

# NEW JERSEY FLOWS

New Jersey Water Resources Research Institute

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## Navigating the NJDEP Reclaimed Water for Beneficial Reuse Program

*Jim Grob, Bureau of Compliance & Enforcement, NJDEP*

### Features

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1 On June 21, 2001, the New Jersey Department of Environmental Protection (NJDEP) issued a permit authorization to the Evesham Municipal Utilities Authority for implementation of Reclaimed Water for Beneficial Reuse (RWBR) at their Evesham Elmwood Wastewater Treatment Plant. The permit authorization permitted the distribution of RWBR to the nearby Indian Springs Golf Course for the purpose of irrigation. This was the first permitted RWBR project in the State of New Jersey. Since then, 30 additional wastewater treatment facilities have been provided with NJDEP RWBR authorization, 13 of which now have operational RWBR projects. In calendar year 2006, over 2 billion gallons of water were reused through this program. Additionally, the RWBR program issued a restricted access RWBR general permit, effective June 1, 2006, which expedites the implementation of RWBR for certain applications where exposure to the general public is restricted.

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5 In 2004, \$35 million in funding was made available through NJDEP for Innovative Water Supply/Reuse Demonstration Projects. These funds are helping 12 additional RWBR projects to move forward.

6 As reclaimed water projects in New Jersey continue to grow in scope and complexity, the RWBR program within NJDEP is faced with increasing challenges. The program functions with a volunteer "Reuse Task Force" comprised of representatives from various permit and planning program areas. Each Task Force member has program area work priorities, as well as RWBR responsibilities. The Reuse Task Force has issued a Reclaimed Water for Beneficial Reuse Technical Manual (updated January 2005; available through the Department's web page) that provides general information on permitting requirements and RWBR implementation. Because RWBR projects can involve many program areas, regulatory hurdles may occur when it comes to RWBR implementation at a specific site. Below are some of the regulatory programs that may need to participate when developing a RWBR project.

7  
8 RWBR is implemented through the New Jersey Pollutant Discharge Elimination System (NJPDES) permitting program. All facilities that dispose of wastewater in the State are required to obtain authorization through a NJPDES permit. When a permittee wishes to implement RWBR, the permit is modified to include conditions/requirements applicable to the type of RWBR being requested. If additional treatment is needed to achieve RWBR quality criteria, or if additional infrastructure is needed to convey reclaimed water to a reuse site, a Treatment Works Approval (TWA) is also necessary.

Many RWBR projects require changes to the existing Water Quality Management Plan (WQMP) for the location in which the RWBR project is planned. This may be as simple as a "revision" to the WQMP. A WQMP plan "amendment" may be required where a new wastewater treatment plant is proposed at the reuse site to provide additional treatment prior to RWBR application. A plan amendment may also be required where a new development is proposed which incorporates a RWBR component. Draft rules are being prepared to clarify when revisions or amendments will be required.

RWBR projects may also be required to obtain a land use permit for construction of the conveyance/distribution system in addition to the TWA permit. CAFRA, Freshwater Wet-



**Reuse It New Jersey!**

### *The Director's Chair*

Joan G. Ehrenfeld, Ph.D

At a time of ever-decreasing supplies of fresh water, the re-use of treated wastewater, particularly for purposes other than drinking water, is attracting a lot of attention. Improvements in treatment technologies make such waters a potentially realistic and valuable resource. While there are many challenges to widely adopting and implementing re-use programs, this is a subject that urgently demands the attention of New Jersey's concerned citizens. We present here a series of articles exploring this important subject.

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# Impacts to Wetlands from Beneficial Re-Use of Wastewater

*Gina Berg, Burlington County Dept. of Resource Conservation*

In March 2006, the Burlington County Board of Chosen Freeholders through the Water Resources Program completed a project funded by a Wetlands Program Development Grant from the United States Environmental Protection Agency Region II. The project was intended to evaluate the potential for impacts to nearby wetlands due to the use of treated wastewater effluent for irrigation on adjacent uplands. The project had three components. The components included field sampling, modeling, and finally, developing a re-use plan for the County of Burlington with the goal of avoiding impacts to wetlands that may have been found through sampling and modeling. The project evaluated chemistry, but did not consider mounding or hydrology impacts.

Water supply issues are becoming more urgent here, as they are in many other areas. Increasing population and other factors have strained a primary water supply aquifer, the Potomac Raritan Magothy, such that steps had to be taken to prevent further salt water intrusion. The initial step taken by the State of New Jersey was to declare a Critical Water Area. Within the Critical Water Area, withdrawals are capped. Those statutory limits are not projected to meet all future needs within the Critical Water Area in Burlington County based on a separate study undertaken by the Burlington County Department of Resource Conservation. Burlington County supports and promotes the continuation of agriculture as a viable business. To remain viable, farming requires cheap and readily available water supplies. Therefore, it is important that we seek alternative sources of water to meet the needs of farming and other growth. The re-use of treated effluent for irrigation had to be considered as one alternative source.

For the first task of this project, we worked with Dr. Kauser Jahan of Rowan University whose team characterized “typical”



*Continued from Page 1*

lands, Stream Encroachment and other land use permits must be evaluated in conjunction with the overall RWBR project requirements to avoid permitting delays.

There are several types of RWBR projects that initially may have no direct connection to the regional wastewater treatment facility that services the project area. Typically, these RWBR projects involve Water Use Registrations or Water Allocation Permits and the desire of obtaining an additional water supply. One of the first steps in such projects is to meet with the regional wastewater facility representative, because any RWBR authorization will have to be through the wastewater treatment facility’s NJPDES permit. Once a partnership for RWBR is formed, it is recommended to reach out to the public to address any of their concerns and to scope out any potentially controversial issues that may hinder the process. A RWBR

treated effluent, monitored wetlands and analyzed water quality from wetlands. For the second task, impacts modeling, we contracted Alaimo Associates of Mount Holly. The impact model was intended to predict where the potential for environmental impacts is lowest. The outcome of the first two tasks was to provide information important to the final development of a re-use plan.

This project incompletely addressed the original scope of work; yet, it provided important information towards our goal of

assessing impacts to wetlands from the re-use of treated effluent for irrigation purposes. From Phase I, the field sampling clearly indicated that re-use on golf courses in this region has negligible impact on wetlands as compared with standard turf management practices. From Phase II, the attempt to model potential impacts educated us on the difficulty of creating a model that could address both environmental factors as well as land use factors. Land management factors, such as goose control, may have a greater impact than environmental factors, but would be extremely

difficult to reliably forecast on a regional basis rather than a site-by-site basis. Thus any modeling effort based on environmental factors could be rendered moot by individual site management. From Phase III, the County wide model was not possible based on the tools and information we found.

While we want to find alternatives to water supply for growth and agriculture, residents of Burlington County also support the protection and preservation of open space and natural areas. The Department of Resource Conservation implements programs to further the goals of open space preservation and protection. Protecting wetlands within our preserved lands is a part of that effort.

*Gina Berg is Water Resources Coordinator for Burlington County Department of Resource Conservation, [www.co.burlington.nj.us](http://www.co.burlington.nj.us).*

“User/Supplier Agreement” and “Operations Protocol” are administrative components that are required as part of the authorization process through the NJPDES permit.

NJDEP is encouraging RWBR implementation throughout the State. RWBR makes sense in light of the increased water supply demands and recent history of drought conditions. However, RWBR is still a relatively new program within NJDEP, and consequently new concept/implementation issues might arise that have not been dealt with previously. Therefore, it is recommended that you establish and maintain contact with the Reuse Task Force members and communicate throughout the RWBR project permitting and implementation process. Contact information for the Reuse Task Force members and program information, including access to the RWBR Technical Manual, can be found at [www.state.nj.us/dep/dwq/reuseff.htm](http://www.state.nj.us/dep/dwq/reuseff.htm).

*Jim Grob is a member of the Reclaimed Water for Beneficial Reuse Task Force.*

## Clean Ocean Action: Recommendations for New Jersey's Water Reuse Program

Jennifer Samson, Ph. D., *Clean Ocean Action*

Historically, water reuse has not been a common practice in New Jersey. Most of the state's wastewater effluent was discharged into its 6,450 miles of rivers, along its 120 miles of Atlantic coastline, or to other water bodies. It was not until the drought of 1999 and the subsequent drought of 2002, when New Jersey faced severe water supply problems, that the benefits of conserving and reusing water were apparent. The droughts drained New Jersey's water supply to dangerously low levels. As a result, Governor Christie Todd Whitman declared a state of water emergency in August 1999. When similar conditions existed in 2002, Governor James McGreevey declared another state of water emergency in March. The drought restrictions set forth by the New Jersey Department of Environmental Protection (NJDEP) during the water emergency periods limited public and private uses of water, except for people who used non-potable water, making reuse a very desirable option.

During the drought of 2002, NJDEP Commissioner Bradley M. Campbell issued Administrative Order 2002-21, which authorized the "revision of the mandatory water use restrictions, and... certain uses and discharges of treated wastewater... to ensure an adequate water supply to the State, to alleviate the water emergency and to be in the public interest." This order allowed domestic wastewater treatment facilities, with no prior approval for reuse in their New Jersey Pollutant Discharge Elimination System (NJPDES) permit, to begin planning beneficial reuse programs after receiving written approval from NJDEP. Water reuse was approved for restricted access applications – street sweeping and irrigation of non-food crops, golf courses, and select landscaping beds – as long as the system met the facility's current NJPDES permit requirements and did not negatively impact a water body's base flow or uses downstream. Approximately 75 wastewater treatment facilities were granted approval for beneficial reuse programs through the drought emergency order from August 2002 to January 2003.

New Jersey's guidelines for water reuse are contained in NJDEP's *Technical Manual for Reclaimed Water for Beneficial Reuse*. The manual was initially developed in the early 1990s and was updated in January 2005. It provides recommended system design and water quality limits for four main water reuse applications: public access; restricted access and non-edible crops; agricultural edible crops; and industrial, maintenance, and construction. However, the manual is only a guideline for reuse programs as it currently lacks regulatory backing.

Unlike other states with flourishing water reuse programs, New Jersey has not clearly identified the promotion of reclaimed water reuse as a state objective. NJDEP's authority to develop and advance a water reuse program stems from the agency's current interpretation of existing water management objectives, which state:

*The Legislature finds that the people of the State have a paramount interest in the restoration, maintenance and preservation of the quality of the waters of the State for the protection and preservation of public health and welfare, food supplies, public water supplies, propagation of fish and wildlife, agricultural and industrial uses, aesthetic satisfaction, recreation, and other beneficial uses...*

NJDEP plans to introduce several amendments to the NJPDES Rule (N.J.A.C. 7:14A-2.15) that will establish permit conditions for facilities that plan to divert water for beneficial reuse, as well as define and describe different Reuse Classifications and establish Reuse Feasibility Study requirements. The state has supported water reuse, usually as a response to droughts, in the Water Supply Action Plan. The Plan examines all aspects of water supply management by providing an analysis of the state's water resources; current and projected supply and demand; guidelines for ways to conserve, protect, and manage water supplies; and evaluations of projects to meet the state's need.

In fact, in response to the droughts that plagued New Jersey in 2001-2002, NJDEP has developed the Water Supply Action Plan 2003-04. In doing so, NJDEP revised the Statewide Water Supply Plan, stating that "[b]ased on the lessons learned during this [2003] and previous drought events, DEP has prepared the 'Water Supply Action Plan 2003-04,' a policy program that identifies key initiatives which aim to maximize clean and plentiful water Statewide." NJDEP included in the initiatives "the need to promote Beneficial Reuse of Reclaimed Water and the adoption of mandatory conservation measures, where appropriate," reasoning that "[e]xpediting these measures will help safeguard the State against future drought emergencies and provide critical information in support of the comprehensive Statewide Water Supply Plan." The Plan is undergoing another major update and is expected to be complete in 2007. Currently, the Water Supply Action Plan 2003-04 identifies 11 key actions the state can do immediately to enhance the quality and quantity of New Jersey's water supply before the updated Water Supply Plan is complete. Action Nine is the advancement of the beneficial reuse of water by developing strategies to overcome the higher costs associated with water reuse programs.

After reviewing New Jersey's water reuse efforts, it is clear that they are based on a patchwork of policies issued at times of crisis rather than a true regulatory program. Thus, Clean Ocean Action offers the following recommendations to NJDEP. By implementing these recommendations, New Jersey can begin to establish a comprehensive water reuse program.

1. Establish a legitimate Beneficial Reuse of Reclaimed Water Program, which incorporates the Vision Statement below. The current "Wastewater Reuse Program" is a taskforce made up of NJDEP staff members from several different regulatory programs. The participating members are asked to implement, promote and advance wastewater reuse projects, in addition to their full time job responsibilities. The establishment of an official Program with a dedicated director and staff is critical for adequate oversight and administration of environmentally sound water reuse activities. Both the Program and its Vision Statement must encompass a goal to restore and enhance New Jersey's watersheds and to protect the aquatic integrity of New Jersey's groundwater, surface water, and wetland habitats for future generations. In following the Vision, the Program should seek ways to eliminate salt-water intrusion, sustain adequate levels of drinking water, and maintain historic levels of water in bays, creeks, and wetlands. Only if the Vision is accomplished, should the reused water be used to accommodate developmental expansion.

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## Pinelands Commission to Study Impacts of Reclaimed Water Reuse

*Ed Wengrowski, New Jersey Pinelands Commission*

The Pinelands Commission is working with NJDEP's Division of Water Quality to foster beneficial reuse of treated wastewater in certain regions of the Pinelands while implementing a monitoring program to safeguard against the potential mobility of wastewater constituents. An Intergovernmental Memorandum of Agreement is being developed to establish a Pinelands Beneficial Reuse Pilot Program.

Since its inception in 1979, the Commission has worked to preserve, protect and enhance the region's natural resources, including the 17.7 trillion gallon Kirkwood Cohansey aquifer. In many areas of the Pinelands, the ground water table lies just below the surface of the mostly sandy Pinelands soils. Moreover, throughout the one-million acre Pinelands Area, the Kirkwood Cohansey ground waters outcrop from below the land surface to "feed" freshwater wetlands and emerge as base flow to the numerous Pinelands creeks, streams, and rivers. As an unconfined geologic unit or water table aquifer, the Kirkwood Cohansey is particularly vulnerable to contamination.

To meet its charge to preserve and protect this resource, the Commission employs a number of stringent land use controls and water quality programs embodied in the Commission's Pinelands Comprehensive Management Plan (CMP). (N.J.A.C. 7:50 et seq.) One important provision of the CMP is a requirement that stormwater runoff be recharged to the aquifer to help maintain ground water levels. Another important requirement is that treated wastewater is not discharged to surface water bodies, but instead is recharged to the subsurface within specific land use management areas of the Pinelands.

Under existing Pinelands land use regulations and the New Jersey Pollutant Discharge Elimination System (NJPDES) program, the use of treated wastewater (a.k.a. reclaimed water) may be approved for turf and landscape irrigation in the more highly developed areas of the Pinelands including the Pinelands Regional Growth Areas, Pinelands Towns, Pinelands Villages and the developed portions of Military and Federal Installation Areas. However, the installation of centralized wastewater infrastructure, including infrastructure to treat, convey and apply treated wastewater is not permitted under existing Pinelands regulations in the more ecologically sensitive Pinelands Rural



Golf courses in the Pinelands Rural Development Area would monitor surface and ground water for wastewater pollutant mobility markers as a requirement of the Pinelands Beneficial Reuse Pilot Program.

Development Areas (RDA), Agricultural and Special Agricultural Areas, Forest Areas and Preservation Districts.

Recognizing that expanded opportunities for beneficial reuse could further the Commission's water preservation goals, the Pinelands Commission is developing a Intergovernmental Memorandum of Agreement (MOA) with NJDEP and is simultaneously developing amendments to the CMP to establish a pilot program for the beneficial reuse of treated wastewater at a limited number of existing golf courses in the Pinelands RDA. It is currently envisioned that beneficial reuse would commence through the pilot program and the NJPDES permitting process.

Beneficial reuse would be authorized at up to six existing golf courses in the Pinelands RDA. These golf courses would be permitted to use treated wastewater for turf and landscape irrigation instead of their current use of potable sources. To participate, the golf courses will be required to monitor surface and ground water for the presence of select wastewater pollutant mobility markers. In addition, the golf courses will need to demonstrate that the use of reclaimed water has resulted in the conservation of potable water supplies.

While the Commission recognizes the potential benefits of wastewater reuse, there is some concern with the potential mobility of certain wastewater pollutants, sometimes referred to as emerging contaminants, and consisting of pharmaceuticals, hormones, personal care products and other organic contaminants. The MOA and pilot program will provide the Commission with the ability to monitor the environment at the reuse sites for adverse impacts associated with land applications of treated wastewater. If adverse impacts are detected, the

Commission could require additional treatment or require the reuse activity to be terminated. If the Commission determines that pollutant mobility is not a problem, they may consider allowing beneficial reuse at additional sites. Currently, the Commission has not expressed an interest in permitting beneficial reuse in the Agricultural, Special Agricultural, Forest and Preservation Management Areas of the Pinelands.



*Ed Wengrowski is Wastewater Management Coordinator for the New Jersey Pinelands Commission, [www.state.nj.us/pinelands/](http://www.state.nj.us/pinelands/).*

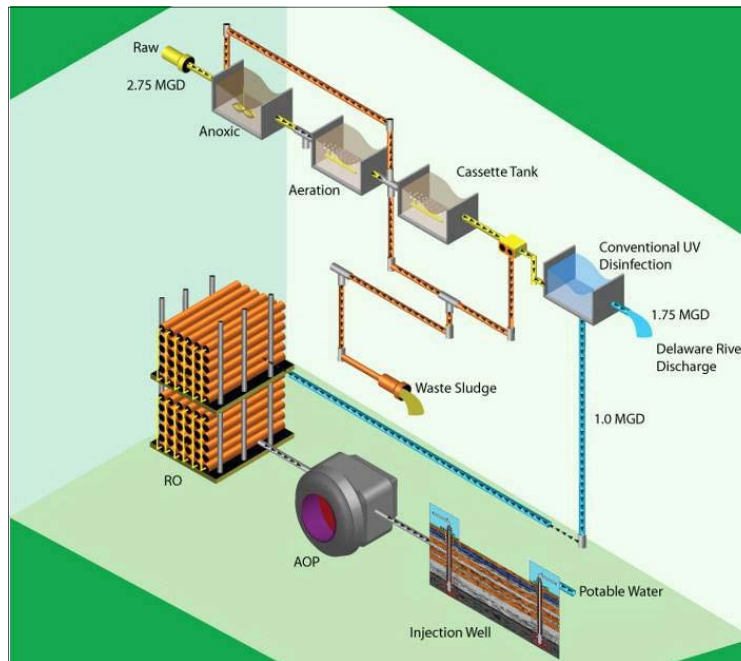
## Water Reclamation: A Groundwater Replenishment Demonstration Pilot in Logan Township

Kathleen Esposito, Tim Bradley, Joe Weber & Gary Whalen

After the record-breaking drought of 2002, the New Jersey Department of Environmental Protection (NJDEP) recognized the need for proactive and innovative steps to safeguard the state's water supplies. As a result, NJDEP requested proposals for projects to supplement NJ's water resources through water reuse. Due to increasing pressures on potable water resources in its service area, Logan Township Municipal Utilities Authority (LTMUA) worked with Metcalf & Eddy to develop a proposal to design a groundwater recharge system via direct injection based on an upgrade at the existing wastewater treatment plant. The additional volume of water will replenish an aquifer system that is the primary potable water source for the region. This project was awarded a NJDEP Demonstration Grant and, upon final NJDEP approval, will be the first indirect potable reuse project (IPR) in the northeastern U.S.

Wastwaters being treated for IPR are subject to the same stringent regulations and monitoring requirements as conventional potable water sources. The treatment train for the planned groundwater replenishment system represents the state-of-the-art for IPR technology. It consists of membrane bioreactors (MBR), which provide a high sludge age and a physical barrier to microbes and organics; reverse osmosis (RO), to remove dissolved contaminants and provide a second microbial barrier; and an advanced oxidation process (AOP), where hydrogen peroxide is combined with ultra violet (UV) light to provide final disinfection as well as oxidation of any ultra-low molecular weight organics.

The proposed treatment train was pilot tested at LTMUA



Flow Schematic of the Pilot System Process

from August through November 2005 to confirm performance and design criteria, and to build operator understanding of the proposed processes. In addition to monitoring for conventional water quality indicators, extensive sampling was conducted for a wide range of regulated and unregulated contaminants that can be found in drinking water supplies.

Analysis for detection of regulated contaminants listed in EPA's Primary and Secondary Drinking Water Regulations and NJDEP's Testing Requirements for Organic Toxic Pollutants for Discharges to Groundwater indicated very effective treatment. For these tests, all but eight parameters were undetected in the RO treated water. The parameters that were detected were well below their respective maximum contaminant level, if established.

In partnership with the US Geological Survey, samples were also analyzed for unregulated compounds that have been detected at trace levels in water sources across the country. These compounds of emerging concern (CECs) include a wide range of household and industrial chemicals such as pharmaceuticals and personal care products. No compounds were detected in the treated water from the AOP unit.

Overall testing showed that the quality of the finished water from the pilot unit was comparable to that of the aquifer water. The experience and knowledge gained from this novel pilot study can be an example for other water reclamation and reuse projects, particularly for IPR projects, across the country.

*Kathleen Esposito is Technical Specialist and Tim Bradley is Vice President for Metcalf & Eddy, [www.m-e.aecom.com](http://www.m-e.aecom.com). Joe Weber is Superintendent and Gary Whalen is Executive Director for Logan Township Municipal Utilities Authority, [www.logan-twp.org](http://www.logan-twp.org).*

*Continued from Page 3*

Vision Statement: Beneficial reuse of wastewater will restore, improve, and protect the aquatic integrity of New Jersey's groundwater, surface water, and wetland habitats; it will efficiently and effectively conserve water, reduce saltwater intrusion, and sustain a healthy supply of groundwater.

2. Appoint a Water Reuse Program Director to work on water reuse and spearhead the program. Currently, the Chief of the Region 1 Bureau of Point Source Permitting coordinates the taskforce that oversees water reuse projects, which includes 31 facilities permitted to divert over 1.7 billion gallons of wastewater to various reuse activities. Although NJDEP resources are limited, it is imperative to appoint a Program Director who can devote the time and effort necessary to review and manage the ever-increasing number of water reuse projects. The Program

Director would also facilitate coordination among various agencies and divisions within NJDEP that are responsible for different aspects of the program. We also suggest that reuse staff and regional employees working with water reuse issues are properly educated on the subject, aware of the program's goals, and exchange information. A water reuse educational program for staff would be one way to fulfill this recommendation.

3. Promulgate regulations to support and enforce effective water reuse policies consistent with the Vision Statement above, as well as state and federal water quality standards.

New Jersey can set the stage for a strong and vital water reuse program by learning from the successes and challenges of other states. A true program begins with a clear Vision Statement, a Program Director, and a formal regulatory structure.

*Jennifer Samson is Principal Scientist for Clean Ocean Action, [www.cleanoceanaction.org](http://www.cleanoceanaction.org). Based on a report by COA intern Lauren Koch.*

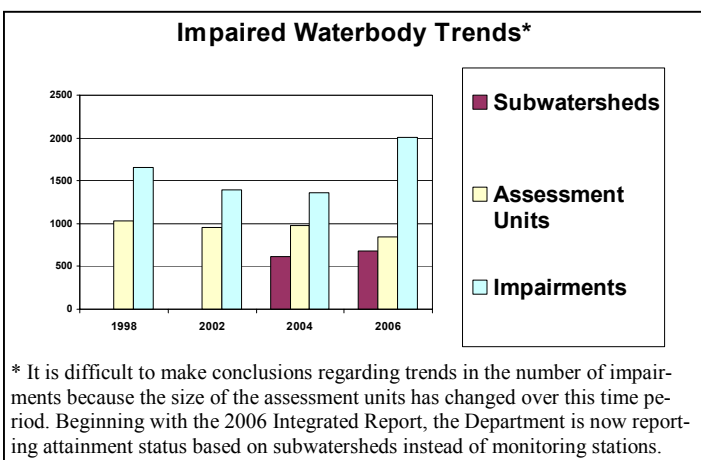
## 2006 Statewide Water Quality Report Recently Issued by NJDEP

### Most Complete Assessment of New Jersey's Water Quality To-Date

*Alena Baldwin-Brown, Water Monitoring and Standards, NJDEP*

The 2006 Integrated Water Quality Monitoring Assessment Report, released recently by the NJ Department of Environmental Protection (NJDEP), is the most complete assessment to date of the state's water quality, providing detailed information obtained from expanded NJDEP monitoring and the use of high quality non-agency data. While results show progress in reducing some pollutants, many of the state's waters are not meeting water quality goals.

New Jersey has an abundance of water resources, with 127 miles of coastline, over 18,000 miles of rivers and streams, and hundreds of acres of lakes, ponds and marshes. For this report, NJDEP evaluated waters based on their ability to support seven categories of designated uses: aquatic life, recreation, drinking water supply, fish consumption, shellfish harvest, industrial



water supply and agricultural water supply. Waters that do not meet current water quality standards for these uses are considered impaired, meaning that they are impacted by some level of pollution.

Despite the Department's use of more water monitoring data than ever before, only 9% of the state's waters could be fully assessed for all potential uses. Data were available, however, to evaluate at least one water use in over 90% of the state's waters. Of the evaluated waters, over 70% are still impaired for one or more uses, while 10% of waters in the state are known to support all potential water uses. Many waters are not meeting NJDEP's water quality goals for aquatic life, fish consumption and freshwater recreational uses. However, most waters in the state are healthy enough to support drinking water supply, shellfish harvesting, and ocean beach recreational uses.

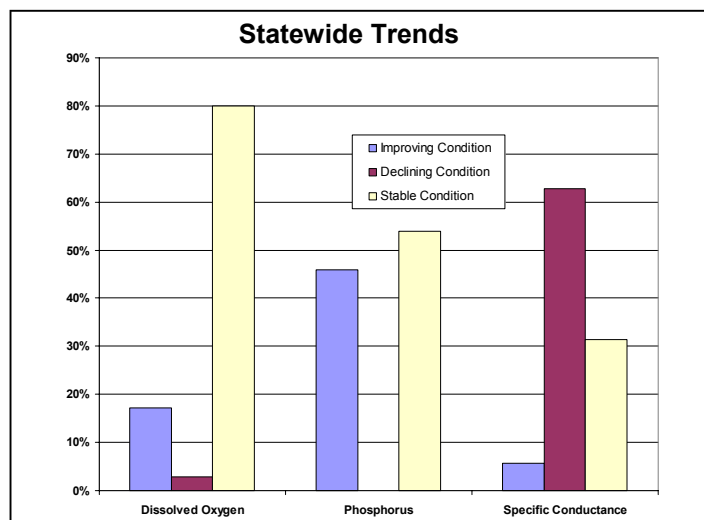
The primary pollutants affecting New Jersey's water quality include toxic contaminants, mercury and PCBs (polychlorinated biphenyls) in fish tissue, phosphorus (a nutrient) in freshwaters,

and disease-causing microbes (or pathogens) in our rivers, lakes and coastal waters. As evidence of a positive trend, monitoring data show that between 1985 and 2004, nutrient concentration (s) and dissolved oxygen levels in freshwaters have improved or remained stable throughout the state. The levels of these water quality indicators are particularly important in sustaining healthy aquatic life. The report also evaluates impacts from stormwater runoff, spills, improperly treated wastewater, and atmospheric deposition of pollutants from local, regional and national sources. Non-point source pollution, referring to contamination occurring from a wide variety of sources including pets, livestock, stormwater discharges, and fertilizers, is responsible for a significant portion of the water quality problems identified in the report.

The report also contains the list of impaired waters in the state, sometimes referred to as the "303(d) list," named after the section of the Federal Clean Water Act in which it appears. Federal law mandates that states develop thresholds and limits to reduce the contaminant load in waterbodies that are impaired. NJDEP updates its 303(d) list of impaired waters every two years and submits the list to the Environmental Protection Agency for approval.

In addition to providing water resource managers and the public with information regarding the health of New Jersey's waters, the report identifies management strategies for improving overall water quality. The report is available, electronically, from the NJDEP Water Monitoring and Standards (WM&S) web page at: [www.state.nj.us/dep/wms/bwqsa/generalinfo.html](http://www.state.nj.us/dep/wms/bwqsa/generalinfo.html). For additional information, contact Leslie McGeorge or Debra Hammond, NJDEP/WM&S, at (609) 292-1623.

*Alena Baldwin-Brown is Executive Assistant for Water Monitoring and Standards, NJDEP.*



**Share your thoughts and expertise on water issues in New Jersey!**

**Join the discussion at New Jersey Water Blog. <http://njwrri.blogspot.com>**

## Can Science and Policy Align to Address Southern New Jersey's Growing Water Demands?

Joseph J. Hochreiter, CGWP

Southern New Jersey has the good fortune to be situated atop the New Jersey Coastal Plain Aquifer system, one of the more prolific in the country. This series of inter-bedded sandy aquifers (see illustration) holds in storage many trillions of gallons of water, upon which the entire developmental history of the region has depended. The prolific nature of these aquifers led many to develop, price, and consume water as if it had an unlimited capacity for replenishment. It does not.

Saltwater intrusion threatens to contaminate parts of freshwater aquifers. Over pumping aquifers can lead to the 'mining' of water from long-term storage, resulting in potentially deleterious consequences. Over pumping has recently been implicated in the depletion of freshwater wetlands and impacts to sensitive ecological species. Our vibrant South Jersey economies depend on a reliable supply of good-quality, affordable water to support the development of commerce and communities. Within the past 10-20 years, the demand for increasing supplies of water has periodically collided with the need to preserve and protect the environment producing that very water.

NJDEP's Division of Water Supply, working with the U.S. Geological Survey (USGS), the Pinelands Commission, and others, has the responsibility for developing regulations that balance the demand for, and protection of, water. The process currently in place to regulate the allocation of water among water companies, farmers, and the communities they serve is far too complex for description here. While current management at NJDEP seems to better understand how to address the demand-protection balance than prior administrations, considerable work remains to establish a rational and predictable process for allocating water in Southern New Jersey.

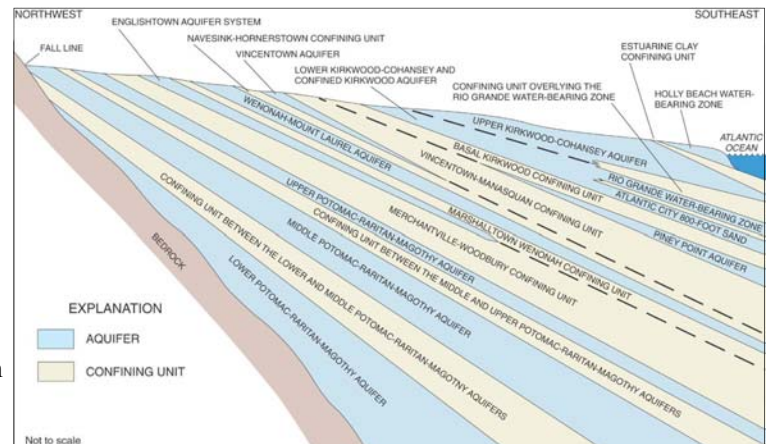
In my consulting work for the Builders League of South Jersey, I'm monitoring the progress of the following key studies that, depending on how well they are done, could help establish the scientific foundation for optimizing regional water supply policies:

- the long-anticipated (and 5-years late) New Jersey Water Supply Master Plan (due in 2007);
- the Pinelands Commission's Kirkwood-Cohansey Study (due in 2009); and
- the USGS's ongoing effort to develop three-dimensional groundwater/surface water flow models for major watersheds in Southern New Jersey.

While good policy is always rooted in good science, science alone cannot ensure that sound water management policies are developed. We've attempted to identify the essential elements of a comprehensive water supply management plan. While this is a work in progress, we suggest that NJDEP consider the following:

1. Water Conservation – Define and institute simple, reasonable, mandatory water conservation measures (e.g. odd/even watering, incentives for equipment upgrades, and public awareness training)
2. Water Reuse – This involves the recovery of treated wastewater for irrigation (lawns, golf courses) and aquifer recharge (both infiltration and injection). Other related issues:
  - a. At the regional level - how can we redistribute treated wastewater discharging from large treatment plants?
  - b. At the local level - how can we encourage builders to invest in the infrastructure needed to capture, treat, and reinject treated wastewater at the subdivision level?
3. Regional Analysis of Sustainable Yield – The aforementioned USGS groundwater/surface water flow models should be used as a comprehensive management tool. Such a tool could guide in the placement of new supply wells and optimize pumping schemes during periods of drought and surplus to protect the aquifer and streamflow.
4. Alternative Water Sources –
  - a. As the costs decrease for operating desalination plants, there are parts of South Jersey where desalination would make sense. Desalination doesn't necessarily mean putting a pipe in the ocean and making fresh water. For our region, it means being able to pump saline groundwater (far less salty than the ocean) and treat it for potable use.
  - b. Southeastern New Jersey has only one sizable water supply reservoir. Does it make economic sense to construct additional reservoirs to capture precipitation during times of surplus?
  - c. Water system interconnects allow for the movement of water from one region to another during times of need. These pipes need to be installed across the region to mitigate hard hit areas during drought.
5. Regionalization of Water Rates – Institute uniform regional water rates that are reasonable, yet reflect the true value of the resource, and consider creating a regional infrastructure trust fund to develop supply interconnects and reuse infrastructure.

Addressing the above recommendations is technically quite doable, and would serve to resolve issues related to water supply in an environmentally responsible way. Politically, however, some of these recommendations will require a degree of sophistication and cooperation across constituencies that has yet to be seen.



Cross-sectional diagram of the New Jersey Coastal Plain Aquifer System.  
Courtesy of Anthony Navoy, U.S. Geological Survey, 2007.

## *National Academy of Sciences Reports on Water Reuse*

- Issues in Potable Reuse: The Viability of Augmenting Drinking Water with Reclaimed Water. National Research Council. 1998
- Use of Reclaimed Water and Sludge in Food Crop Production. National Research Council. 1996.
- Ground Water Recharge Using Waters of Impaired Quality. National Research Council. 1994.

These reports can be obtained from the National Academies Press: [www.nap.edu](http://www.nap.edu)

## *Conference Calls*

### **Meadowlands Symposium II**

May 15-17, 2007 in Lyndhurst, New Jersey

For more information, visit [http://meri.njmeadowlands.gov/conf\\_2007.html](http://meri.njmeadowlands.gov/conf_2007.html)

### **2007 AWRA Summer Specialty Conference—Emerging Contaminants of Concern in the Environment: Issues, Investigations & Solutions**

June 25-27, 2007 in Vail, Colorado

For more information, visit [www.awra.org/meetings/Vail2007/index.html](http://www.awra.org/meetings/Vail2007/index.html)

For upcoming conferences, events, and training sessions in New Jersey and beyond:

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## *New Jersey Flows*

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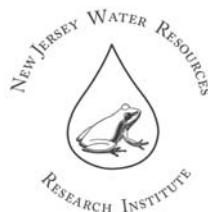
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