The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

AMENDED
WATER CONSERVATION PLAN APPROVAL

October 26, 2015

Acorn Terrace Cooperative, Inc.
c/o Richard Williams
P.O. Box 653
Rochester, NH 03866

Subject: **Rochester: Acorn Terrace (EPAID: 2003020)**
Water Conservation Plan

Dear Mr. Williams:

On September 8, 2008, the Department of Environmental Services ("DES") Drinking Water and Groundwater Bureau approved a Water Conservation Plan for Acorn Terrace, located in Rochester, New Hampshire. On October 7, 2015, DES received an Amended Water Conservation Plan (the "Amended WCP"). The purpose of this letter is to approve the Amended WCP signed on October 5, 2015, per the following conditions: (Unless otherwise indicated, all conditions are effective as of the date of this Amended WCP Approval.)

1. Source meters, distribution meters, and any other meters measuring water consuming process prior to distribution shall be read on a monthly basis - no sooner than 27 days and no later than 33 days from the last meter reading.

2. All meters shall be tested and maintained based on the schedule proposed in the WCP.

3. All meters shall be installed per the manufacturer's instructions or American Water Works Association standards.

4. The system shall continue to report monthly water use on a quarterly basis to the DES Water Use Registration and Reporting Program using the DES OneStop reporting tool.

5. By **November 20, 2015**, distribution meters and data loggers shall be installed at each pump house and night flow analysis conducted at each pump house.

6. By **November 20, 2015**, the data from the first night flow analysis shall be submitted to DES.

7. Night flow analysis shall continue to be conducted at a rate of twice a year, but no sooner than 173 days after and no later than 187 days after the prior analysis. Data shall be kept on file and reported with the ongoing compliance report described in condition #10.

8. Leaks shall be repaired within 60 days of discovery. A leak log shall be maintained as described in condition #10.

9. An outreach and education program shall be implemented as proposed in the WCP. More specifically, water efficiency outreach materials shall be distributed to residents twice a year.

10. All new non-metallic pipes installed in the system shall be outfitted with detectable tracer tape or detectable tracer wire, or be GPS located and maintained in a GIS system.

11. Ongoing three year compliance reports shall be submitted every three years from the date of the original Water Conservation Plan Approval, September 29, 2008. The next compliance report is due on **September 29, 2017.** The following records shall be maintained by the water system to include with the report:

    a. Data from annual night flow analysis and a brief summary of the analysis.

    b. A leak log including the date a leak was discovered, the date a leak was repaired, the type of leak (ex. water main, service line, hydrant, valve), the approximate size of the leak (gpm), and the nearest address to the leak.

    c. The title of water efficiency materials distributed and the date of distribution.

    d. Date of installation and replacement of all meters, as well as testing and calibration records.

A copy of the Amended WCP and the *Water Conservation Plan Ongoing Compliance Form* may be located by going to the DES website, www.des.nh.gov, clicking on the "A-Z List" in the top right corner of the page, and scrolling down to Water Conservation.

Please feel free to contact me with any questions at (603) 271-0659 or via e-mail at stacey.herbold@des.nh.gov .

Sincerely,

Stacey Herbold
Water Conservation Program
Drinking Water and Groundwater Bureau

ec: Bethann McCarthy, DES
Leah McKenna, DES
Kelsey Vaughn, DES
Walter Devine, Acorn Terrace
Joseph Ducharme, CMA Engineers
Rob Bowers, ROCNH
Angela Romeo, ROCNH
Jay Levesque, Primary Operator

Community Water Systems
Water Conservation Plan
Drinking Water and Groundwater Bureau

AMENDED WATER CONSERVATION PLAN: **Acorn Terrace**

A community water system seeking authorization for a new source of water must submit a water conservation plan (WCP) to the New Hampshire Department of Environmental Services (NHDES) for approval demonstrating how the water system proposes to comply with water conservation standards pursuant to Env-Wq 2101, *Water Conservation*, rules. Acorn Terrace is an existing small community water system. A WCP was submitted by Acorn Terrace, formerly Rochester Terrace, and approved by DES on September 29, 2008 as part of the well approval process for Well #9.

Activities outlined in the water conservation plan will be completed by water system personnel under the supervision of a certified water system operator.

I. Introduction

A. Contact Information

1. Name and location of system: **Acorn Terrace Water System, Rochester**
2. Owner of system and mailing address:

Acorn Terrace Coop Inc
c/o Richard Williams
PO Box 653, Rochester, NH 03866

3. Park Manager:
Walter "Bear" Devine

4. Operator
Forest Pump & Filter Company, Inc.
Jay Lavesque

B. System Overview

1. Brief description of the project and water sources, including water sources to be developed for non-potable uses such as irrigation:

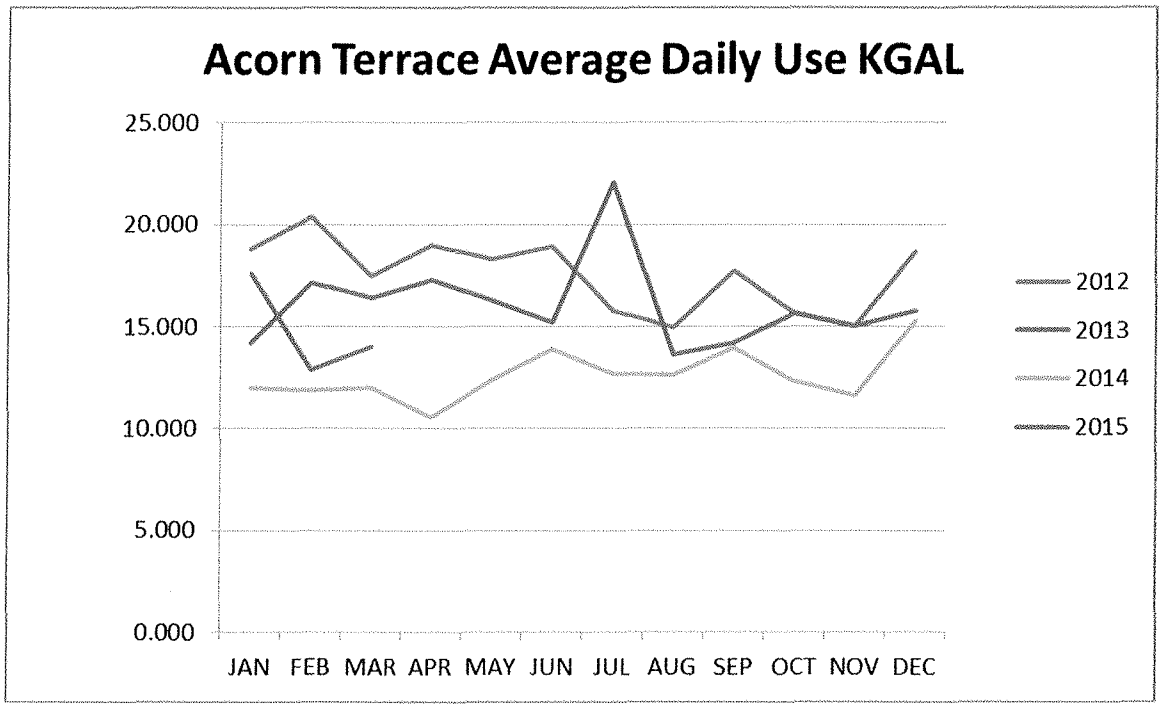
The Acorn Terrace Cooperative water system currently uses three wells connected to a plastic pipe distribution system with residential connections to 86 homes on the property. Water from BRW9 is pumped directly from the well through a well house at the south end of the property and into the distribution system. Water from Wells BRW6 and BRW7 is pumped through a well house at the north end of the property to three buried atmospheric storage tanks then is pumped with booster pumps to a pneumatic tank and into the distribution system. The proposed project will install a new atmospheric storage tank, replace the oldest water mains in the distribution system, and make improvements to the northerly well building.

2. Name designation of water sources sources: **BRW 6, BRW 7, BRW 9**
3. Number of existing residential connections: 86

4. Number of connections proposed at build out: 94
5. Number of other connections: 1 sampling tap.
6. **The water system does not provide water to any consecutive water systems or privately owned redistribution systems.**
7. **There are no proposed connections that will receive more than 20,000 gpd.**

C. System Trends

Most residential community water systems show an upward trend of water use from 25% to 50%. Acorn Terrace does not show this trend, which may be due to residents leaving water on during the cold winter months to keep pipes freezing and more leaks occurring in the cooler months.



II. System Side Management

A. Water Meters

1. Source and Distribution Meters

a) Water meters will be installed and maintained on all sources and distribution lines pursuant to "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance," (American Water Works Association, 2012).

b) Meter information for sources:

Source Name: **BRW 6**
Source Meter Make: **Master Meter**
Source Meter Model: **Multi-jet**
Source Meter Size: ¾-inch
Source Meter Installation Date: **February 2015**
Last Meter Test/Calibration Date: **New**

Source Name: **BRW 7**
Source Meter Make: **Master Meter**
Source Meter Model: **Multi-jet**
Source Meter Size: ¾-inch
Source Meter Installation Date: **February 2015**
Last Meter Test/Calibration Date: **New**

Source Name: **BRW 9**
Source Meter Make: **Master Meter**
Source Meter Model: **Multi-jet**
Source Meter Size: 1-inch
Source Meter Installation Date: **February 2015**
Last Meter Test/Calibration Date: **New**

c) Source meters will be read at least every 30 days.

2. Meter Selection, Installation, and Maintenance

a) All meters will be AWWA certified, with the exception of b), below.

b) AWWA does not have standards for magnetic flow meters. If a magnetic flow meter is proposed, the meter make, model, size, and manufacturer specifications will be forwarded to the NHDES Water Conservation program for review. The meter will not be installed until receiving approval for its use from NHDES.

c) The selected size of the meters will be based on projected flow rates.

d) Meters will be installed as specified by the manufacturer including requirements for horizontal or vertical placement, distance of straight run of

pipe upstream and downstream of the meter, and strainer installation. If the manufacturer does not supply installation specifics, meters will be installed in accordance with the "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance," (American Water Works Association, 2012).

e) The following meter testing and calibration schedule or meter change-out schedule will be implemented. If the manufacturer's accuracy warranty extends beyond the below schedule, the meter will be tested or changed-out no later than the warranty expiration date.

Meter Size (inches)	Testing Rate (yr)
<1"	10 yrs
1" - 2"	4 yrs
3"	2 yrs
>3"	yr

f) A log of the date meters were installed, tested, calibrated, repaired, and replaced will be maintained and calibration certificates will be kept on file.

B. Pressure Management

1. The design pressures of the system are from 30 psi to 70 psi (considers elevation differences within the Cooperative property).

2. The system will not have pressures over 100 psi.

C. Leak Detection Program

Night flows will be monitored quarterly for changes in low flows, indicating potential leakage. A Badger M2000 1" Magnetic Flow Meter with an accuracy of +/- 0.25% will be installed with flanged connections on the discharge pipe from each well house (two total). A 4-20mA output signal with an accuracy of +/- 0.25% will be sent to a DEVAR model SC-II-8k data-logger (one at each well house). This is a single channel data logger and will require two units, one for each meter. It will require one site visit to each well house every time the night flow analysis is performed to upload the data that has been recorded during the early morning hours. The meter will be located after treatment, any other water consuming processes, and storage. The meter make, model, and size will be forwarded to NHDES prior to purchase/installation for review and approval.

1. Baseline flow will be determined when the system is tight using the methodology in IIC.4, below. The system will be considered tight when (this may vary based on the size and age of the system):

a) A leak detection survey is conducted and all leaks discovered are repaired; or

b) An initial night flow analysis is conducted and night flow approaches zero gpm.

2. The results of the analysis and the proposed baseline flow will be submitted to NHDES for review. Once DES approves the baseline flow, the system will continue to monitor nigh flow monthly.

3. Each quarter BRW#9 will be shutoff and distribution flows will be measure from BRW#6 and BRW#7 (this pattern will alternate from quarter to quarter). Water usage will be recorded every minute for one hour between 1 am and 3 am using a distribution meter and data-logger. Prior to the night flow analysis, users of the system will be requested to refrain from using water between 1 am and 3 am on this date.

4. If flows are above the baseline, then flows will continue to be recorded for an additional hour.

5. If flows are more than 25 % above the baseline, a leak will be suspected and Step 9 will be taken.

6. If flows are no more than 25% above baseline, all residents will be asked to check their homes for leaks including running toilets. Step 4 will then be repeated again in 3 days.

7. If again flows are above the baseline, a leak on the distribution side of the system will be assumed.

8. If a leak is suspected, the leak will be isolated by closing valves to isolate select portions of the system, while evaluating the change in flow as measured by the distribution meter. For example, when one valve is closed, one person in the field (operating the valves) will then communicate with a second person observing the distribution meter to monitor for a change in the background flow.

9. No later than two weeks from isolating the leak to a certain branch of a system, a sub-contractor skilled in acoustic leak detection will be retained and assist with pinpointing the leak.

10. Leak detection methodologies will be conducted in accordance with "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (American Water Works Association, 2009).

11. Records will be maintained of each night flow analysis, including recorded flows and leak detection results.

D. Leak Repair and Tracking

1. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

2. A log of all leaks will be maintained including the date the leak was discovered, the date the leak was repaired, the type of leak (ex. service, main, hydrant, valve), the size of leak (gpm), and the nearest street address to the leak.

III. Consumption Side Management

A. Educational Outreach Initiative

The following education and outreach initiative will be implemented by:

1. The system will distribute water efficiency outreach materials twice each year with bills, the Consumer Confidence Report , or at the mail house. The materials distributed will be either NHDES Water Efficiency Fact Sheets located at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm#efficiency or EPA WaterSense materials located at http://www.epa.gov/watersense/ .

2. The system will maintain a log indicating how the system has complied with III. A.1., above. The log will include dates the outreach and education actions were taken and what was done.

IV. Reporting and Implementation

A. The water system will submit a form supplied by NHDES once every three years from the date of the original water conservation plan approval, September 29, 2008, documenting how compliance with the requirements of Env-Wq 2101 *Water Conservation* are being achieved.

B. The data collected with each night flow analysis from the previous three years, as well as a statement as to whether a leak was suspected or not and if so, when the leak was repaired, will be submitted with the report form in V.A., above.

C. The water system will continue to report monthly production volumes, quarterly to the NHDES Water Use Registration and Reporting Program. Monthly means once every calendar month, but not sooner than 27 days after and no later than 33 days after the previous reading.

Plan Certification

I certify that I have read this Water Conservation Plan, understand the responsibilities of the water system as referenced in the plan, and that all information provided is complete, accurate, and not misleading.

Owner Name (print): Richard Williams PRESIDENT

Owner Signature: Richard Williams Date: 10/5/15

Thank you.

Appendix A
Definitions

Authorized metered consumption: billed metered water plus unbilled metered water.

Community water system (CWS): a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Consecutive water system: a public water system that buys or otherwise receives some or all of its finished water from one or more wholesale systems for at least 60 days per year.

Final Source Approval: the date of final well siting approval or the date of issuance of the large groundwater withdrawal permit.

Large community water system: a community water system that serves more than 1,000 persons.

Privately owned redistribution system (PORS): A system for the provision of piped water for human consumption which does not meet the definition of a public water system and meets all of the following criteria:

(1)Obtains all of its water from, but is not owned or operated by a public water system; (2) serves a population of at least 25 people, 10 household units, or 15 service connections, whichever is fewest, for a least 60 days per year; and (3) has exterior pumping facilities, not including facilities used to reduce pressure, or exterior storage facilities which are not part of building plumbing.

Public water system (PWS): a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Small community water system: a community water system that serves 1,000 people or less.

Source activation date: the date the source is placed into use.

System input volume: the volume of water input to the water supply system after treatment, analysis, and storage.

Water balance: the difference between the system input volume and authorized metered consumption.

Water conservation: any beneficial reduction in water losses, waste, or use.

Wholesale system: a public water system or an industrial, commercial, or institutional (ICI) water user that treats source water and then sells or otherwise delivers finished water to a consecutive water system or privately owned distribution system.