The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

WATER CONSERVATION PLAN APPROVAL

March 27, 2014

Jon Lariviere
Trendezza LLC
172 Route 101, Unit 25C
Bedford, NH 03110

RE: Kingston – King's Landing Development
Water Conservation Plan, NHDES # 999839

Dear Lariviere:

On February 28, 2014, the New Hampshire Department of Environmental Services ("DES") Drinking Water and Groundwater Bureau received a Water Conservation Plan (the "WCP"), signed on February 25, 2014**,** for the King's Landing Development's water system located in Kingston, New Hampshire (the "Plan"). Pursuant to RSA 485:61 and Env-Wq 2101, community water systems seeking permits from DES for new sources of groundwater shall submit a water conservation plan to DES. Based on review of the WCP, DES has determined the WCP complies with Env-Wq 2101, *Water Conservation* rules and specifically with the rules for new community water systems.

Pursuant to Env-Wq 2101.25, the Town of Kingston and the Rockingham Planning Commission were provided a copy of the WCP.

DES approves the WCP based on the following conditions:

1. Prior to system activation, all source and distribution meters and data loggers shall be installed.

2. Upon system activation, source meters and distribution meters shall be read monthly, no sooner than 27 days and no later than 33 days from the last meter reading.

3. Upon system activation, a night flow analysis using the distribution meter and data logger shall be conducted at least once a year in accordance with the WCP. Night flows will be recorded at least once a month for the first12 months. Night flows will be submitted to DES upon completion of the final analysis. The lowest flow shall be considered the baseline flow upon DES Approval.

4. Upon system activation, reporting monthly production volumes to the NHDES Water Use Registration and Reporting program on a quarterly basis shall begin. DES will assign the

system a WUID number and provide instructions for registering as a data provider and utilizing the DES OneStop reporting tool.

5. Upon system activation, a water balance, the difference between the system input volume and the volume consumed, shall be reported annually to DES. The water balance shall be reported by March 1 for the prior year using the online reporting tool.

6. Prior to connection to the water system, service connections shall be outfitted with meters and outside read pads.

7. All service meters shall be read on a quarterly basis.

8. Upon system activation a rate structure shall be implemented. Residents shall be charged based on the amount of water each residence uses and the rate shall be structured so that the cost per gallon(s) is either constant or increasing with the amount of water used.

9. Upon system activation, quarterly billing shall commence.

10. Upon system activation, water efficiency education materials shall begin to be distributed twice a year to residents in accordance with the WCP.

11. All meters shall be maintained based on the schedule proposed in the WCP.

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

13. Every three years from the date of this approval, a *Water Conservation Plan Ongoing Compliance Form* shall be submitted to DES documenting how the system has maintained compliance with the WCP. The following records shall be maintained by the water system to include with the report:

    a. 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), and the approximate size of the leak (gpm).

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

    c. Date of installation and replacement of all meters and testing and calibration records.

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

14. Proposed changes to the WCP shall not be implemented unless approved by DES.

The online *Annual Water Balance Reporting Form* 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: Andrew Ashton, Sanborn, Head & Associates, Inc.
Diana Morgan & Steve Roy, NHDES
Derek Bennett, NHDES *(AC)*
Town of Kingston
Rockingham Planning Commission

Water Conservation Plan
New Community Water System
King's Landing Development
Kingston, New Hampshire
February 2014

I. INTRODUCTION

The proposed King's Landing Development will include a 44-unit age-restricted housing development (single family, 2 bedroom detached condominiums) located on a 35.16 acre property identified as Lot 27 on Kingston Tax Map R-33. It is proposed that water for the residential development will be supplied by a new small community water system with water obtained from one of two bedrock wells located on the property. The source capacity for the water system is calculated as approximately 55,200 gallons per day. In-ground irrigation is proposed for lawn and garden areas and will be supplied by a separate overburden well also located on the property. The irrigation system will be operated by the Condominium Association. Although the irrigation system will be installed as a physically separate system to the small community water system, the estimated water use and operation is included as part of the overall water conservation plan for the development.

The purpose of this comprehensive water conservation plan for the proposed new small community water system is to demonstrate how the water system proposes to comply with water conservation standards pursuant to Env-Wq 2101, Water Conservation, and specifically to Env-Wq 2101.04, Requirements for New Community Water Systems. The plan outlined below addresses the requirements of the NHDES Water Conservation Plan.

A. Contact Information

1. Name and location of system.

   King's Landing Development
   22 Marshall Road
   Kingston, NH

2. Owner of system and mailing address.

   Trendezza LLC
   172 Route 101, Unit 26C
   Bedford, NH 03110

3. Name and mailing address of designer of water conservation plan.

   Sanborn, Head & Associates, Inc.
   20 Foundry Street
   Concord, NH 03301

B. System Overview

1. *Number of connections proposed for each of the following classes:*

   a) There are 44 residential connections on the proposed system.

   b) There are no industrial, commercial, institutional, or municipal connections on the proposed system.

   c) There are no municipal connections on the proposed system.

2. *Description of any connections that will receive more than 20,000 gpd.*

   None.

C. Water Use Trends / Population Trends

1. *Anticipated seasonal fluctuation in water use and reason for fluctuation.*

   Water use is expected to decrease during winter months due to seasonal changes in resident population and due to decrease outside water use.

2. *Anticipated growth in population and seasonal fluctuation in population.*

   Given the current development plan and property size restraints, there is limited possibility for future development associated with the site; therefore future population growth is not anticipated. Some seasonal fluctuation in resident population is anticipated; it is likely that a maximum of 44 occupied residences will occur during the summer months with a decreased population during the winter months.

D. Transfer of Ownership

1. *Upon completion of development, will the water system be sold/transferred to a private utility company, a homeowners type association, or some other entity? If yes, who and when?*

   It is proposed that following completion of the residential development ownership of the water system will be transferred to a water utility company or a homeowner-type association. If ownership of the system is transferred, the current owner will provide a copy of the Water Conservation Plan to the new owner prior to final purchase.

II. SYSTEM SIDE MANAGEMENT

A. Source Meters

1. Prior to activation of the system, water meters will be installed for each water source, at the point of water distribution to the system, and on the separate irrigation well water source.

2. *Name designation of each water source.*

   Bedrock well #1: S-01
   Bedrock well #2: S-02

3. *Meter make, model, size, and flow range for each new water source (if known).*

   Not known.

4. *Frequency that source meters will be tested/calibrated.*

   Meters will be tested and calibrated/repaired or changed out based on manufacturer specifications. If the manufacturer does not provide testing specifications, the following testing and calibration schedule or meter change-out schedule will be implemented upon expiration of the manufacturer's accuracy warranty:

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

5. *Frequency that source meters will be read (at least every 30 days).*

   The source meters will be read at least once every 30 days. In addition, it is proposed that the source meters will be equipped with data logging capabilities.

The following statements will apply to all water meters installed as part of the system:

6. All meters will be ANSI certified to guarantee that the meters meet AWWA standards.

7. The selected size of the meters will be based on projected flow rates of the system.

8. 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 DES Water Conservation program for review. The meter will not be installed until receiving approval for its use.

9. Meters will be installed in accordance with all of the manufacturer's installation instructions such as vertical or horizontal placement, distance of straight run of pipe upstream and downstream of the meter, and strainer installation.

10. Source meters will be installed in accordance with "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance," (American Water Works Association, 2012).

B. Service Meters

1. *Will separate irrigation meters be installed?*

   Individual irrigation systems will not be available at the residences. Common lawn and garden areas will be irrigated by a community irrigation system supplied by a dedicated overburden well. The single irrigation water source will be fitted with a dedicated source meter.

2. All service connections will be metered prior to system startup and the means of reading the meter will be accessible outside of the residence.

3. *Frequency that service meters will be read (at least every 90 days).*

   Service meters will be read at least every 90 days. If the proposed quarterly billing cycle is adjusted to be more frequent than quarterly then the 90 day period will be adjusted in parallel with the billing cycle.

4. *Description of all methods that will be used to read service meters.*

   It is anticipated that service meters will be read manually by the system operator.

5. *Expected number of days needed to read all service meters.*

   It is anticipated that a maximum of 1 day will be required.

6. *Proposed rate of meter testing and/or meter change out.*

   It is anticipated that the residential service meters will have an accuracy warranty of 10 to 20 years depending on the model. At the end of the warranty the meter will be replaced or tested for accuracy and if the meter no longer meets AWWA accuracy standards then it will be replaced. It is proposed that meter replacement will begin starting 10 years after initial activation of the service meter. Subsequently, approximately 10% of meters will be replaced every year on a rolling basis such that all services meters are replaced once within a 10 year period.

7. Service meters will be selected, installed, and maintained in accordance with "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance," (American Water Works Association, 2009).

C. Water Balance and Water Audit

1. The water balance of the system will be conducted at least once per year and submitted to DES by March 1 for the prior year.

2. A water audit will be calculated in accordance with "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (American Water Works Association, 2009).

3. The water system will prepare and submit a water audit and response plan if more than 15% of system input volume cannot be accounted for by authorized metered consumption. The response plan will identify how the water system intends to reduce the percentage to below 15% within two years.

D. Leak Detection

1. *Will pipe material be non-metal? If yes, as leaks are difficult to acoustically detect in non-metallic systems, what additional measures will be taken to detect leaks?*

   Water distribution pipe material will be non-metal. All non-metallic pipes shall be outfitted with detectable tracer tape or detectable tracer wire, or the pipes will be GPS located and maintained in a GIS system.

   A data-logging distribution meter will be installed and the data will be used to assess changes in water use over time. At least once every 12 months the system operator will assess the data to determine flow rate into the system during anticipated low-flow periods e.g. night time hours. For each 24 hour period the lowest daily flow will be identified and recorded as the daily minimum flow. If a daily minimum flow greater than three gallons per minute is identified and from that date to the end of the period of record the daily minimum flow continues to be greater than three gallons per minute then the following steps will be taken:

   1. An email or other notice will be sent to all residents requesting that they check their homes for leaks, running toilet, hoses etc. and make necessary repairs. A review of the daily minimum flows will be conducted again with 7 days and if the daily minimum flow continues to be greater than three gallons per minute then Step 2 will be taken.

   2. A detailed assessment of the system will be performed including visual assessment and shutting off individual service connections while monitoring the low-flow bypass meter. Acoustic survey will be used to help locate suspected leaks.

2. *Will zone meters be installed to assist with leak detection identification and location?*

   No.

3. *Will future leak detection surveys be conducted in-house or contracted out?*

   Acoustic leak detection surveys will be contracted out to a professional. Other aspects of the leak detection survey described above will be performed by the system operator.

4. *If in-house, what equipment will be used and what training will be required?*

In-house leak detection will use existing distribution and service meters along with curb stops and system valves as necessary to isolate suspected leaks. It is anticipated that the system operator will perform the in-house survey and no special training will be required.

5. *If in house, describe the leak detection method to be used.*

   A data-logging distribution meter will be installed and the data will be used to assess changes in water use over time. If the method described in D.1 above identifies a suspected leak then detailed assessment of the system will be performed including visual assessment and shutting off individual service connections while monitoring a low-flow bypass meter or reviewing data from the logging meter. Acoustic survey will be used to help locate suspected leaks.

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

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

E. Pressure Management

1. *What are the design pressures of the system?*

   Design pressures for the system are anticipated to range from 40 to 60 psi and will be confirmed during final system design. Design pressures in excess of 80 psi are not anticipated.

2. *How will pressure be monitored?*

   Pressure will be monitored at the pump house using a permanently installed pressure gauge on the distribution line. Following initial construction, the system pressure during operation will be checked at representative locations in the system to confirm the design pressure, and to determine the relationship between pump house and system pressure. Pump house pressure will then be monitored and recorded at least once every 30 days. System pressure will be adjusted as necessary by the operator to maintain the design pressure of the system.

3. *Are there proposed to be any zones in excess of 80 psi? If so, explain why and describe what method will be used to reduce pressures?*

   There are no zones in the system proposed to be in excess of 80 psi.

4. *If pressure reduction is not feasible, please explain why and describe what additional steps the water system will take to monitor and repair leakage within these zones.*

   Not applicable.

III. CONSUMPTION SIDE MANAGEMENT

A. Conservation Rate Structure and Billing

1. The water system will adopt a rate structure that complies with 2101.04 (o) and DES will be notified of the new structure no later than the first billing cycle.

2. *If irrigation meters are installed, will irrigation water be billed at a different rate?*

   Individual irrigation systems will not be available at the residences. Common lawn and garden areas will be irrigated by a community irrigation system supplied by a dedicated overburden well. The single irrigation water source will be fitted with a dedicated source meter. The cost of operating the irrigation will be paid by the Condominium Association.

3. *Will a seasonal rate structure be utilized in addition to the general rate structure?*

   No.

4. *Proposed billing frequency (minimum is quarterly).*

   Quarterly.

5. *Informative billing practices to be used (ex. water use in gallons / usage history).*

   Quarterly water use will be reported on bills on a rolling annual basis in the form of a table and/or graph. Usage will be reported as average gallons per day for each quarter.

B. Educational Outreach Initiative

1. *Informational materials that will be used.*

   Informational material available from NHDES and/or US EPA which is relevant to the type of water use anticipated for the development will be distributed with water bills.

   Proposed materials include:

   - WD-DWGB-26-18 Home Water Efficiency: Bathrooms
   - WD-DWGB-26-19 Home Water Efficiency: Kitchen and Laundry
   - WD-DWGB-26-23 Home Water Efficiency: Fixing Leaks Indoors and Out
   - WD-DWGB-26-25 Home Water Efficiency: Home Water Audit

2. *Rate of dissemination.*

   Informational material will be provided with bills approximately every 6 months.

3. *Does the water system intend on becoming a WaterSense partner?* *http://www.epa.gov/watersense/*

   No.

4. *Will a rebate program be offered to replace older fixtures with WaterSense certified fixtures?*

   No.

5. *Will customer audits be offered?*

   No.

6. *Other outreach plans?*

   No.

IV. ZONING ORDINANCE / BYLAWS

A. Are connections to the water system subject to any of the following water efficiency ordinances or bylaws?

Water efficiency ordinances or bylaws are not proposed for the water system.

V. WATER USE RESTRICTIONS

A. What is the water system's plan relative to implementing water restrictions?

Use of the community irrigation system will be reduced or restricted, as needed, during periods of water shortage.

B. Who is responsible for enforcing restrictions?

Water restrictions will be enforced by the system operator on behalf of the system owner.

VI. REPORTING AND IMPLEMENTATION

The water system will submit a form supplied by DES once every three years documenting how compliance with the requirements of Env-Wq 2101 is being achieved.

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

VII. PUBLIC NOTIFICATION

Within 10 days of submitting the conservation plan to DES, the applicant shall provide a copy of the plan via certified mail to the governing board of the municipality in which a

proposed source is located, and the regional planning commission serving the location of the proposed source.

CERTIFICATION

I certify that the information provided in this water conservation plan is accurate and true to the best of my knowledge and I understand the requirements of the plan. I will provide a copy of the plan to the primary operator of the system and will determine who is responsible for what sections of the plan.

Signature of System Owner — Date: 2/25/14

ADDITIONAL ATTACHMENTS

The applicant must provide the governing boards with a summary of the requirements of Env-Wq 2101, which may be found at http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm and request that the governing board amend local site planning requirements to reflect the requirements of Env-Wq 2101 or to promote water efficiency.