

**Water Resources Board
Water Allocation Program Advisory Committee**

**Integrated Water/Wastewater Committee
Final Report, Findings and Recommendations
December 4, 2003**

Committee Members

Juan Mariscal, Chair, Narragansett Bay Commission
Lydia Vincent, Co-Chair, Atlantic States Rural Water & Wastewater
Howard Cohen, RI Economic Development Corp.
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Warren Towne, RI Department of Environmental Management
Kathleen Esposito, Brown University
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Jay Cummisskey, RI Golf Course Superintendents Association
Michael DiPrete, Irrigation Association of RI
Vicky Drew, Natural Resources Conservation Service
Chris Feeney, Louis Berger, Inc.
Steve Goslee, Jamestown Water
Susanne Greschner, Rhode Island Public Expenditures Council
Anthony Sylvia, City of Newport
Thomas Uva, Narragansett Bay Commission
Peter Vetter, Applied Water Management, Inc.
Skip Viator, University of Rhode Island Civil & Environmental Engineering Department

**Water Allocation Program
Integrated Water/Wastewater Sub-Committee**

Memorandum

Date December 4, 2003
To: Water Allocation Program Advisory Committee
From: Juan Mariscal, P. E.
 Chair, Wastewater/Water Sub-Committee
Subject Final Report and Recommendations

This report is presented on behalf of the Wastewater/Water Sub-Committee. The Sub-Committee met in October and November to review the report and its findings and recommendations. At its meeting on November 13, 2003, the committee made final adjustments and reached a consensus. Following that meeting, additional comments were received on the printed report. This report and its findings and recommendations reflect the Sub-Committee's consensus and comments received.

Background

The initial focus of the Integrated Wastewater Water Sub-Committee was to identify opportunities to supplement the state's water supply by providing a "NEW" source of water, i.e. Nutrient Enriched Water – the effluent from publicly owned wastewater treatment facilities. This focus widened by including discussions and consideration of the reuse and recycling opportunities for storm water, industrial process water and so-called greywater (i.e. water from sinks, showers, etc.).

The Sub-Committee began its deliberations with presentations by representatives from the Jamestown and Cranston Wastewater Treatment Facilities. The Jamestown WWTF has a successful project where a substantive portion of their treated effluent is reused on a seasonal basis at the Jamestown municipal golf course. The Cranston project involves the reuse of its effluent as cooling water for a power plant in Johnston. At this meeting, in addition to committee members, were wastewater treatment facility operators and pretreatment coordinators from around the state that we had invited.

At later meetings, the committee discussed other possibilities for the reuse of effluent, including: use at other golf courses, other power plants, nurseries, tree farms, turf farms, etc. In addition, to exploring opportunities, the committee was also concerned about impediments or requirements imposed by legislation, regulations and building codes. Committee members completed some research. Geographic factors and proximity of source of the water and the possible users were also outlined.

Our initial thinking was that that demonstration projects were necessary to prove that these reuse and recycling projects were practical and implementable, especially in Rhode Island. We tried to identify several types of demonstration projects to prove that these types of water reuse projects could actually be a substantive attractive supplement to existing water supplies. Discussions about some possible demonstration projects were initiated. A meeting was conducted with some possible participants for an Aquidneck Island project involving the reuse of wastewater on nursery (non-food chain) crops. At this time, this demonstration project has not been fully defined or scheduled.

In addition, the committee heard a presentation from Applied Water Management (<http://www.appliedwaterne.com>) on its projects at Gillette Stadium and Wrentham Village Outlet mall where wastewater recycling systems are functioning at present. These projects recycle used water for toilet flushing purposes. This company also noted that they have many successful recycling projects throughout New England. Narragansett Bay Commission staff (NBC) and I visited recently a renovated mill building in Providence where a “green roof” is planned for installation in the Spring 2004. Also, as part of a sewer connection permit application to the Narragansett Bay Commission, I learned that a major public project in Providence is also proposing to install a green roof as part of the renovation of an historic building. These green roofs are designed to take stormwater from the roofs and use it for toilet and urinal flushing, lawn watering and/or roof top gardens or green space. These systems typically include the use of a storage tank and pump that then distributes the recycled water on an as needed basis. A green roofs workshop was held in Providence recently that some IWW Sub-committee members and I attended. A quick search of the internet (<http://www.greenroofs.com>) shows that “green roofs” are gaining considerable interest and are being used for various reasons, including aesthetics, water conservation and reuse. At the recent green roofs workshop, it was noted that in Germany about 15% of all new and renovated flat roof buildings incorporate the green roof concept.

There are many other recycle and reuse projects in operation in Rhode Island at present. RIPTA presently uses a water recycling system for its bus washing operations that results in about 90% reuse of the water. Other commercial car washes also use recycling systems. Large commercial laundries have also implemented major recycling systems. One operation in the NBC district has recently put into operation a system that saves about 100,000 gallons of water a day. Many other industries throughout Rhode Island have incorporated water recycling into their operations.

Recently, NBC staff and I visited a Pawtucket manufacturing company that is pursuing recycling of their process water for use on the company grounds (lawn, bushes, flowers). While this system will result in a minor amount of water being recycled, the company pursued this opportunity to reduce sewer discharge permit fees. Many other companies in the NBC district (and around the state) have been successfully using recycling and reuse systems for many years. As part of efforts to comply with wastewater pretreatment requirements there are a number of manufacturing facilities that have so-called “zero discharge” systems, i.e. treatment systems that result in an effluent that can be completely reuse in the manufacturing operations so that there is no discharge to the sewer system.

Finally, as part of the NBC's CSO abatement project, an evaluation is underway in a neighborhood on separating roof drains from the sanitary sewer system. In some cases, consideration is being given to re-directing the roof drains where possible to provide irrigation of lawns or gardens. In at least one home, the owner has installed rain barrels with pumps to store and then reuse the water when needed on lawns, gardens and other yard plantings.

There appears to be a growing number of recycle and reuse systems in the state proving the feasibility and attractiveness of this opportunity. In order to encourage additional development of these types of beneficial projects, the Sub-Committee believes that the potential for this future water supply source should be acknowledged, encouraged and promoted with new incentives and the removal of any "disincentives" that may exist. Additional demonstration projects coupled with educational efforts would also be worthwhile.

The major question is: What is needed to encourage more of these types of projects? Other questions include: Are changes in legislation, regulations or building codes needed? Are financial and other incentives needed? Can reuse and recycle projects provide a substantive portion of the state's future water supply needs? How costly is it to implement a water reuse/recycle system?

The Sub-Committee does not believe there are any major technical or other impediments to water reuse or recycling in Rhode Island. However, some issues need to be addressed to implement a higher level of recycling and reuse of water in Rhode Island. These issues include: (a) education (for developers, public officials, users, etc. and regarding benefits, technology, etc); (b) establishment of requirements for reuse and recycling (possible mandates); and (c) creation of incentives (monetary or other).

Some members of this Subcommittee may assist and/or serve on the Special Senate Commission to Study Wastewater Reclamation and Reuse in Rhode Island. This Commission was created in the Senate on July 2, 2003. It will begin its activities soon. Recommendations from this Commission are due to the General Assembly in March, 2004. The recommendations from the WAPAC Integrated Water and Wastewater Sub-Committee will provide Senator Sosnowski, the chairperson, a framework for further study and implementation of a water/wastewater reuse and recycling program that enhances future water availability prospects for the people of Rhode Island.

Findings and recommendations

Priority Recommendations:

- The reclamation, reuse, and/or recycling of wastewater and water (including stormwater, greywater industrial process water and other used waters) for beneficial reuse should be incorporated in the state's overall water strategy as a viable, substantive, alternative water source to public and private surface and

groundwater sources. (At present State Guide Plan Element 721 has only a minor reference to the encouragement of the reuse of water, where feasible.) Implementation and promotion of wastewater and water reuse options can be accomplished through a combination of mandatory water conservation requirements and incentives to augment existing water supplies. (No financial impact, other than the cost of staff time and meetings)

- A preliminary outreach project should be established that educates the general public, public and regulatory officials, developers and existing water users of the importance and benefits of reclaiming wastewater for beneficial reuse. Public perception is a vital component of a successful reuse program. Many excellent resources exist that detail the promotion of reuse programs that can be tailored for use and distribution in Rhode Island to address possible public health concerns. (An initial allocation of \$50,000 for program development and a two-year trial implementation)
- The RI Department of Environmental Management (DEM) draft Guidelines for Wastewater Reclamation and Reuse should be finalized. All public agencies should work together with DEM to coordinate their activities to determine which agencies have specific authority over such projects and what approvals would be required from each agency. The intent of this coordinated effort is to define the lead agency in permitting such projects and to eliminate any “disincentives” that may exist for these projects to be permitted and implemented. These guidelines and the development of a framework for the coordinated review and approval of future reuse proposals should be implemented by appropriate state agencies such as the RI Department of Health (DOH), the Water Resources Board, and Statewide Planning, in conjunction with DEM. (No financial impact for finalizing guidelines and coordination between staff agencies other than staff time. However, for implementation, additional resources will be required to ensure compliance with minimum requirements through inspection and monitoring. The extent of the effort and the cost will depend on the scope and number of reuse projects that are approved and implemented.)
- Legislation and/or regulations should be considered for all new residential, commercial and industrial projects in the State exceeding a certain water use or wastewater treatment threshold. This legislation and/or regulations would require a developer to submit a water use plan that evaluates and determines the feasibility of reuse and recycle systems for the proposed project. The development proposal/plan should evaluate the feasibility of wastewater reclamation and reuse as part of a water conservation plan to reduce or offset the impact of the development. In addition, this requirement should be incorporated into the Rhode Island Comprehensive Planning provisions and into local planning and zoning ordinances. Individual projects would be reviewed for consistency by the appropriate local officials. (No financial impact other than staff time to draft legislation; unknown impact for amendment to local comprehensive plans and the review and approval of plans at the local level)

Other Recommendations

- Pilot or demonstration projects can be used to showcase and monitor reuse and recycle systems. The State should assert leadership in this regard and install water/wastewater reuse systems at public lands and projects including high profile public-private partnerships. Where state and/or federal funding is provided for a public or private project, a feasibility study to incorporate water reuse concepts, designs and projects should be required as part of the funding application. Joint projects by state, federal, private and academic groups should be encouraged. (Possibly implementation through an Executive Order and/or legislation)
- Water Suppliers should promote wastewater reclamation and reuse as a guaranteed water source for all new and existing users. Water Suppliers should also concentrate promotion of reuse through the Major Users Technical Assistance Program (MUTAP) required by the Water Resources Board. A "Strategies for Wastewater Reuse" section exists in the State Guide Plan that can be enhanced through the MUTAP process. Reuse efforts should be concentrated at the state-owned and/or managed properties. These agencies, for example, have considerable land at which opportunities could be explored: Department of Administration, Department of Environmental Management, Economic Development Corporation and the Department of Mental Health, Retardation and Hospitals. (Presently required by MUTAP; additional efforts to be encouraged by RIWRB)
- In addition to mandating a reuse feasibility study, the legislation recommended earlier may provide incentives (via sales tax credits, expedited permit reviews, etc.) for reuse projects. Existing pollution control and/or prevention sales tax credit legislation may already address this need. These incentives would serve the dual purpose of encouraging water conservation through reuse as well as informing stakeholders that reuse is an accepted practice in Rhode Island. (The model water code addresses this as well) (Review of existing legislation needed)
- A centralized information and education source to both private developers and to the cities and towns in RI on water reuse and recycle systems will be necessary to ensure that information on reuse is standardized and consistent. Educational brochures, workshops, and marketing of reuse systems should be part of the agency's responsibilities.
- Further research into wastewater reclamation and reuse is necessary to address possible public and environmental health concerns. Reuse projects should be monitored and inspected for compliance and a database of reuse projects should be maintained by the responsible agency. (Additional resources will be required to ensure compliance with minimum requirements through inspection and monitoring. The extent of the effort and the cost will depend on the scope and number of reuse projects that are approved and implemented.)