Treated Wastewater Effluent:

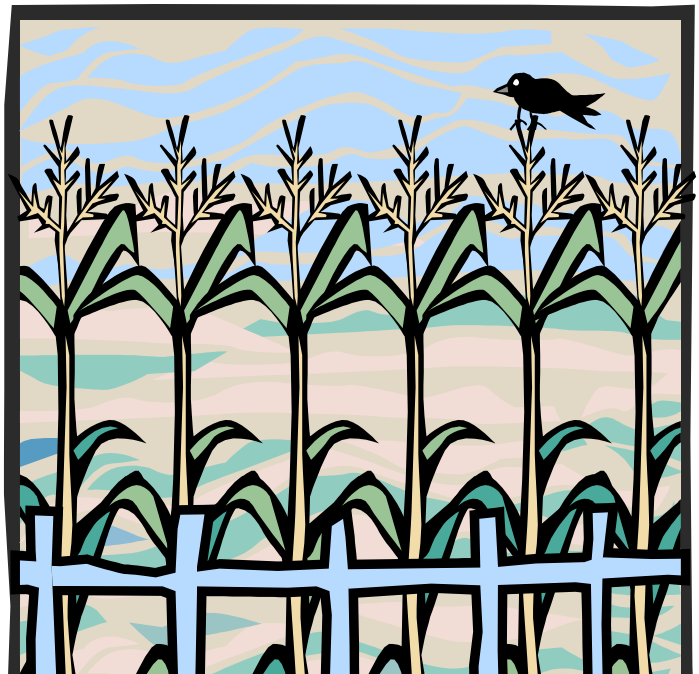
A Reclaimable and Reusable Resource

For

Delaware Agriculture

IRRIGATION PRESERVATION TASK FORCE
HOUSE CONCURRENT RESOLUTION 67

FINAL REPORT AND RECOMMENDATIONS



INTRODUCTION AND BACKGROUND

During the 144th General Assembly House Concurrent Resolution No. 67 created the Irrigation Preservation Task Force. The Task Force was created to develop and submit legislation that will help to sustain Delaware agriculture through the use of reclaimed water. One of the benefits is the preservation of the ground waters of the State by allowing the farmer the voluntary use of treated wastewater effluent, the current standards for the source of which are established by the Department of Natural Resources and Environmental Control. Other benefits to agriculture include:

- Irrigation delivered directly to a farmer's field as needed.
- Reliable, continuous supply of reclaimed water lowers farm operations cost
- Makes water available during drought conditions
- Irrigated fields have a higher yield harvest per acre compared to non-irrigated fields
- Sustains small farms as a way of life
- Provides permanent jobs in agriculture
- Provides for uptake of nutrients and prevents runoff

There are economic, environmental and societal benefits to the practice of recycling treated water back to farmers through spray irrigation of reclaimed water. Delaware's policy on water and wastewater, while designed to serve a growing population with fresh water and wastewater capacity, needs to serve Delaware's agriculture as well. Water should not just be used once and thrown away. Reclaimed water can be recycled to farmlands to promote sustainable farming and return the water to the watershed for recharge of the aquifer.

The reclaimed wastewater resource comes from a diverse number of plants. Over 60 municipal and private wastewater treatment plants produce 10.8 billion gallons of reclaimed water, or 33,140 acre feet/year. Some of these facilities already have disposal areas for the reclaimed water. But many municipal and private treatment plants are out of treatment disposal capacity or will see their NPDES permits capped with no additional capacity for future expansion.. The remaining municipal and private plants either cannot discharge into surface waters or have their discharge limit capped. These plants could be the largest source of reclaimed water; approximately 8.3 billion gallons, or 25,460 acre feet annually. (source: DNREC list, all but Wilmington). The reclaimed water can be used by farmers if wastewater service providers have the incentive to pipe it to farmers' fields, and the farms have the ability to take the water.

The State Department of Agriculture, Task Force members, and Department of Natural Resources and Environmental Control (DNREC) support the reclamation of wastewater. There is widespread and increasing interest by the DNREC, municipalities, the agriculture community, and wastewater utilities for the use of reclaimed water for agricultural irrigation.

* For the purpose of this report Reclaimed Water is defined as water that has been recovered through the treatment of sanitary wastewater at a wastewater treatment facility. Reclaimed Water contains macronutrients, micronutrients, suspended solids, and small quantities of bacteria, salts and metals. In order to protect public health, wastewater must undergo significant levels of treatment and disinfection before it can be reclaimed and reused for agricultural purposes.

Additionally,

The purpose of this report is to educate decision makers and other interested parties about the advantages of using reclaimed water for the irrigation of agricultural lands; address the charge to us as stated in HCR 67; and submit our findings and recommendations for further consideration by the General Assembly. The Task Force was asked to submit this report to the General Assembly by January 15, 2009.

TASK FORCE FINDINGS

Wastewater can be made available for agricultural reuse in two (2) ways. In voluntary reuse treated wastewater lines are extended from treatment facilities to farming operations and the reclaimed water is made available on an "as needed" basis to the farming operation to irrigate crops consistent with existing farming practices. In these situations the farming operation benefits from a pressurized supply of available water, and thereby reducing the need to pump groundwater or surface water supplies. This alternative has many of the same benefits to the farmer and environment as the following Leased Land option, but does not generate a specific wastewater disposal capacity for the wastewater entity.

As an alternative agricultural reuse option, certain wastewater entities have designed a special economic package for Delaware farm families. The wastewater entity offers to lease the farming acres while still allowing farmers to farm the land, preserve the land, and conduct and hunting or recreation activity on the land that is compatible with the lease. The wastewater entity has proposed that the farmer retain ownership, but put the land to work under an irrigation lease. If the farmer would agree to take the reclaimed water as irrigation flow, then the private utility would deliver the water to the field and pay the farmer to take it. Leases with farmers to apply treated reclaimed water need to be flexible enough to provide predictable financial returns for farmers while at the same time providing long term certainty (30-plus years) for the wastewater treatment entities. The land lease proposition has several benefits to the farmer:

Benefits to the Farmer

1. Irrigation lease provides farmers with affixed return on their equity in land
2. Reduces fuel costs to pump the water to the fields
3. Reduces some fertilizer costs through "fertigation" providing nutrients in the reclaimed water
4. Increases crop yield through the continuous flow of reliable, reclaimed water
5. Renders the fields drought resistant through reliable flow of reclaimed water
6. Provides more efficient and consistent uptake and use of nutrients
7. Provides additional incentives to preserve farmland
8. Lease option provides supplemental income to agricultural operation

Benefits to the Environment & the Public

The use of reclaimed water for agricultural purposes benefits the environment and the public while reducing government spending.

Environment

- Returns reclaimed water to the watershed for crop production

- Reduces aquifer withdrawal by the amount of reclaimed water applied
- Recharges groundwater aquifers
- Assures perpetual open space for farming and recreation (hunting)
- After nutrient uptake, less nutrients lost to surface waters and other environmentally sensitive areas
- Preserves open space for multiple uses
- Reduces the amount of commercial fertilizers imported into the watershed

Government

- Centralization of reclaimed water infrastructure directs and controls growth
- Reduces infrastructure costs to rate payers and taxpayers
- Enables the elimination of faulty residential wastewater systems
- Enables cooperation between public and private entities
- Promotes more efficient use of state's water resources
- Provides another option for municipalities to comply with pollution control strategies

Advantages & Disadvantages

Interest in receiving reclaimed irrigation water is high among farmers. The Task Force discussed certain advantages and disadvantages with the use of treated wastewater for agricultural irrigation:

Pros Include:

1. Consistent reliable source of additional irrigation water
2. Increases and stabilizes farmers' yield per acre and balances nutrient loads
3. Reduces fuel cost to pump water from wells
4. Reduces fertilizer cost through "fertigation"
5. Low cost source of irrigation water for Delaware farmers
6. Economical and acceptable environmental way to recycle reclaimed water
7. Reclaimed water is available to farmers during drought conditions
8. Returns water to the watershed
9. Recharges valuable groundwater for other uses
10. Provides permanent jobs in agriculture

Cons Include:

1. Wastewater that is not treated or managed correctly can create potential public health and safety problems (DNREC must regulate the source of reclaimed water).
2. Wastewater continuously generated throughout the year, while the demand for irrigation water is seasonal (requires that source of reclaimed water must have storage capacity or other discharge options).
3. Municipality or private utility must make investment in land (purchase or lease) and equipment (spray irrigation equipment).
4. Treated reclaimed water from each municipal treatment facility and wastewater utility has its own chemical make up (DNREC must scrutinize municipal and private permits for

wastewater disposal). When this wastewater is used for agricultural irrigation, care must be given to protect the health of the public and the soil and consistent with approved nutrient plans.

Regulations

Current regulations allow for the application of reclaimed water onto farmers' fields through a DNREC public permit process. Guidance and Regulations Governing the Land Treatment of Wastes (Regulations) are currently under review by DNREC and will by undergoing revisions within the next 18-24 months.

This regulatory review process will allow the opportunity to update and address any limitations or prohibitions in the current regulations to more readily allow farmers the ability to utilize reclaimed wastewater.

Recommendations

1. The task force recommends that the State of Delaware explore ways provide incentives including utilizing existing funding sources that are available to any wastewater entity that will cease discharging effluent into surface waters and instead divert reclaimed wastewater to farmers' fields.

2. The task force recommends that all wastewater entities recycling reclaimed water to agricultural lands be required to do so under an agronomic plan.
3. The task force recommends that wastewater entities that enter into lease agreements with farmers to recycle reclaimed water on farmland provide reasonable economic lease terms dictated by the market that will enable farmers to get a reasonable return on the equity in their agricultural lands.
4. The task force recommends that the findings of the task force be utilized to benefit all agricultural lands including farmlands that are under agricultural preservation.
5. The task force recommends that any and all state and DNREC regulations regarding the recycling of reclaimed water to farmland be implemented upon the wastewater entity, and not the farmer.