

NCS FACT SHEET

A SUMMARY OF INFORMATION RELATED TO DANE COUNTY'S PURCHASE OF A NUTRIENT CONCENTRATION SYSTEM AT THE MIDDLETON COMMUNITY MANURE DIGESTER



INTRODUCTION

Dane County has been working collaboratively with GL Dairy Biogas, Dynamic Systems Management, and the three participating farms of the Middleton Community Manure Digester in evaluating, selecting and purchasing Nutrient Concentration System (NCS) technology from AQUA Innovations, LLC. AQUA Innovations was selected as the technology provider as a result of a Dane County Request for Proposals. This fact sheet is intended to summarize some of the highlights from both the *Springfield Clean Water LLC Business Plan* developed by Dynamic Systems Management, LLC. and Dane County's purchase contract with AQUA Innovations, LLC. Refer to these documents for more details.

COSTS

DANE COUNTY - \$1,650,000

- Includes all equipment, delivery, installation, and commissioning.

FARMERS - \$331,457 annually

- Includes all annual operational and maintenance costs of the system.

SYSTEM PERFORMANCE

- Technology selected is NuWay 8000D Environmental Nutrient Management System supplied by AQUA Innovations, LLC.
- Guaranteed to reduce the volume of centrate applied to agricultural fields by a minimum of 50%.
- 3-year performance guarantee by AQUA Innovations, LLC upon commissioning.
- NCS design capacity is 100,000 gallons per day.
- Anticipated treatment is approximately 65,000 gallons per day.
- Reserve capacity of 35,000 gallons per day (35%).
- Minimum clean water generation of 32,500 gallons per day to be returned to the watershed.
- Generation of 32,500 gallons per day of concentrated centrate to be applied to agricultural fields.

OWNER OPERATOR STRUCTURE

- Dane County purchases and owns NCS equipment.
- Dane County leases the equipment to Springfield Clean Water, LLC (owned by Dynamic Systems Management, LLC.).
- Springfield Clean Water holds the WDNR WPDES permit and operates the NCS system.
- Springfield Clean Water has a service agreement with the participating farmers to cover operational expenses.

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ENVIRONMENTAL BENEFITS

- Returning 35,000 gallons per day of clean water back to either surface water or groundwater.
- Reducing centrate field application rates by 50%.
 - Research has shown that decreased application rates significantly reduces phosphorus loss in runoff (Thayer, Gilley, Durso, & Marx, 2012).
 - Regression analysis indicates a phosphorus reduction from the NCS of 1,112 pounds.
 - Yahara Clean Engineering Report indicates a phosphorus reduction from additional digester treatment of 1,122 pounds.
- Increased flexibility in the timing of centrate applications.
 - Avoid applications during sensitive conditions.
 - Reduce fall applications when no crops are growing to take up nutrients.
- Improved economic viability in applying centrate to further distant fields.
- 3,000 less semi-trucks per year using nearby roads to apply the processed centrate.

COST PER POUND OF PHOSPHORUS REDUCED

DANE COUNTY - $\$1,650,000 \div 1,112 \text{ to } 1,122 \text{ pounds of phosphorus} \div 20 \text{ years} = \mathbf{\$74.19}$ to $\mathbf{\$73.53}$ per pound of phosphorus per year.

YAHARA CLEAN STRATEGIC ACTION PLAN FOR PHOSPHORUS REDUCTION

Urban Actions - \$25 to \$860

Rural Actions - \$49 to \$390

ADDITIONAL COMMENTS AND CONCERNS

- A new WDNR WPDES permit for a surface water discharge to the north fork of Pheasant Branch Creek is being drafted for approval.
 - Application material has been submitted and accepted by WDNR.
 - Mixing Zone study is underway.
- Implementation of this technology will *not* facilitate expansion of participating farm operations.
 - The NCS system does not remove additional nutrients from the watershed. Expansion is limited based on the amount of land a producer has to effectively apply these nutrients on and in accordance with their Nutrient Management Plans and UW recommended crop nutrient needs. The decreased volume of applied centrate reduces the runoff and delivery of phosphorus and nutrients to nearby surface waters.
 - i.e. if more manure nutrients are produced more land and crops are needed in order to take up these nutrients.
- Procedures are in place, as well as a 35% reserve capacity of the NCS system, to allow for additional participants at the Middleton Digester facility.
- Excessive phosphorus buildup in the soil, as a result of over application of centrate, is prohibited under the Land Spreading Agreement and GLDairy WPDES Permit.