

Dear Operators of Community Water Systems:

The Awwa Research Foundation (AwwaRF) in cooperation with the California Energy Commission and the New York State Energy Research Authority is conducting a national survey of drinking water systems using the attached questionnaire. This survey is part of a research effort to develop energy metrics that will ultimately support energy management benchmarking efforts in the water industry.

Comparing energy use among utilities requires consideration of the constraints of operating conditions and requirements imposed by local conditions and existing configurations. The survey asks about your energy use as well as key characteristics of water production, treatment, and distribution that impact energy use. The goal of the project is to produce the analysis that will consider all of these parameters in a metric that will make energy use among different utilities comparable. More information about the project scope is available on the AwwaRF website at:

<http://www.awwarf.org/research/TopicsAndProjects/projectSnapshot.aspx?pn=3009>

The success of the project depends on the availability of statistically representative data about the water industry. Your utility was chosen to represent a portion of the industry. Please complete the survey and return it in the enclosed envelope. We will only make use of the information you provide when it has been aggregated with responses of many other utilities. We will never disclose your name or the name of your water system in any public documents.

Should you have any questions you may contact the contractor performing the survey at 608-882-0111.

Please return the survey in the enclosed envelope

or mail it to:

CDH Energy Corp.
P.O Box 641
Cazenovia, NY 13035-0641

Sincerely,



Steven W. Carlson, P.E.
Principal Investigator
CDH Energy Corp.
608-882-0111
Fax: 775-890-5505
carlson@cdhenergy.com

Water Utility Energy Use Survey

Contact Information

Water System ID:..... _____

Facility Name:..... _____

Facility Address: _____

Name of Person Completing Survey: _____

Phone: _____ E-mail: _____

Water Source Characteristics

1. What was the daily amount of water produced from each source in 2004?

| <i>Source</i> | <i>Number of Wells/Sources</i> | million gallons per day – MGD | | |
|-------------------|--------------------------------|-------------------------------|----------------|---------------|
| | | <i>Average</i> | <i>Maximum</i> | <i>Design</i> |
| a. Ground | | | | |
| b. Surface &GWUDI | | | | |
| c. Purchased | | | | |

2. For ground sources what is the average well depth?.....(feet) _____

3. What is the total raw water pumping motor horsepower (excluding backup pumps)?....(hp)_____

4. How many raw water pumps are included above?.....(No. pumps)_____

5. What was the average raw water turbidity for each source in 2004?

| <i>Source</i> | Nephelometric turbidity units - NTU | |
|---------------|-------------------------------------|-------------|
| | <i>Average</i> | <i>Peak</i> |
| a. Ground | | |
| b. Surface | | |

Treatment Objectives

6. Please mark [yes] or [no] for each water treatment objective pertaining to the majority of your treatment plants.

- | | | | |
|----------------------------|------------|---|------------|
| Algae controla. | [yes] [no] | Particulate/Turbidity removalh. | [yes] [no] |
| Disinfectionb. | [yes] [no] | Softening (hardness removal)i. | [yes] [no] |
| Oxidationc. | [yes] [no] | Recarbonationj. | [yes] [no] |
| Iron removald. | [yes] [no] | Organic contaminate removalk. | [yes] [no] |
| Manganese removale. | [yes] [no] | Inorganic contaminate removall. | [yes] [no] |
| Taste/odor controlf. | [yes] [no] | Radionuclide contaminate removalm. | [yes] [no] |
| TOC removalg. | [yes] [no] | | |

Treatment Processes

7. Please mark [yes] or [no] for each water treatment process pertaining to the majority of your treatment plants.

- | | | | | | |
|----------------------------------|----|------------|----------------------------|----|------------|
| Aeration (conventional) | a. | [yes] [no] | - Slow sand | i. | [yes] [no] |
| UV | b. | [yes] [no] | - Dual Stage | j. | [yes] [no] |
| Ozone | c. | [yes] [no] | - Rapid Rate | k. | [yes] [no] |
| <i>Clarification</i> | | | - Diatomaceous earth | l. | [yes] [no] |
| - Upflow | d. | [yes] [no] | - Pressure | m. | [yes] [no] |
| - Gravity | e. | [yes] [no] | <i>Membranes</i> | | |
| - Dissolved Air Floatation | f. | [yes] [no] | - Reverse osmosis | n. | [yes] [no] |
| Flocculation | g. | [yes] [no] | - Microfiltration | o. | [yes] [no] |
| <i>Filtration</i> | | | - Ultrafiltration | p. | [yes] [no] |
| - Direct | h. | [yes] [no] | - Nanofiltration | q. | [yes] [no] |

9. How many treatment plants are typically in use? (No. plants) _____

Residual Management

10. Please mark [yes] or [no] for each residual process pertaining to the majority of your plants.

- | | | | | | |
|-----------------------------|----|------------|-------------------------------------|----|------------|
| No treatment | a. | [yes] [no] | Belt Press | g. | [yes] [no] |
| Gravity thickening | b. | [yes] [no] | Plate & Frame Press | h. | [yes] [no] |
| Mechanical dewatering | c. | [yes] [no] | Non-Mechanical Dewatering | i. | [yes] [no] |
| Centrifuge | d. | [yes] [no] | Lagoon dewatering, thickening | j. | [yes] [no] |
| Pressure Filtration | e. | [yes] [no] | Sand drying bed | k. | [yes] [no] |
| Vacuum Filtration | f. | [yes] [no] | Freezing and thawing | l. | [yes] [no] |

11. What was the total daily average residuals production in 2004? (lbs/day) _____

Distribution

12. What is the population of the service area? (No. people) _____
13. What is the approximate size of the service area? (square miles) _____
14. What is the total length of distribution mains? (miles) _____
15. What are the high and low elevations of the distribution system..... (high/low ft) _____ / _____
16. How much pumping horsepower is used in distribution (exclude backup)? (hp) _____
17. How many distribution pumps are included above..... (No. pumps) _____
18. What is the total storage volume? (millions of gallons MG) _____
19. What is the average distribution pressure? (psi) _____
20. How many pressure zones are used in the distribution system? (No. zones) _____
21. How much treated water is unaccounted for? (%) _____

Energy Use

22. Please provide electricity use and cost for production, treatment and distribution in 2004. Peak demand is the largest monthly demand (kW) recorded in 2004.

| <i>Electricity</i> | <i>Use (kWh)</i> | <i>Peak Demand (kW)</i> | <i>Total Electricity Cost (\$)</i> |
|--------------------|------------------|-------------------------|------------------------------------|
| a. Production | | | |
| b. Treatment | | | |
| c. Distribution | | | |
| d. Total | | | |

23. Total floor area of buildings served by above electricity..... (square feet) _____

24. Please provide natural gas use and cost for the entire utility in 2004.

| <i>Natural Gas</i> | <i>Use (therms)</i> | <i>Total Natural Gas Cost (\$)</i> |
|--------------------|---------------------|------------------------------------|
| a. Total | | |

25a. Are any engine driven pumps used?[yes] [no]

25b. What is the total engine horsepower.....(hp) _____

25c. What is the engine fuel?..... natural gas, diesel, other: _____

26a. Do you purchase other energy?[yes] [no]

26b. Type of energy source? (propane, oil, etc)specify: _____

26c. Amount of energy used? (specify units: _____) _____

26d. Energy cost?(\$) _____

27. Does someone in operations regularly (monthly/quarterly) review the utility energy bills?...[yes] [no]

28. Were there any extraordinary events in 2004 that impacted energy use?[yes] [no]

