



CIVIL ENGINEERING ASSOCIATES, INC.

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May 7, 2015
Jeannine McCrumb
Town of Charlotte
P.O. Box 119
Charlotte, Vermont 05445

**Re: 823 Ferry Road –Coffee Wholesale Wastewater Review
Certificate of Compliance 4C0335-1**

Dear Jeannine,

From correspondence with Chris Galipeau of our office we have been requested to evaluate and review the quality of wastewater produced by a cold brewed coffee wholesale business, and its effect on the existing wastewater disposal system located at the 823 Ferry Road property in Charlotte, Vermont. Our review of the wastewater is limited to the cleaner and sanitizer products utilized by the owner in the daily operations.

Wastewater effluent quality is evaluated by multiple parameters such as biochemical oxygen demand (BOD₅), total suspended solids (TSS), fats, oil and grease (FOG), and pH. This analysis uses pH as the primary indicator of quality as this data is readily available for both cleaner and sanitizer. The primary cleaner to be used for cleansing of the brew vessels is PBR or One Step and the primary sanitizers to be used are Star San or Sani Clean. The material data safety sheets for each of these products is attached along with the proposed usage procedures as summarized by the owner.

With the dosage and frequency information provided, a pH analysis was performed. pH is a measure of the hydrogen concentration in water. Low pH indicates increasing acidity, whereas a high pH indicates increasing alkalinity. The acidity or alkalinity of wastewater affects both treatment and the environment. (Eliasson 2004) The pH of wastewater typically falls between 6.5 and 8 (Canter and Knox 2004) As a result it is critical that the pH of effluent entering the septic tank does not fall outside the normal range in order to maintain proper operation.

To evaluate the pH, an analysis by Five Star Chemicals Supply, Inc. was utilized. This analysis was prepared for a separate project but utilizes the same volume and type of cleaner and sanitizer. Due to the fact that the cleaners and sanitizers discussed are used within a short duration of each other, the attached analysis effectively combines the two products. The resulting pH ranged from 11.6 to 12.0 in the resulting solution depending on the amount of cleaner used in each batch. These values fall outside the acceptable pH range for septic tank effluent.

As a result, mitigation is recommended to preserve the function of the septic tank and leach field. In order to lower the pH to an acceptable range, we recommend adding sodium bisulfate to the wastewater stream. Sodium bisulfate is commonly referred to as a dry acid and is a dry granular product that can be safely shipped and stored. The procedure to reduce pH is as follows:

1. Combine and mix 5 gallons of waste cleaner solution and 5 gallons of waste sanitizer solution.
2. Add 1.6 oz of Sodium bisulfate(dry acid) and mix thoroughly.
3. Test combined and mixed wastewater sample using pH testing strips according to the manufacturers instructions. If pH is above 8.0 go to Step 4, if pH is below 6.5 see Step 5. If pH falls within the acceptable range of 6.5-8.0 proceed to Step 6.
4. Add 0.5 oz of additional dry acid and repeat Step 3 as necessary until pH is in the acceptable range of 6.5-8.0.
5. Add 0.5 oz of baking soda and repeat Step 3 as necessary until pH is in the acceptable range of 6.5-8.0.
6. Dispose of wastewater with pH ranging from 6.5-8.0 into septic system.

By adjusting the pH of the wastewater before entering the septic tank the waste strength will be similar to a typical wastewater disposal system. By not altering or performing these steps the waste stream entering the tank is potentially disruptive of the microorganism activey and will reduce effluent quality in the disposal field.

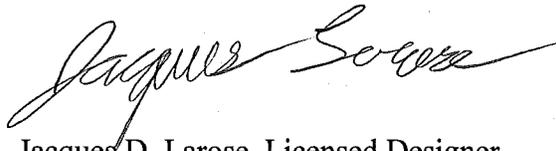
The procedures and findings desribed in this letter represent effluent quality and mitigation based upon the best available information and the identified operations.

This completes our review of the proposed coffee wholesale wastewater effluent as requested. If you should have any questions or need any additional information please feel free to contact me at dmarshall@cea-vt.com or 864-2323 x310.

Respectfully,



David S. Marshall, P.E.
Principal Engineer



Jacques D. Larose, Licensed Designer
Staff Engineer

Enclosures

Process and cleaner use in Ferry Rd commercial kitchen Space from Benjamin Lee
Correspondence from 5 Star Chemicals
MSDS Sheets for Cleaners and Sanitizers

cc: Catamount/Shelburne LLC. c/o Redstone
file, 15139

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References:

1. Eliasson, J. (2004). Septic Tank Effluent Values, Washington State Department of Health, Washington.
2. Canter, L.W. and R.C. Knox. 1985. Septic Tank Systems: Effect on Ground Water Quality. Lewis Publishers, Chelsea, MI. pp. 336.



**Vermont Department of Environmental Conservation
Drinking Water and Groundwater Protection Division**

Agency of Natural Resources

One National Life Drive - Main 2 [phone] 802-828-1535
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<http://dec.vermont.gov/water>

**PUBLIC WATER SYSTEM CONSTRUCTION PERMIT
Non-Transient Non-Community System**

PROJECT #C-3102-14.0 WSID #VT0020397 PIN # EJ14-0078

PERMITTEE: Jeff Kenyon
ADDRESS: 210 College Street, Suite 201
Burlington, VT 05401

PROJECT NAME: Catamount Charlotte Water System
TOWN LOCATION: Charlotte

A. General

This permit is issued under the authority 10 V.S.A., Chapter 56.

This permit is based on a review that determined that the proposed project, if built in accordance with the approved plans and specifications, will conform to design standards contained in the Vermont Water Supply Rules (Rules), and will therefore not constitute a public health hazard or a public health risk. The review did not, however, include the structural engineering aspects of this project.

B. Project Description

The project is the after-the-fact permitting of changes to the drinking water treatment system and improvements to the treatment and distribution systems. The installed treatment includes chlorine injection and contact tanks for hydrogen sulfide reduction, granular activated carbon filters, and a water softener. Proposed improvements to the water system include a metering pump for chlorine disinfection chemical addition, two (2) 350-gallon atmospheric storage tanks, a booster pump, and one (1) additional 86 gallon hydropneumatic pressure tank. There is no change in design demand associated with this project.

C. Standard Conditions

1. The project shall be constructed, tested, and inspected in accordance with this permit and the approved plans and specifications prepared by Ruggiano Engineering, Inc. listed below:

Sheet No.	Drawing Date	Last Revision Date
C-1	01/29/14	07/28/16
C-2	06/12/14	07/28/16

The total number of sheets reviewed by the Vermont Department of Environmental Conservation (Department) for this project is two (2).

2. All Construction on this project must be completed by July 31, 2018. If construction has not been completed by that date, this permit shall expire and a new permit must be obtained before construction can continue.
3. The permittee shall not initiate construction of any part of the water system authorized by this permit unless and until the permittee has obtained permanent legal access to all parts of the system authorized by this permit. For the purposes of this requirement, permanent legal access consists of an easement, right of way, deed or other legal document that creates an enforceable permanent property interest that provides access to the parts of the water system authorized by this permit for the purposes of construction, operation and maintenance of the system. A copy of the legal documents shall be submitted to the Department prior to the initiation of construction.
4. An inspection of the completed project shall be performed by a competent inspector under the general supervision of a registered professional engineer.
5. Prior to being placed in operation, the newly constructed portions of the Water System shall be flushed, pressure tested, disinfected and flushed again. After this procedure, at least two samples must be collected from representative sample points and sent to the Vermont Department of Health Laboratory at 359 South Park Dr., Colchester, VT 05446 (or any other Vermont Department of Health certified laboratory) for Bacteriological Examination of Public Water Supply. The Permittee shall indicate on the laboratory form that it is for construction permit compliance. Coliform Absent sample results are required before the system may be placed "on line" for potable water use. The pressure/leakage and bacteriological test results shall be submitted to the Department of Environmental Conservation along with the Record Drawings.
6. Record drawings shall be prepared by the professional engineering firm responsible for observation of construction and depict the system as it was constructed, including any field modifications. Record Drawings shall be dated, contain the engineer's Construction Certification, shall include the professional engineer's seal and signature, and shall be submitted to the Department and the Catamount Charlotte water system, WSID #VT0020397 within 60 days of final project field inspection and approval by the responsible professional engineer.
7. The following Construction Certification shall be prepared by the professional engineering firm responsible for observation of construction:
 - i. "I hereby certify that in the exercise of my reasonable professional judgment the installation-related information submitted is true and correct and that the components of the public water system authorized by the Public Water Supply Construction permit #C-3102-14.0:
 1. Were installed in accordance with:
 - a. The permitted design and all permit conditions; or
 - b. Record Drawings and such Record Drawings are in compliance with the applicable rule, were filed with the Secretary, and are in accordance with all other permit conditions;
 2. Were inspected;

3. Were properly tested; and
4. Have successfully met those performance tests.”

8. Until the construction authorized by this permit has been completed and the record drawings have been submitted, this permit is not transferable or assignable and it shall automatically become invalid upon a change of ownership or upon suspension or revocation.

9. An Operation and Maintenance (O&M) Manual is to be prepared in accordance with Subchapter 21-7 and Appendix D of the Water Supply Rule, Chapter 21, for the improvements authorized by this permit. A copy of the O&M Manual shall be provided to Jeff Kenyon for the Catamount Charlotte water system (WSID #VT0020397) and the Department for review and acceptance within 60 days of final project field inspection and approval by the responsible professional engineer.

10. A new or amended Construction Permit is required for all significant system improvements, or modifications for the Public water system pursuant to Subchapter 21-4, Section 4.0.1 of the Rules and shall conform to the Vermont Standards for Water System Design, Construction and Protection in Appendix A.

11. No changes shall be made to the permitted project without the written approval of the Department. Approvals of major modifications will require a permit amendment.

12. By acceptance of this permit, the Permittee agrees to allow representatives of the State of Vermont access to the project, at reasonable times, for the purpose of ascertaining compliance with Vermont environmental laws and this permit.

13. Enforcement. Pursuant to 10 V.S.A. Chapters 56, 201 and 211, any violation of the terms and conditions of this permit, including any compliance schedule, is grounds for the initiation of an enforcement action by the State against the Permittee.

14. This permit may be appealed to the Environmental Division of the Superior Court within 30 days of the date of the decision in accordance with 10 V.S.A. Chapter 220.

Signed at Montpelier, VT this 10th day of August, 2016

Alyssa B. Schuren, Commissioner
Department of Environmental Conservation

By Bryan J. Redmond
Bryan Redmond, Director
Drinking Water and Groundwater Protection Division

BMLK

cc: Zack Clark, Ruggiano Engineering, Inc
Tim Raymond, Rob Farley, Patrick Smart, Ray Solomon, Helen Banevicius, DWGWPD
Jessanne Wyman, William Zabiloski, Essex Regional Office, DWGWPD
WSID File #VT0020397