" or "not applicable", so state.

3. If it is necessary or desirable to show additional statements for purposes of clarification, they should be made on the same size paper. Each insert should bear the number and title of the schedule to which it pertains along with company name and year end.

4. Be sure that the report is sworn to by an officer having charge of the accounts, records and memoranda of the respondent, and, if a corporation, be the President, Treasurer, or the General Manager.

5. Pursuant to 30 V.S.A. § 22, every company subject to the supervision of the Department of Public Service and the Public Service Board must file a completed Annual Report Form each year with the Department. The Annual Report Form is to be filed in hard copy and electronically and sent to addresses below on or before April 15th of each year. Gross Revenue Tax payment checks should be made payable to **the Treasurer, State of Vermont.**

   File original hard copy report to:
   Original attestation signature & Gross Rev Tax Check to:
   Vermont Department of Public Service
   112 State Street
   Montpelier, Vermont 05620-2601

   Excel spreadsheet electronically to:
   vtdps@state.vt.us

   Copy to:
   Vermont Public Service Board
   112 State Street 4th Floor
   Montpelier, Vermont 05620-2701
   psb.clerk@state.vt.us

6. **DO NOT SEND HARD COPIES VIA "CERTIFIED MAIL OR REGISTERED MAIL."**

7. **If an extension of time is needed to file your Annual Report forms, it should be requested in writing to the Department, no later than March 30th. The extension may be granted · DO NOT SEND CERTIFIED MAIL allowed for the Gross Revenue Tax. An actual or estimated tax must be filed no later than April 15th.**

8. If an Annual Report is not filed within the time granted, the Department of Public Service, pursuant to Title 30, Section 26, will begin calculations of penalties.

   "When such annual report for any year is not rendered to the department of public service and the tax due thereon is not paid on or before April 15 next following, there shall be added to the tax an additional amount equal to five percent thereof or $1.00, whichever is greater, if such return is made and tax paid with fifteen days after becoming due, and twenty-five percent of the tax or $10.00, whichever is greater, if such return is not made and tax paid with fifteen days after becoming due. When a company, which has failed to file such return or has filed an incorrect or insufficient return and has been notified by the department of its delinquency, refuses or neglects within twenty days after such notice to file a proper return, or files a fraudulent return, the department shall determine the tax due according to its best information and belief and shall increase the amount of tax so determined by fifty percent or $20.00, whichever is greater. No assessment shall be made under this section unless made with two year from the date on which a correct return should have been filed but the limitation of two years to the assessment of such tax or additional tax shall not apply to the assessment of additional taxes upon fraudulent returns. In its discretion, the department may waive the penalties mentioned in this section, if it is satisfied that the default was for any justifiable cause, and it may extend the time for filing returns or paying such tax, not to exceed two months. (Amended 1959, No. 329 (adj. Sess.), § 39(b), eff. March 1, 1961; 1979, No. 204 (Adj. Sess.), § 12, eff. Feb. 1, 1981.)"

9. Wire transfers can be sent by obtaining pre-approval from the Department of Public Service.

PLEASE PROVIDE THE FOLLOWING INFORMATION - Use a separate sheet of paper if necessary

10. Report any corporate changes such as asset sales, stock transfers or mergers.
    According to 30 VSA Section 107, no company shall directly or indirectly acquire a controlling interest in any company without Public Service Board Approval.

11. Update consumer complaint contact person and telephone number.

12. Note: If your company doesn't intend to do business in the State of Vermont now or in the future please notify the Public Service Board so your Certificate of Public Good (CPG) can be revoked.
    As long as a company has a CPG in Vermont the Gross Revenue Tax and an Annual Report are due.

Condensed Balance Sheet & Income Statement — **Year ended December 31,**

CONDENSED BALANCE SHEET

		Amount
	ASSETS	
1.	Utility Plant in Service	781,307-
2.	*Less: Accumulated Depreciation*	326,574-
3.	Contributions	-0-
4.	Net Plant	454,733-
5.	Other	12,755
	Total	467,488-
	LIABILITIES	
6.	Capital	18721
7.	Long Term Debt	485,585
8.	Other	< 30,818>
	Total	467,488
	CONDENSED INCOME STATEMENT	
9.	Operating Revenues	57,243-
	OPERATING EXPENSES	
	PLANT OPERATION & MAINTENANCE	
10.	Salaries	3500-
11.	Purchased Water	719-
12.	Power for Pumping	218-
13.	Repairs	17,113-
14.	Depreciation Expense	18,187-
15.	Other TRAVEL + TESTING + SUPPLIES	4,291-
16.	Sub-Total	44,026-
	GENERAL EXPENSES	
17.	Salaries	
18.	Office Expenses	1010-
19.	Insurance	850-
20.	Legal/Accounting + ENGINEER	5400.-
21.	Other INTEREST	14,000-
22.	Sub-Total	21,300-
	DEPRECIATION EXPENSE - TAXES	
23.	Federal/State	250-
24.	Property	8201-
25.	Gross Revenue	66-
26.	Sub-Total	8517-
27.	Total Expenses	76,843
28.	Total Net Income *(line 9 minus Line 27)*	< 19600> LOSS

DEPRECIATION SCHEDULE

(use additional sheet if necessary)

Description of Utility Plant *(see Line 1)*	Life/Rate	Accumulated Depreciation *(see Line 2)*	Depreciation Expense *(see Line 14)*
781,307-	2.5%	326,574-	18,187-

Confidential Statement **Year ended December 31,**

By law, all documents filed with the Vermont Department of Public Service are considered public records available for inspection by the public unless a document qualifies for exemption under 1 V.S.A. § 317. To the extent consistent with its statutory obligations, it is the general policy of the Department not to release for inspection information contained in an annual report filed under 30 V.S.A §22 which the Department has provisionally determined may qualify for exemption from disclosure under 1 V.S.A. §317. To that end, the Department will accept annual reports for filing that have been redacted by the filing utility to protect competitively sensitive information from public disclosure.

A utility may request confidential treatment of its annual report by simultaneously filing with its (non redacted) report (1) a written request for confidential treatment; (2) a redacted version of the report; and (3) an affidavit executed under oath by a duly authorized official of the utility specifying and explaining for each redacted item the grounds and legal authority it is relying upon in requesting such confidential treatment. Annual reports for which confidential treatment has been requested must be clearly and conspicuously marked as "confidential" on the title page and on all subsequent pages containing the information which the filing utility has designated for confidential treatment in the redacted version of the report.

Upon receiving a request for access to a redacted portion of an annual report, the Department will review the appropriateness of the utility's "confidential" designation and may determine to nonetheless release the requested information. Consistent with its statutory obligations, the Department will make reasonable efforts to provide the utility that filed the redacted annual report with advance notice of the Department's decision to release information that the utility designated as "confidential."

Water Company Information — Year ended December 31,

WATER COMPANY INFORMATION

CATEGORY	# OF CUSTOMERS	REVENUE
Residential		
Metered		
Rates per cubic feet or per 1000 gallons		
Unmetered	97 x 41.09	4 5 8.56 -
Commercial	18 x 66.78	14,424 -
Schools		
Hydrants		
Other (Please specify)	7 nos.	4776 -
	TOTAL	69056

RATE STRUCTURE: (state if monthly, quarterly or annual and if payable in advance or in arrears)

OTHER CHARGES:

Bi-Monthly in the arrears
Service Call 35.00
Late Fee - 10%

SIGNATURE PAGE **Year ended December 31,**

Annual Report to
STATE OF VERMONT
DEPARTMENT OF PUBLIC SERVICE
For the Year Ended December 31,

I certify that I am the responsible accounting officer of

Crystal Springs Water Co

that I have examined the foregoing report; that to the best of my knowledge, information, and belief, all statements of fact contained in the said report are true and the said report is a correct statement of the business and affairs of the above named respondent in respect to each and every matter set forth therein during the period from January 1, , to December 31, , inclusive,

Signature:	Diane F Hedges
Printed Name:	DIANE HEDGES
Title:	President
Date:	April 9, 2012

Persons making willful false statements in this report form can be punished by fine or imprisonment under the provisions of the US Code, Title 18 Section 1001.

EMAIL ADDRESSES FOR THE VERMONT DEPARTMENT OF PUBLIC SERVICE ANNUAL REPORT FILINGS

In order to contact our regulated companies via email the Department of Public Service needs reliable email and website addresses. If your email or website addresses change, please notify us.

Do you have Internet access? yes/no

Company full name: _____

First contact email address: _____

Second contact email address: _____

Website address: _____

Date: _____

Aldrich + Elliott
WATER RESOURCE ENGINEERS

APPENDIX E

CRYSTAL SPRINGS SOURCE REVIEW

Hoffer Consulting Inc.

Memo

To: Joe Duncan, P.E., Aldrich + Elliott.

From: Jeff Hoffer , Hoffer Consulting Inc.

Date: May 30, 2013

Re: Source Review, Water System Evaluation, Crystal Springs/East Montpelier Fire District #1, East Montpelier, Vermont

---

Hoffer Consulting Inc. (HCI) is pleased to offer this review of existing and potential future water sources for the Crystal Springs Water System in East Montpelier, Vermont. We understand that the East Montpelier Fire District #1 is negotiating the take over/purchase of the water system from the Hedges family, and that Aldrich + Elliott (A+E) is assisting the fire district with their evaluation of the water system.

HCI's original scope included a review of state files and a site visit. Flooding of the VTDEC Water Supply Division (WSD) during Hurricane Irene has reportedly destroyed many of the WSD's files. As a result, this review did not include a review of WSD files. Available information included existing HCI files (from historical work conducted for Crystal Springs) and recent correspondence & permits provided by A+E. No site visit was conducted as part of HCI's review.

Figures 1 and 2 show the location of the Crystal Springs Water System sources and their Source Protection Areas.

The water system relies on gravity-flow springs to provide water to approximately 300 customers in East Montpelier. The water system's most recent Temporary Permit to Operate (TOP)[1] recognizes three permitted sources (Spring #1, Spring #2, and Spring #4), with a combined permitted yield of 50 gpm. The TOP identifies an average daily usage of 23,442 gallons per minute (gpm) and a maximum day usage of approximately 45,000. The TOP also indicates the water system is not permitted to add new connections without first demonstrating reserve capacity. WSD correspondence[2] identifies metered usage and spring overflow data from 2005 to 2007, although I have not seen or reviewed this data. This data could be used to quantify the reserve capacity as per VT Water Supply Rule requirements. The WSR rule takes a very conservative approach in assigning "safe yields" to springs. Even if such an analysis determines there is excess capacity available for additional connections, it may be worthwhile for the Fire District to consider developing additional sources.

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[1] Public Water System Temporary Permit to Operate, March 26, 2010, VTDEC Water Supply Division,
[2] Sanitary Survey Letter from Robert G. Farley, VTDEC Water Supply Division, April 27, 2011.

It is my understanding that the Crystal Springs Water System has taken numerous steps to increase the source capacity of the system, including the drilling of wells. Well #1 is a gravel well located on the eastern side of the water system, and was known to have elevated iron and/or manganese. Well #2 and Well #3 are bedrock wells that were drilled in the vicinity of the existing springs in the early 1990s. These wells were not taken through the WSD's permitting process, and the WSD required the water system to abandon (seal) these wells. The two drilled bedrock wells showed very high yields (see enclosed well logs) and similar water quality as the springs (see enclosed Table 1).

Historical water quality data that I have reviewed indicates compliance with drinking water standards. The three springs also passed Microscopic Particulate Analysis (MPA) testing, indicating the springs are not under the direct influence of surface water. Source protection plans have identified potential sources of contamination in the recharge area to the springs, such as agricultural activities. None of the existing land uses in the Source Protection Areas appear to pose significant risks to groundwater quality.

Several options have been considered to expand the system's source capacity, including; 1) the development of wells on the eastern side of water system distribution system, or 2) development of wells in the vicinity of the springs. The first option has several obstacles including finding available land that can meet siting and setback requirements, and also finding suitable hydrogeologic conditions to permit the development of a well or wells. For the second option, the only drawback is the lack of electricity at the site of the springs. The second option is more favorable from a hydrogeologic standpoint, since we know the two wells drilled near the springs had high yields. It is safe to assume that future wells drilled near the springs are likely to provide significant water, on the order of > 50 gpm.

The attached Table 2 presents cost estimates to develop a bedrock well to serve a public community water system. I use a rough estimate of $50,000 to $100,000 with a schedule of completion of 6 to 12 months.

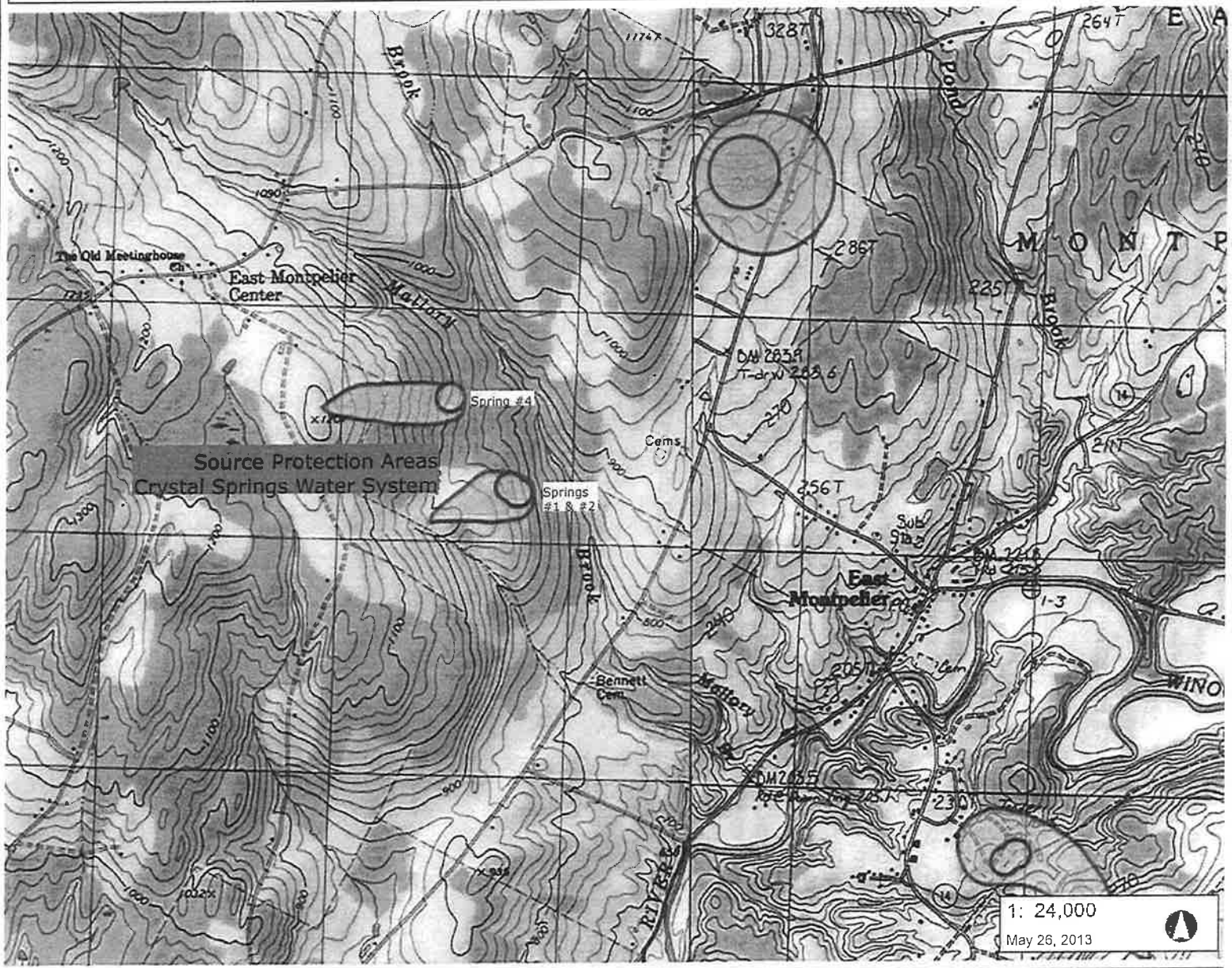
If you have any questions, please e-mail me (jeffhoffer@charter.net) or call me at 802-626-3077.

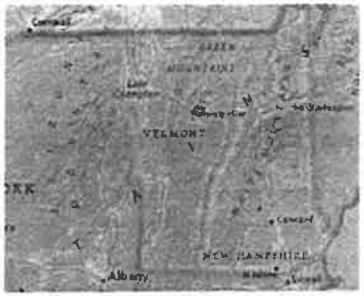
VERMONT

Vermont Agency of Natural Resources

Vermont Agency of Natural Resources

vermont.gov





LEGEND

GroundWaterSPA

- ACTIVE
- PROPOSED

Town Boundary

Light Gray Canvas Base

FIGURE 1
Source Protection Areas
Crystal Springs
Water System
East Montpelier, VT

NOTES

Map created using ANR's Natural Resources Atlas

4,000.0 0 2,000.00 4,000.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2000 Ft. 1cm = 240 Meters

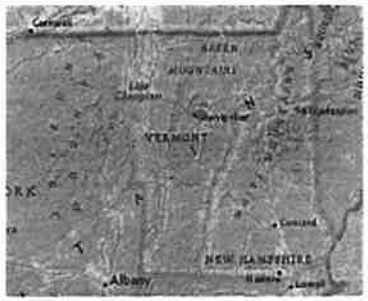
THIS MAP IS NOT TO BE USED FOR NAVIGATION

VERMONT

Vermont Agency of Natural Resources

Vermont Agency of Natural Resources

vermont.gov



LEGEND

GroundWaterSPA

- ACTIVE
- PROPOSED

Town Boundary

FIGURE 2
Source Protection Areas
Crystal Springs
Water System
East Montpelier, VT

NOTES

Map created using ANR's Natural Resources Atlas

1,667.0 0 834.00 1,667.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 833 Ft. 1cm = 100 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION

TABLE 1

Inorganic and Radionuclide Testing Results,
Crystal Springs Water System, East Montpelier, Vermont.

Inorganics	MCL	Well #2 (lower) on 12/6/92	Well #3 Sampled on 8/16/92	Well #3 Sampled on 12/6/92	System Sampled on 2/2/93	System Sampled on 5/3/94	Berns House Sampled on 4/11/91
Arsenic	0.05 mg/L	<0.002		<0.006		<0.006	<0.006
Barium	1.0 mg/L	<0.01		<0.01		<0.01	<0.1
Cadmium	0.005 mg/L	<0.0001		<0.002		<0.002	<0.002
Chromium	0.1 mg/L	<0.0005		<0.005		<0.005	
Copper	1.3 mg/L	0.014	<0.020	<0.05			<0.1
Fluoride	4.0 mg/L	<0.1		<0.2		0.07	<0.2
Lead	0.015 mg/L	0.005		<0.005			<0.005
Mercury	0.002 mg/L	<0.0002		<0.0005		<0.0005	<0.0002
Nitrate	10.0 mg/L as N	0.33	0.962	0.9	1.8	0.8	<1.2
Selenium	0.05 mg/L	<0.003		<0.005		<0.005	
Turbidity	0.3 NTU	0.3	2.0	0		<0.1	<0.1
	SMCL						
Iron	0.3 mg/L	0.06	0.045	<0.05			<0.1
Manganese	0.05 mg/L	0.0029	<0.025	<0.005			<0.05
Odor	3 T.O.N.	undetected		undetected			
Sulfate	250.0 mg/L	17		12			
Chloride	250 mg/L	8	1.0	<5			<15
Color	15 C.U.	<5	0/ND	<5.0			
Foaming Agents	0.5 mg/L	<0.1		<0.1			
Zinc	5.0 mg/L	<0.05		<0.05			<0.5
Silver	0.1 mg/L	<0.0005		<0.005			
Sodium	250 mg/L	<5	13.3	<2			<5
pH	6.5 - 8.5 su	7.80	7.90	7.5			7.7
Total Dissolved Solids	500.0 mg/L	172		172			
Langelier	non-corrosive	-0.41		-0.58			
Alkalinity	-	120		119			
Ca as CaCO3	-	90		120			
Calcium	-		47.8				
Magnesium	-		2.08				
Hardness	-		127.9				147
Radionuclides	MCL						
Gross Alpha	15 pCi/L	<2.5		<2.41		<1.14	
Gross Beta	50 pCi/L	<1.68		1.9		<2.3	

TABLE 2

Outline for Developing a Public Community Groundwater Source in Vermont*.
(BEDROCK SOURCE)

		COST RANGE low	COST RANGE high	EST. DURATION (weeks) low	EST. DURATION (weeks) high
A)	**Technical Evaluation of Groundwater Availability**			2	4
	Preliminary Site Visit	$0	$500		
	Review of Existing Data	$1,200	$5,000		
	Identification of Study Area Boundaries				
	Collection/Review of Available Maps & Reports				
	Tabulation/Analysis of Well Log Data				
	Development of Exploration Program (Target Aquifer)				
B)	**Well Site Selection**			2	4
	Bedrock Wells				
	Field Geologic Mapping/Fracture Characterization	$1,000	$1,500		
	Fracture-Trace Mapping	$1,500	$3,000		
	Borehole Video Surveys of Existing Wells	$600	$1,200		
	Surface Geophysical Surveys	$2,500	$20,000		
	Evaluation of Potential Sources of Contamination	$250	$500		
	Identification and Ranking of Test Well Drilling Sites	$250	$500		
C)	**Regulatory Approval - Site Approval**			6	12
	Submit Source Approval Application to Begin State Review ($945 State Fee)	$1,200	$1,500		
	Site Visit With State Personnel	$300	$500		
	Public Notice for New Source (30-Day Notice)	$0	$0		
	Receive State Approval for Source Construction	$0	$0		
D)	**Construct Well (s)**			6	8
	Drilling can proceed as either "test wells" or production well constructed to State Standards (6-inch bedrock well, grouted, 500 feet, $12,500/well)	$12,500	$25,000		
E)	**Regulatory Approval - Source Testing Approval**			12	24
	Submit Source Testing Form to State	$500	$1,000		
	Receive State Approval for Source Testing				
	Source Testing (duration of pumping test and monitor radius depends upon well yield)	$15,000	$25,000		
	Water Quality Testing ($2000/source)	$2,000	$4,000		
	MPA Testing (one of two required rounds, if needed)	$500	$1,000		
	Source Evaluation Report	$5,000	$7,500		
	WHPA Delineation/Source Protection Plan	$1,200	$4,800		
	WHPA Public Notice	$0	$0		
	Source Protection Plan	$3,000	$5,000		
		low	*high*		
	TOTAL for bedrock wells, no geophysical surveys	**$43,000**	**$82,500**		
	TOTAL for bedrock wells, with geophysical surveys	**$48,500**	**$107,500**		
	ESTIMATED PROJECT DURATION (weeks)			28	52
	(months)			6	12

cost ranges based on different number of wells, land area, etc.

*** does not include land purchases, road building, engineering costs**

CS Well #2

WELL NO. / TAG NO. _____ (For Grantee's Use)

This report must be completed and submitted to the Department of Environmental Conservation, 103 South Main Street (10N), Waterbury, VT 05676 no later than 60 days after completion of the well.

State of Vermont
Dept. of Environmental Conservation
103 South Main Street (10N)
Waterbury, Vt. 05676

WELL COMPLETION REPORT

DEPARTMENT USE ONLY

E.C. _____ U.S.G.S. _____
Field Location ☐ Map area _____
Latitude _____ ° ' " Elev. _____
Longitude _____ ° ' " Topo. _____
Scale: 62,500 ☐, 25,000 ☐, 24,000 ☐
Location map attached to WCR _____ Data in Town Files ☐ _____

1 WELL OWNER Dean Hedges
Name — Permanent Mailing Address
OR
WELL PURCHASER Same
Name — Permanent Mailing Address

2. LOCATION OF WELL. TOWN E. Montpelier SUBDIVISION _____ LOT NO. _____

3 DATE WELL WAS COMPLETED Aug. 28, 92

4. PROPOSED USE OF WELL: ☐ Domestic. ☐ Other _____

5. REASON FOR DRILLING WELL: ☑ New Supply. ☐ Replace Existing Supply. ☐ Deepen Existing Well. ☐ Test or Exploration. ☐ Provide Additional Supply. ☐ Other _____

6. DRILLING EQUIPMENT: ☐ Cable Tool. ☑ Rotary with A-P. ☐ Other _____

7 TYPE OF WELL: ☑ Open Hole in Bedrock. ☐ Open End Casing. ☐ Screened or Slotted. ☐ Other _____

8 TOTAL DEPTH OF WELL: 398 feet — feet below land surface

9. CASING FINISH: ☑ Above ground, Finished. ☐ Above ground, Unfinished. ☐ Buried. ☐ In Pit. ☐ Removed. ☐ None used. ☐ Other _____

10. CASING DETAILS: Total length 21 ft. Length below L.S. 6 ft. Dia. 6 in. Material Steel Wt. 19 lb./ft.

11. LINER OR INNER CASING DETAILS: Length used 107'2" ft. Diameter 4 in. Material Steel Weight _____ lb./ft.

12. METHOD OF SEALING CASING TO BEDROCK: ☑ Drive Shoe. ☑ Cement - type neat cement. Drilled _____ in. into _____ ft. of Bedrock. ☐ Other _____

13. SCREEN DETAILS: Make and Type _____ Material _____ Length _____ ft. Diameter _____ Slot Size _____. Depth to top of screen in feet below land surface _____ ft. Gravel pack if used. Gravel Size or Type _____

14. YIELD TEST: ☐ Bailed. ☐ Pumped. ☑ Compressed Air, for 4 hours at 100+ Estimated gallons per minute. Measured by: ☑ Driller. ☐ Orifice pipe. ☐ Weir. ☐ Meter. ☐ Permanent Airline used.

15 STATIC WATER LEVEL: _____ feet below land surface. Date or Time measured _____. Gravity flow at _____ G.P.M.

16 WATER ANALYSIS: Has the water been analyzed? ☐ Yes ☐ No. If Yes, Where _____

17. SPECIAL NOTES: _____

18. WELL LOG

Depth from Land Surface: Feet	Feet	Water Bearing	Formation Description	Depth
Ground Surface	14		Hardpan	
14	22		Brown Bedrock with Clay	
22	81		Gray Shale	
81	398		Gray - Changing light to gray	

19. SITE MAP
Show the nearest structures such as buildings, septic tanks, and the other land marks and indicate and type them for distances to the well indicate local street name and subdivision lot number

20. TESTED YIELD
If the yield was tested at different depths during drilling, list below

Feet	Gallons Per Minute
22'30'44	Sealed off
82'110'114'	
149'154' 247	last 90

WELL DRILLED BY: H.A. Manosh Corp

DOING BUSINESS AS: _____ Company or Business Name

REPORT FILED BY: _____ Authorized Signature

9/22/92

8

Well #2

WELL OWNER Dean Hedges, Crystal Springs Water Co.
Name Mailing Address

WELL DRILLER H.A. Manosh Corp. Monroeville
Name Mailing Address

PROPOSED USE OR USES: (Check):
☐ Domestic ☐ Agriculture ☐ Business Establishment ☑ Municipal ☐ Industrial
☐ Other (Specify use):

	CASING DETAILS (Inside)	YIELD TEST	WATER LEVEL (From land surface if possible)
☑ New Well ☑ Replacement Well ☐ Set-Over Existing Well	Length: 21 Feet Diameter: 6 Inches Kind: Steel Weight: 19 lbs./p/ft. ☑ New ☐ Used	☐ Bailed or ☐ Pumped or ☑ Compressed Air 3 Hours 100+ GPM Yield: 100+ GPM	Static _____ Feet During Yield Test: _____ Feet DRILLING EQUIPMENT ☐ Cable Tool ☐ Rotary ☑ Air Percussion ☐ Other (Specify)

TOTAL DEPTH OF WELL 398 FEET TOWN WELL IS LOCATED IN:
(Make sketch of well location on reverse side of sheet.)

— WELL LOG —

Depth From Ground Surface	Give description of formations penetrated, such as peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example; 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.	
0 ft. to 14 ft.	Hardpan	107' 2" – 4" steel
14 ft. to 22 ft.	bedrock with clay	pipe and seal
22 ft. to 81 ft.	gray shale	water at 22', 30',
81 ft. to 123 ft.	light gray	44', 87', 110', 114'
123 ft. to 398 ft.	light & dark gray	189', 250', 307'

DATE WELL STARTED 8/26/92 DATE WELL COMPLETED 8/28/92 sealed

Bits Used # _____ Footage _____ Daily Footage _____
_____ _____
_____ _____
_____ _____
8" Bit _____ _____

DRILLER'S HOURS _____ HELPER'S HOURS _____

NEWS & CITIZEN, INC.

CS well #3

WELL NO. / TAG NO. _____

(For Division's Use)

This report must be completed and submitted to the Department of Environmental Conservation within 30 days of the completion of the well.

State of Vermont
Dept. of Environmental Conservation
103 South Main Street (10N)
Waterbury, Vt. 05676

WELL COMPLETION REPORT

DEPARTMENT USE ONLY
E.C. _____ U.S.G.S. _____
Field Location ☐ Map area _____
Latitude _____ ° ' " Elev. _____
Longitude _____ ° ' " Topo. _____
Scale: 62,500 ☐, 25,000 ☐, 24,000 ☐
Location map attached to WCR _____ Data in Town Files ☐ _____

1. WELL OWNER Dean Hodges
   (Name) (Permanent Mailing Address)
   OR
   WELL PURCHASER Same
   (Name) (Permanent Mailing Address)
2. LOCATION OF WELL: TOWN E. Montpelier SUBDIVISION _____ LOT NO. _____
3. DATE WELL WAS COMPLETED Aug 31, 92
4. PROPOSED USE OF WELL: ☐ Domestic, ☐ Other _____
5. REASON FOR DRILLING WELL: ☑ New Supply, ☐ Replace Existing Supply, ☐ Deepen Existing Well, ☐ Test or Exploration, ☐ Provide Additional Supply, ☐ Other _____
6. DRILLING EQUIPMENT: ☐ Cable Tool, ☑ Rotary with A-P, ☐ Other _____
7. TYPE OF WELL: ☑ Open Hole in Bedrock, ☐ Open End Casing, ☐ Screened or Slotted, ☐ Other _____
8. TOTAL DEPTH OF WELL: 72' feet below land surface
9. CASING FINISH: ☑ Above ground, Finished, ☐ Above ground, Unfinished, ☐ Buried, ☐ In Pit, ☐ Removed, ☐ None used, ☐ Other _____
10. CASING DETAILS: Total length 32' ft Length below L.S. 12 ft Dia. 6" in. Diameter Steel wt. 19 lb./ft
11. LINER OR INNER CASING DETAILS: Length used _____ ft Diameter _____ in. Material _____ Weight _____ lb./ft
12. METHOD OF SEALING CASING TO BEDROCK: ☑ Drive Shoe, ☑ Grout - Type neat cement, Drilled _____ in. Date _____ ft. in Bedrock ☐ Other _____
13. SCREEN DETAILS: Make and Type _____ Material _____ Length _____ ft, Diameter _____ Slot Size _____, Depth to top of screen in feet below land surface _____ ft. Gravel pack if used, Gravel Size or Type _____
14. YIELD TEST: ☐ Bailed, ☐ Pumped, ☑ Compressed Air, for 4 Hours at 200 Gallons per minute Measured by ☐ Bucket, ☐ Orifice pipe, ☐ Weir, ☐ Meter ☐ Pumping water level _____
15. STATIC WATER LEVEL: _____ feet below land surface, Date of Time measured _____, Overflows at _____ GPM
16. WATER ANALYSIS: Was the water been analyzed? ☐ Yes ☐ No, If Yes, Where _____
17. SPECIAL NOTES: _____
18. WELL LOG

Depth from Land Surface Feet	Depth from Land Surface Feet	Water Bearing	Formation Description	Sketch
Ground Surface	10		Hardpan	
10	12		Boulder	
12	19		Brown rock and Clay	
19	47		gray bedrock	
47	72		Brown & gray	
			fractured rock at 47' & 69'	

19. SITE MAP
Show permanent structures such as buildings, septic tanks, and other fixed marks and indicate not less than two distances to the well from fixed corners and subdivision lot number

20. TESTED YIELD
If the yield was tested at different depths during drilling, list below

Feet	Gallons Per Minute
47' 52' 64'	
66' 69' 72'	

WELL DRILLED BY: H. A. Manosh Corp
DOING BUSINESS AS: _____ (Company or Business Name)
REPORT FILED BY: _____ (Authorized Signature)
9/22/92

8

Well #3

WELL OWNER Dean Hedges, Crystal Springs Water Co.
Name — Mailing Address

WELL DRILLER H. A. Manosh Corp — Morrisville
Name — Mailing Address

PROPOSED USE OR USES: (Check):
☐ Domestic ☐ Agriculture ☐ Business Establishment ☑ Municipal ☐ Industrial
☐ Other (Specify use):

	CASING DETAILS (Inside)	YIELD TEST	WATER LEVEL (From land surface if possible)
☑ New Well ☑ Replacement Well ☐ Set-Over Existing Well	Length: 32' Feet Diameter: 6 Inches Kind: Steel Weight: 19 lbs./p/ft. ☑ New ☐ Used	☐ Bailed or ☐ Pumped or ☑ Compressed Air 4 Hours 200 GPM Yield: 200 GPM	Static ____ Feet During Yield Test: ____ Feet DRILLING EQUIPMENT ☐ Cable Tool ☐ Rotary ☑ Air Percussion ☐ Other (Specify)

TOTAL DEPTH OF WELL 72' FEET TOWN WELL IS LOCATED IN:
(Make sketch of well location on reverse side of sheet.)

— WELL LOG —

Depth From Ground Surface	Give description of formations penetrated, such as peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example; 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.	
0 ft. to 10 ft.	Hardpan	Brown Water - Water
10 ft. to 12 ft.	boulder	47' 52' 64'
12 ft. to 19 ft.	Brown sand & clay	66' 69' 72'
19 ft. to 47 ft.	gray bed rock	Broken up rock
47 ft. to 72 ft.	Brown & gray bed rock	47' 69'

DATE WELL STARTED Aug 31 DATE WELL COMPLETED Aug 31

Bits Used #	Footage	Daily Footage
#		Casing was grouted into bed rock with Cement.
#		
#		
8" Bit		

DRILLER'S HOURS ____ HELPER'S HOURS ____

NEWS & CITIZEN, INC.