SIXTH REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY

Regarding the Progress of the:

DELAWARE WATER SUPPLY COORDINATING COUNCIL

March 26, 2004

REVISED: June 7, 2004

Prepared by the:

Delaware Department of Natural Resources and Environmental Control

Delaware Geological Survey

University of Delaware, College of Human Services, Education, and Public Policy
Institute for Public Administration - Water Resources Agency

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MEMORANDUM

TO: Governor Minner, Members of the Delaware General Assembly, and Members of the Delaware Water Supply Coordinating Council

FROM: Gerald J. Kauffman, State Water Coordinator
Kevin J. Vonck, Senior Research Assistant
University of Delaware, Institute for Public Administration - Water Resources Agency

DATE: June 7, 2004

SUBJECT: Revised Sixth Report

Enclosed is an amended version of the *Sixth Report to the Governor and General Assembly Regarding the Progress of the Delaware Water Supply Coordinating Council*, published March 26, 2004. The June 7, 2004 revisions include:

- A recalculation of wells and aquifer storage and recovery capacity for Artesian Water Company (noted on pages 5 and 7). The revised figures indicate that 800 million gallons (13 mgd) of additional water supply capacity are available since 1999 instead of 740 million gallons (12 mgd) as noted in the March 26, 2004 version of the Sixth Report.

- A status update on the construction of the Newark Reservoir (noted on page 7). Installation of the liner was initiated but not completed because of wet weather in 2003 and disagreements between the contractor and the engineer. Newark City Council voted to terminate the contract with the contractor in January 2004. The City plans to resume construction in summer 2004 and complete the project approximately six months from the start date.

This Report and previous Reports to the Governor and General Assembly are available online at:
www.wr.udel.edu

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

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March 10, 2004

The Honorable Ruth Ann Minner
Governor, State of Delaware
Legislative Hall
Dover, Delaware 19901

142nd General Assembly
Legislative Hall
Dover, Delaware 19901

Dear Governor Minner and Members of the 142nd General Assembly:

As chairman of the Water Supply Coordinating Council, it is my pleasure to forward to you our sixth progress report.

As you are aware the term of the Water Supply Coordinating Council expired at the end of last year. It was re-established (under H.B 203 H.A. 2) with an expanded membership and state-wide scope. This is the Council's last report as issued by the original members.

Our intention, however, is to continue reporting on the progress of critical supply enhancements underway in New Castle County. We continue to make progress to provide sufficient water supply in that region to meet projected demand during drought for the year 2020 and beyond. There has been one notable setback in an otherwise extremely rapid development mode. Due first to the excessively wet weather last year, and then later due to some contractual disputes, the completion of the City's reservoir has been delayed one year. The City was forced to terminate its primary contractor on the reservoir project and is now seeking a replacement. Plans now call for the completion of Delaware's first new public supply reservoir since 1931 to arrive by the end of 2004. This still remains a remarkable construction feat.

Speaking of Newark, the new iron removal plant for the City's southern wells was dedicated in November, 2003 and has been in successful operation since. This checks off another project as complete, bringing us closer to the one billion gallons of new water to be added to the system since 2000. Artesian continues to expand its ground-water storage project, and United Water Delaware is on the verge of launching theirs. The City of Wilmington is prepared to conduct additional engineering work to further enhance the operations of Hoopes Reservoir.

On another high note, with the Public Service Commission in lead and with the assistance of my staff, an investigation has been completed on the performance of the two investor owned utilities in northern New castle County effected by the 2002 drought. For the benefit of those who were not aware, this study was ordered by the Governor under a special docket to determine what, if any, weaknesses existed in their water systems or in their system operations under extreme drought conditions. An expert, world-renowned consultant was retained for the study, and what was found, simply put, was that the two utilities performed exceedingly well. The overall conclusion was that as a whole the residents of New Castle County were at virtually no risk of a water supply disaster even though they endured the new drought of record. And this was even before all the new supply projects have been completed.

I believe that this is the highest compliment we could receive. I too compliment not only those water companies, but the municipal water suppliers, and every other dedicated and talented member of the Water Supply Coordinating Council.

Last, I am in the process of soliciting representatives from the new organizations added to the Council, and I have tentative plans for a meeting early this spring. I trust you find the information in this report helpful. Should you have questions, please do not hesitate to contact my office.

Sincerely

John A. Hughes
Secretary

SIXTH REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY
***Regarding the Progress of the*:**
DELAWARE WATER SUPPLY COORDINATING COUNCIL
March 26, 2004
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Introduction

The State Water Supply Coordinating Council (WSCC) continued to advance toward its goal of developing one billion gallons of additional water supply and storage in northern Delaware during 2003. As of December 2003, purveyors have developed 800 million gallons of the projected deficit of 1,020 million gallons for a 60-day drought period in 2020 (17 million gallons per day). When the 317 mg Newark Reservoir is built, total storage added since 1999 will be 1,117 mg. Because stream flows reached record low flows during the drought of 2002, the WSCC reevaluated supply and demand projections and concluded that 262 to 450 mg of additional storage would be needed by 2020 to meet peak demands during a drought of record should a minimum flow standard be placed on the Brandywine Creek in the future. Members of the WSCC then nominated projects that each would sponsor and have the potential for groundbreaking and/or completion on a fast track status.

Reduction of drought vulnerability in Delaware was also an important topic of discussion within the state executive and legislative branches during 2003. In April, Governor Minner released her water supply initiative, "2020 On Tap: Ensuring Delaware's Fresh Water Supply." The plan builds upon previous efforts to ensure that northern Delaware will be self-sufficient during drought by 2010. In July 2003, Governor Minner signed HB 118, the Water Supply Self-Sufficiency Act, which established measures for achieving this goal. In August 2003, Governor Minner signed HB 203, which reauthorized the WSCC through January 1, 2010, and expanded the membership of the WSCC to include statewide representation.

A review of the 2002 drought suggests that WSCC activities have reduced drought vulnerability within northern Delaware. Because the WSCC closely monitors both supply and demand on a daily basis, it was able to accurately assess conditions and suggest appropriate conservation policies to the Governor's Drought Advisory Committee (GDAC) during 2002. The following list compares Delaware with surrounding areas in terms of duration of Drought Emergency declarations:

- New Castle County, Delaware: 70 days (August 2, 2002 to October 11, 2002)
- Cecil County, Maryland: 321 days (April 5, 2002 to February 20, 2003)
- Chester County, Pennsylvania: 297 days (February 12, 2002 to December 6, 2002)
- Salem County, New Jersey: 310 days (March 4, 2002 to January 8, 2003)
- Delaware River Basin Commission: 342 days (December 18, 2001 to November 25, 2002)

This report reviews the role of the State Water Coordinator and Water Supply Coordinating Council, summarizes water conditions within the state during 2003, and provides updates on activities and projects of WSCC members. The Delaware Department of Natural Resources and Environmental Control (DNREC), the Delaware Geological Survey (DGS), and University of Delaware, Institute for Public Administration - Water Resources Agency (UDWRA) authored this report on behalf of the WSCC. This is the sixth report of a series; previous reports are available online at www.wr.udel.edu.

State Water Coordinator

In July 2000, Governor Carper signed HB 549, which appointed the UDWRA as the Delaware State Water Coordinator. The mission of the Water Coordinator is to work cooperatively with the water purveyors in northern Delaware to ensure that new water supplies were developed on schedule by the end of 2003. Along with the Water Coordinator, HB 549 appointed the DGS and the Delaware DNREC as a triad of water advisors

to the WSCC. Although the State Water Coordinator appointment expired December 31, 2003 (when the new water supply projects were scheduled for completion), it has continued into 2004 by resolution of the WSCC.

Water Supply Coordinating Council

HB 549 also appointed the WSCC for a tenure extending until December 31, 2003. The WSCC was directed to 1) implement new water supplies in northern New Castle County to meet peak demands based on the drought of record by December 31, 2003; and 2) work cooperatively in a public-private effort between government and water purveyors to manage water supplies more efficiently in Delaware. The following public and private entities were appointed to the WSCC:

- Office of the Governor
- Secretary of the Delaware Department of Natural Resources & Environmental Control (Chair)
- Secretary of the Department of Public Safety
- Secretary of the Delaware Department of Agriculture
- Executive Director of the Public Service Commission
- Director of the Delaware Emergency Management Agency
- Director of the Delaware Geological Survey
- Director of the Delaware Division of Public Health
- Public Advocate
- Executive Director of the Delaware River Basin Commission
- New Castle County Executive
- Artesian Water Company
- City of Newark
- City of Wilmington
- New Castle Municipal Services Commission
- Tidewater Utilities, Inc.
- United Water Delaware
- New Castle County Chamber of Commerce
- Delaware State Chamber of Commerce
- Delaware Nursery and Landscape Association
- Delaware Professional Grounds Management Society
- Delaware State Golf Association
- Delaware Nature Society
- Coalition for Natural Stream Valleys
- New Castle County Civic League

The WSCC met on the following dates:

2000	March 3*	Carvel State Office Building, Wilmington, Del.
	March 24*	Carvel State Office Building, Wilmington, Del.
	May 22*	Delaware Geological Survey, Newark, Del.
	July 31	New Castle County Chamber of Commerce, Churchman's Crossing, Del.
	October 4	Artesian Water Company, Churchman's Crossing, Del.
2001	January 10	United Water Delaware, Stanton, Del.
	March 14	Artesian Water Company, Churchman's Crossing, Del.
	June 14	United Water Delaware, Stanton, Del.
	October 4	Artesian Water Company, Churchman's Crossing, Del.

2002	February 5	United Water Delaware, Stanton, Del.
	April 17	Artesian Water Company, Churchman's Crossing, Del.
	July 10	Artesian Water Company, Churchman's Crossing, Del.
	September 11	Artesian Water Company, Churchman's Crossing, Del.
	October 17	Delaware DNREC, New Castle, Del.
	November 21	Artesian Water Company, Churchman's Crossing, Del.
	December 12	Artesian Water Company, Churchman's Crossing, Del.
2003	May 22	Artesian Water Company, Churchman's Crossing, Del.
	July 16	Artesian Water Company, Churchman's Crossing, Del.
	October 9	Artesian Water Company, Churchman's Crossing, Del.
	December 11	Artesian Water Company, Churchman's Crossing, Del.

* The WSCC met under Executive Order 74 (December 30, 1999) before HB 549 was signed in July 2000.

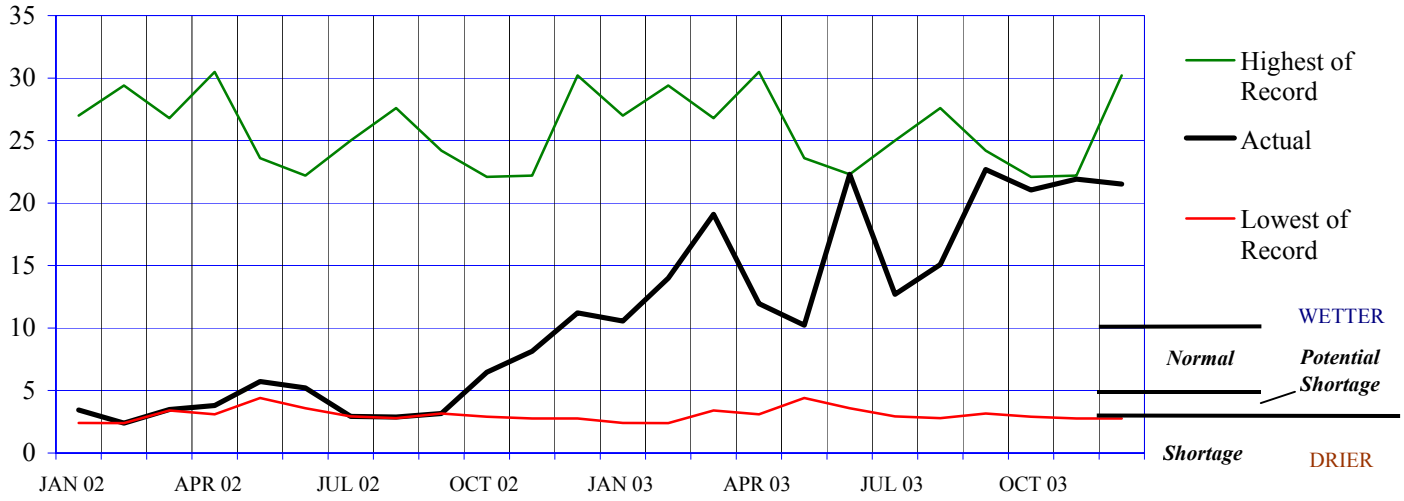
In August 2003, Governor Minner signed HB 203, which reauthorized the WSCC through January 1, 2010, expanded the membership of the WSCC to include statewide representation, and appointed the DGS and UDWRA as voting members. The new mandate of the WSCC is to work cooperatively to achieve water supply self sufficiency in northern New Castle County (eliminate dependence on out of state supplies) by 2010 and to develop and publish water supply plans for southern New Castle County, Kent County, and Sussex County. The following entities (or their designees) were added as voting members of the expanded WSCC:

- University of Delaware, Institute for Public Administration - Water Resources Agency
- Kent County
- Sussex County
- Public Water Supply Utility in Sussex County Association of Towns (SCAT)
- Public Water Supply Utility in League of Local Governments, Kent County
- Delaware Rural Water Association
- National Association of Water Companies, Delaware Chapter (not already represented in NCC)
- Local Chamber of Commerce in New Castle County
- Local Chamber of Commerce in Kent County
- Local Chamber of Commerce in Sussex County
- Delaware Farm Bureau
- Center for Inland Bays
- State Fire Marshall

The Secretary of DNREC (or his/her designee) serves as Chair of the WSCC. The Council, by majority vote, may designate additional members. The Council, by majority vote, may also establish subcommittees to deal with specific water supply issues and plans.

Delaware Water Conditions Update

DGS Water Conditions Index (WCI): The WCI for New Castle County exhibited a significant rise during 2003, following twelve months (Oct. 2001 – Sept. 2002) of being in the "Potential Shortage" and "Shortage" ranges. The WCI increased from 3.7 in October 2001 to 21.5 by December 2003.



Precipitation: Precipitation for the 2003 calendar year was significantly above normal throughout Delaware.

Location	*Total Precip.*	*Normal Precip.*	*Difference*	*% of Normal*
Dover	62.97"	46.28"	+ 16.69"	136%
Greenwood	57.43"	45.99"	+ 11.44"	125%
Georgetown	58.48"	45.34"	+ 13.14"	129%
Lewes	59.93"	46.00"	+ 13.93"	130%
New Castle (NWS)	54.87"	42.81"	+ 12.06"	128%
Wilmington (Porter Res.)	64.88"	45.48"	+ 19.40"	143%

Precipitation recorded at New Castle and Dover were the highest, Wilmington was the second highest, Lewes was third highest, and Georgetown was the fourth highest, respectively, on record since 1949.

Stream Flows: Monthly mean stream flows were generally above normal from June through December in northern Delaware. The Brandywine Creek experienced the third highest annual mean stream flow on record in 2003. Record high monthly mean flows were recorded for the Brandywine in June and November, the second highest in September, and the third highest in October and December.

Monthly mean stream flows were above normal in central Delaware from February though December. The St. Jones River experienced the highest annual mean stream flow on record in 2003. The second highest flows of record were recorded on the St. Jones in June and July, and the third highest in December.

Monthly mean stream flows were above normal in southern Delaware from February though December. The Nanticoke River experienced the highest mean annual stream flow on record in 2003. The second highest flows of record were recorded on the Nanticoke in June and November, and the third highest in July, September, and December.

Chlorides: During a period of snowmelt the first week of February 2004, United Water Delaware recorded elevated chlorides (126 mg/l) in the White Clay Creek at their Stanton Intake. The elevated readings were due to road salt.

Ground-water Levels: Ground-water levels are above normal. Following months of record low water levels during much of 2002, levels in shallow water-table wells (unconfined aquifer) began a dramatic rise in September and October of 2002 due to above normal precipitation. Contrary to historical trends, water levels

continued to rise through the early summer of 2003 (July) in northern Delaware. Water levels continued to rise seasonally through February 2003 in southern Delaware and remained above normal during the rest of the year.

Northern Delaware Public Water Demand

Water Purveyor	*Peak Daily Demand (mgd)*	*Date (2003)*
City of Wilmington	26.9	June 26
Artesian Water Company	24.9	June 29
United Water Delaware	26.2	June 26
City of Newark	5.5	August 11
New Castle MSC	1.0	July 3

The peak daily demand for northern Delaware (combined purveyors) was 74.9 million gallons per day (mgd) on June 26, 2003. The peak water transfer through interconnections was 3.5 mgd on both September 2 and 3, 2003. In comparison, the peak daily demand during 2002 was 82.7 mgd, recorded on July 10, 2002. The historic peak daily demand of 93.1 mgd was recorded on July 18, 1997.

Supply and Demand Projections through 2020

The December 2, 1999 Water Supply Task Force (WSTF) Report contained compiled estimates of public water supply and demand in northern New Castle County for drought conditions in the years 2000, 2010, and 2020. The estimates assume a worst-case historic drought with environmental standards for minimum stream flows (7Q10) in effect along the Brandywine Creek and White Clay Creek. There are currently no minimum stream flow requirements applicable to the Brandywine Creek at Wilmington. The supply and demand curves forecast a deficit of 17 mgd or 1.020 billion gallon deficit for a 60-day drought period in the year 2020:

Scenario/Year	*Supply (mgd)*	*Demand (mgd)*	*+/- (mgd)*	*Volume (mgd)*
2000	73.0	86.0	-13.0	-780
2010	73.0	88.0	-15.0	-900
2020	73.0	90.0	-17.0	-1,020

The WSCC has been working to develop a series of water supply projects to close the 17.0 mgd gap in northern Delaware (north of the C&D Canal). At that time, the water purveyors committed to an "A List" of options that have few environmental constraints, enjoy community support, and could be implemented by the close of 2003. The following table provides the status of these projects:

Sponsor	Project	Targeted capacity Dec. 1999 (mg) / (mgd)	Capacity in service Dec 2003 (mg) / (mgd)	Status of completion
City of Newark	Newark Reservoir	200 / 3	0	70% complete, 317 mg reservoir operational late 2004/early 2005
City of Wilmington	Hoopes Reservoir Deep Storage Plan	500 / 8	500 / 8	Complete
Artesian Water Company	New Wells North of C&D Canal	120 / 2	120 / 2	Complete, Chesapeake City Road well online
City of Newark	South Wellfield Iron Treatment Plant	60 / 1	60 / 1	Complete and online, November 2003
Artesian Water Company	Aquifer Storage and Recovery	300 / 5	120 / 2	AWC pumped 120 mg from ASR during 2002 drought
	Projected 2020 Deficit: 1,020 / 17	**1,180 / 19**	**800 / 12**	

Updated Supply and Demand Projections through 2020

The drought of 2002 replaced the drought of 1965-66 as the drought of record in northern Delaware. Because streamflows on the Brandywine Creek reached record low flows (thereby reducing safe yields), the WSCC reevaluated supply and demand projections for northern Delaware. This assumes all of the projects on the 1999 WSCC "A List" (about 1 bg) are implemented by the end of 2004. The WSCC adopted these updated supply and demand projections for northern Delaware on October 17, 2002. The WSCC concluded that 262 to 450 mg of additional storage would be needed by 2020 to meet peak demands during a drought of record. The WSCC adopted these projections as the minimum water supply necessary to accommodate the peak water demand of the projected population in 2020 without water restrictions, even with a recurrence of conditions similar to the drought of 2002. These projections are based on a set of conservative assumptions of a future environmental standard (7Q50 or 7Q10) along the Brandywine Creek by 2020 and peak monthly water demands occurring during a drought lasting 75 days. The following table summarizes the updated supply/demand projections:

Scenario/Year	*Supply (mgd)*	*Demand (mgd)*	*+/- (mgd)*	*Volume (mgd)*
2003	82.0	83.3	-1.3	-97
2010	82.0	86.3	-4.3	-322
2020	82.0	88.0	-6.0	-450

At the November 21 and December 12, 2002 meetings, the WSCC identified a series of additional water supply projects that could be constructed to meet a projected 2020 deficit of 262 to 450 mg, depending on the assumption of minimum stream flow standards (7Q50 or 7Q10) that could be imposed along the Brandywine Creek by 2020. Members of the WSCC then nominated projects that each would sponsor and have the potential for groundbreaking on a fast track status. Each of the sponsors provided a report summarizing the status of their project with a conceptual evaluation of project feasibility and volume (mg/mgd) based on the following criteria:

Engineering: Estimate feasibility from a technical, hydraulic, and/or geologic perspective(s).
Environmental: List the environmental/ecological benefits and constraints.
Regulatory: List federal, state, and local permitting requirements.
Economic: Estimate the capital plus annual operating and maintenance costs.
Community: Determine if the project will have community support.
Timing: Forecast chances for project groundbreaking and/or completion by end of 2003.

The WSCC decided that the following options are most practical for a new "A List" to close the 262 to 450 mg gap between water supply and demand in northern Delaware projected for 2020:

Sponsor	Project	Volume (mg)	Capital Cost (Cost/mg)	Status
City of Wilmington, United Water Delaware	Raise Water Level in Hoopes Reservoir by 1 foot to 5 feet	60-375	$4.0-$5.0 M ($13,333-$66,667)	Retained consultants for topographic, forestry, structural, and hydraulic analysis.
City of Wilmington	Increase Hoopes Pump Station Capacity	36-510	$0.4-$9.2 M ($3,704-$18,039)	City retaining consultant to conduct $50,000 study with State DNREC funding.
Artesian Water Company	Aquifer Storage and Recovery	150	$1.2 M ($8,000)	Retained consultant to conduct testing at Wilmington Manor Gardens and Artisans Village sites
United Water Delaware	Aquifer Storage and Recovery	225	$4.0 M ($17,777)	Retained consultant to conduct testing near Del. City and Smalleys Pond. Smalleys Pond site study completed: not feasible.
United Water Delaware	Modification of Tidal Capture Structure Operating Plan	75 to 500	None Identified	Retained ecological consultant, waiting to conduct low flow testing during Summer 2004.

Progress and Activities

Artesian Water Company

- *New Wells*: In December 1999, AWC was granted an increased seasonal allocation of 0.7 mgd for its Old County Road wellfield. In late 2001, AWC placed in service a new 0.2 mgd well at Artisans Village to re-distribute pumpage in order to fully utilize its wellfield allocation. AWC has added two new wells at Middle Run Crossing with an allocation of 1.0 mgd and has placed wells in service at Chesapeake City Road providing 0.4 mgd. The total additional capacity provided by these wells is 2.3 mgd.
- *Aquifer Storage and Recovery*: AWC completed eleven cycles of its Aquifer Storage and Recovery (ASR) testing program at a maximum rate of 2.0 mgd (120 mg over 60 days), and AWC pumped 120 mg of water from the Llangollen (just south of New Castle) ASR wells to meet peak demands during the summer of 2002. AWC retained consultants to conduct test drilling for ASR at Wilmington Manor and Artisans Village, both in the Coastal Plain, estimating a potential yield of 37.5 mg over 75 days for each.
- *Chesapeake and Delaware Canal Pipeline*: In December 2003, AWC received permits from the US Army Corps of Engineers to install a double pipeline under the C&D Canal near the Summit Bridge to interconnect water systems on both sides of the canal for assurance of system reliability.

City of Newark

- *Newark Reservoir*: Completion of a 317-mg reservoir will make the City nearly self-sufficient. The project is 70% complete with the raceway renovated, intake pipeline in place, and almost one million cubic yards of soil excavated. Installation of the liner was initiated but not completed because of wet weather in 2003 and disagreements between the contractor and the engineer. Newark City Council voted to terminate the contract with the contractor in January 2004. The City plans to resume construction in summer 2004 and complete the project approximately six months from the start date.
- *Newark South Wellfield Iron Treatment Plant*: The City completed construction on the iron, manganese, and organics removal plant at the South Wellfield, putting it into service on November 21, 2003. This project increased water supply from the plant by 1.0 mgd.

City of Wilmington

- *Hoopes Reservoir*: The City's contractor conducted a dam safety inspection which concluded the dam is structurally sound, but in need of concrete surface spalling repairs. The City retained consultants for topographic, forestry, structural, and hydraulic analyses to evaluate the feasibility of raising the water level five feet to provide an additional 375 mg. At the October 9, 2003 meeting, the State Water Coordinator recommended that the WSCC consider a financing plan that would prorate the cost of raising the reservoir level based on the water purveyor's needs (2020 deficit) and State's stake in modifying the three roads near the reservoir. This recommendation will be the subject of discussion at the next WSCC meeting. Such a financing plan would be based on the following hypothetical formula:

Entity	2020 Deficit	% of Deficit	% Contribution	Funding
Purveyor X	-1.0 mgd	16.7 %	15 %	$ 750,000
Purveyor Y	- 2.0 mgd	33.3 %	30 %	$ 1,500,000
Purveyor Z	- 3.0 mgd	50.0 %	45 %	$2,250,000
State	----	----	10 %	$ 500,000
Subtotal	- 6.0 mgd	100 %	100 %	$ 5,000,000

- *Brandywine Creek to Hoopes Reservoir Pump Station:* The City is retaining a consultant to conduct a $ 50,000 study to evaluate the feasibility of increasing the capacity of the pump stations that supply water to Hoopes Reservoir. This alternative has the potential to add 36 mg to 510 mg of additional volume that could be drawn from the reservoir during drought. The State is a source of funding for this consulting work. The February 2004 Parsons report recommended this as a priority alternative.
- *Hoopes Reservoir Operating Plan*: The City completed an operating plan for Hoopes Reservoir which was approved by the DNREC Secretary in 2001 which indicates that the City would release from 3 to 5 mgd (500 mg total) of raw water as requested by other utilities provided the reservoir level was between elevation 220 feet (full) and 210 feet (-10 feet). Below an elevation of 210 feet, the City reserves the right to retain the remaining contents of the reservoir for its internal use. The City also recommended reservoir level indicators for the WSCC to use in the Drought Advisory Guidelines.
- *United Water Delaware Contract*: On August 28, 2002, Wilmington City Council authorized a contract for the sale of water from Hoopes Reservoir to United Water Delaware (UWD) that authorizes UWD to purchase up to 200 mg of raw water annually from the reservoir. The contract provides water from the top wedge of Hoopes for release to the Red Clay Creek to supplement water at the UWD Stanton intake during low stream flow and/or during times when elevated chloride levels are present at the intake. The contract allows UWD to pay an annual "reservation charge" for a volume of water ranging from 50 mg to 200 mg. There is an additional "usage charge" for the actual volume of water released from Hoopes for UWD. In the event UWD requests the City to release more than 200 mg, and the City agrees, UWD shall pay the City an "excess release charge."

New Castle Municipal Services Commission

- *Wells*: With a supply of 1.7 mgd and a peak demand of 0.5 mgd, the New Castle MSC has excess capacity from its wells and can presently sell water to AWC through interconnections when requested.
- *Interconnection*: New Castle MSC completed construction of a new 1.0 mgd interconnection with AWC at the Riveredge Industrial Park in the summer of 2002.

United Water Delaware

- *Chloride Monitoring*: UWD implemented a Chloride Monitoring Plan that includes three stations along the tidal Christina River and White Clay Creek to provide early warning of elevated chloride levels at its Stanton intake. This plan is designed to optimize blending of Hoopes releases with water withdrawals from the creek to minimize chloride levels in drinking water supplies during low flows. The plan was implemented during the drought of 2002 and was successful in reducing chloride levels in treated drinking water leaving the Stanton plant and ensured compliance with the U.S. EPA chloride standard (250 ppm).

- *Aquifer Storage and Recovery*: UWD is evaluating future use of Aquifer Storage and Recovery (ASR) technology (225 mg target based on preliminary estimates) in its River Road service area just north of the C&D Canal. Testing conducted in 2002 deemed the ASR site for its southern service area (south of Smalley's Pond) unfeasible.
- *Christiana Water Treatment Plant*: UWD sought and recently received an operating permit from DNREC for an existing well (0.3 mgd) at the Christiana Treatment Plant to be used for dilution during high chloride events.
- *Interconnections*: UWD signed an agreement with the City of Wilmington in October 2000 for the purchase of 3 mgd of finished water through existing interconnections. The Chatham interconnection was upgraded in 2001 and the Atlas interconnection upgrades were completed in 2002. UWD continues to evaluate the feasibility of additional interconnections with the City of Wilmington.
- *Tidal Capture Structure (TCS) Operating Plan*: UWD is working with DNREC to develop a new operating plan for the TCS that increases water available to UWD while protecting the ecology and fishery in the tidal White Clay Creek. Preliminary estimates indicate that the modified TCS operating plan could provide between 75 mg and 500 mg of additional water supply. UWD forwarded the draft plan to the Delaware River Basin Commission in 2002 and was scheduled to conduct low flow testing during the summer of 2003 to verify depth of flow assumptions. High stream flows throughout 2003 delayed this testing to 2004.

Interconnected System

The water purveyors conducted hydraulic testing and modeling to increase the northern Delaware interconnected system capacity to move water during drought or other emergencies. As of December 2003, there were 25 interconnections in place, compared to 23 interconnections in place in 1999. The peak water transfer through interconnections in 2003 was 3.5 million gallons per day (mgd) on both September 2 and 3, 2003.

Conservation Water Rates

- *HB 118*: Governor Minner signed HB 118, the Water Supply Self-Sufficiency Act, in July of 2003. The law states that each water utility shall implement a water conservation rate structure for services provided to its residential customers in drought sensitive areas. It shall reflect either an inclining block rate structure or a seasonal rate structure.
- AWC continues its conservation water rate structure that has been in place since 1992.
- Newark increased its water rates (effective July 2001) to fund its proposed reservoir and water treatment plant improvements. The City temporarily discontinued its seasonal conservation water rate structure (in place since 1999) when citizens approved an increase in water rates to fund a new reservoir.
- New Castle Municipal Services Commission instituted a conservation water rate structure in 2001.
- The Delaware River Basin Commission required United Water Delaware to conduct a study evaluating the feasibility of adopting conservation water rates. UWD expects to file for water conservation oriented rates.
- Wilmington has gathered data from the UD Water Resources Agency and other to determine the feasibility of adopting conservation water rates in the City.

Northern New Castle County Ground-water Modeling Study

The DNREC Division of Water Resources signed a contract on May 23, 2000 with the US Army Corps of Engineers to estimate the long-term safe yield of ground-water for supply in northern New Castle County. The Corps will update earlier studies by the USGS and DGS that indicated ground-water availability from northern New Castle County in the coastal plain to be about 32 mgd. The capacity of wells allocated by

DNREC in this area is 31 mgd. The ground-water modeling area is in that portion of the Coastal Plain that extends north-south from Wilmington to Middletown, Delaware and east-west from New Jersey across New Castle County into Maryland. The Corps expects to complete the project in November 2004.

Green Industry Guidelines

The DNREC Division of Water Resources, UDWRA, and DGS worked with members of the "Green Industry" in the state to revise rules for water use during drought as they pertain to the nurseries, golf courses, and landscaping firms. These rules were approved by the Office of the Governor and were useful in moderating economic impacts during the declaration of drought emergency (with mandatory restrictions) in 2002. Evolution of these rules will continue during development of the three-phase drought operating plan.

Governance

- *HB 118*: Governor Minner signed HB 118, the Water Supply Self-Sufficiency Act, in July of 2003. The law established a goal of water supply self-sufficiency in northern Delaware (eliminate dependence on out of state sources) by 2010.
- *SB 370*: In July 2000, Governor Carper signed SB 370, which transferred the jurisdiction for issuing water supply franchise areas, called Certificates of Public Convenience and Necessity (CPCNs) from DNREC to the PSC effective July 1, 2001. On June 5, 2001 the PSC adopted regulations governing the award of CPCNs to public and investor-owned water purveyors statewide.
- *PSC Order No. 6068*: On November 19, 2002, the PSC issued Commission Order No. 6068 which opened an investigation into the water supply available to Artesian Water Company and United Water Delaware: (a) during the drought between March 5 to October 11, 2002, and (b) over the next five years. Pursuant to the order, AWC and UWD were required to submit reports listing available supplies and estimating peak demand. The reports were filed in January of 2003. The order also directed the PSC staff to issue a report to the Commissioners at the conclusion of its investigation. Subsequently, the PSC contracted with a consulting firm, Parsons, to conduct the investigation. The Parsons report, dated February 2004, concluded that the utilities complied with their responsibilities during the drought of 2002 and have the ability to "provide efficient, sufficient, and adequate" supply for customers within northern New Castle County during future drought conditions.

Glenville Reservoir

The Glenville residential subdivision (in Stanton south of Delaware Route 4) sustained significant flood-related damage during several storms, most recently from the remnants of Tropical Storm Henri in mid-September of 2003. The reservoir proposal was suggested to address two significant problems: Glenville residents' desire that the government buy their properties to allow them to move out of the flood-prone area and the need to increase reserve water supplies in northern Delaware. The proposal was evaluated on multiple layers, including engineering, environmental, regulatory, economic, and timing factors, as well as community support. This project has been tabled indefinitely because of the excessive cost of construction relative to the yield.

Bread and Cheese Island Reservoir

DelDOT, DNREC, the U.S. Army Corps of Engineers, and New Castle Conservation District have taken the lead on this project and are currently discussing options for stormwater management and wetlands mitigation on privately owned land on Bread and Cheese Island near Churchmans Marsh. Further evaluation will determine whether this property is suitable for a reservoir.

Northern Delaware Drought Operating Guidelines

Prepared and Approved by: Subcommittee of the Delaware Water Supply Coordinating Council

The January 2003 Fifth Report to the Governor and General Assembly regarding the progress of the Water Supply Coordinating Council (WSCC) recommended amending the Delaware Drought Operating Plan. Presently, Delaware has a two-phase advisory system of (1) warning and (2) emergency. The WSCC recommended implementation of a three-phase drought advisory system that incorporates goals for water conservation, has the potential to provide earlier notice of drought actions to the public, and aligns Delaware with the drought advisory systems of adjacent states.

The purpose of these Drought Advisory Guidelines (DAG) are to provide technical guidance to the Governor's Drought Advisory Committee (GDAC) and the Delaware Water Supply Coordinating Council concerning declaration of drought advisories and water use restrictions in northern Delaware (the area of the state north of the Chesapeake and Delaware Canal). It should be noted that the indices within the DAG are guidelines, not triggers. Final declaration of drought advisories rests with the Governor based upon input from the GDAC. The Christina River Basin Drought Management Committee shall be made aware of any amendments to the DAG.

The DAG was prepared and approved by a subcommittee comprised of representatives from the following organizations: Artesian Water Company (AWC), City of Newark, City of Wilmington, Delaware Department of Natural Resources and Environmental Control (DNREC), Delaware Geological Survey (DGS), Delaware Nature Society (DNS), Delaware Grounds Management Association (DGMA), United Water Delaware (UWD), and the University of Delaware Water Resources Agency (UDWRA). This document contains two sections: 1) a set of recommended actions that incorporates goals for water conservation in Northern Delaware and 2) a set of indicators from which the WSCC and GDAC may assess "on the ground" conditions. This is a living document subject to revision in response to future changes in supply and demand projections or other factors that impact the effectiveness of the guidelines.

In spring of 2004, the subcommittee plans to develop a revised, more detailed DOP for northern Delaware which ties together: (a) existing plans for chloride monitoring, Tidal Capture Structure, Hoopes Reservoir and Newark Reservoir operations, and Aquifer Storage and Recovery; (b) existing master plans developed by the water utilities; and (c) the operating plans mandated by DNREC and DRBC allocation permits and dockets. The DOP will include recommendations and protocols for the regional coordination of water withdrawals, interconnections, and use of water storage during a drought. The goal of the revised DOP is to ensure that northern Delaware can endure a drought of the magnitude of 2002 without mandatory water use restrictions.

Drought Advisory Levels

The WSCC recommends three stages of drought advisory in Delaware:

1) ***Watch***: The potential for drought suggests that voluntary water demand reductions be requested
2) ***Warning***: An imminent (but not certain) drought recommends increased water demand reductions, though still on a voluntary basis
3) ***Emergency***: With declining water conditions, there is no alternative but to declare a state of emergency with mandatory water use restrictions

Each stage in the drought advisory correlates to a goal of conserving public and private water supplies in northern Delaware.

1) ***Watch***: Decrease public water supply use from domestic, commercial, and industrial sectors below 80 million gallons per day (mgd) through voluntary water conservation
2) ***Warning***: Decrease public water use below 73 mgd through voluntary water conservation

3) ***Emergency***: Decrease public water use below 68 mgd through mandatory water restrictions (*water use declined below 65 mgd in August 2002 after declaration of drought emergency with mandatory water restrictions*)

These goals will be reviewed periodically based upon changes in supply availabilities and demand estimates.

Drought Indicators

This section discusses the technical basis for the drought indicators. These indicators include the DGS Water Conditions Index, Precipitation, Stream Flow, Chlorides, Ground-water Levels, and Reservoir Levels. The WSCC reviewed water conditions during the droughts of the 1960s, 1988, 1995, 1999, and 2002 while constructing the framework.

DGS Water Conditions Index (WCI): The DGS WCI for northern Delaware is based on a formula that includes 6-month antecedent precipitation at the New Castle County (Wilmington) Airport and Wilmington Porter Reservoir, ground-water levels in DGS well Db 24-10, streamflows in Brandywine Creek, and population of northern New Castle County. The WSCC recommends that these indicators correspond with the following advisory levels:

1) ***Watch***: WCI = 4.0-5.0 (*the WCI dipped below 5.0 (the boundary between normal water conditions and potential shortage) in March 2002*)
2) ***Warning***: WCI = 3.0-3.99 or less (*the WCI dipped below 4.0 in July 2002*)
3) ***Emergency***: WCI less than 3.00 (*the WCI dipped below 3.0 (the boundary between potential shortage and shortage*) *in August 2002*)

Precipitation: The values were developed by the DGS using previous drought conditions. The WSCC recommends that these indicators correspond with the following advisory levels:

New Castle County (Wilmington) Airport:

1) ***Watch***: 6" to 8.99" running 12-month deficit
2) ***Warning***: 9" to 11.99" running 12-month deficit
3) ***Emergency***: greater than 12.00" running 12-month deficit

Wilmington Porter Reservoir:

1) ***Watch***: 6" to 8.99" running 12-month deficit
2) ***Warning***: 9" to 11.99" running 12-month deficit
3) ***Emergency***: greater than 12.00" running 12-month deficit

Stream Flows: This indicator is based on a 30-day moving average of stream flows as determined by the DGS at the following locations. "Exceedance" denotes the percent of time in any given year that the stream flow may exceed that value. The WSCC recommends that these indicators correspond with the following advisory levels:

Brandywine Creek at Wilmington (USGS/DGS Gage 01481500)

1) ***Watch***: 30-day moving average of 85 mgd (90% exceedance)
2) ***Warning***: 30-day moving average of 70 mgd (95% exceedance)
3) ***Emergency***: 30-day moving average of 48 mgd (98% to 99% exceedance)

White Clay Creek at Stanton (RCC+WCC) (USGS/DGS Gage 01480015)

1) ***Watch***: 30-day moving average of 42 mgd (85% exceedance)
2) ***Warning***: 30-day moving average of 37 mgd (90% exceedance)
3) ***Emergency***: 30-day moving average of 31 mgd (95% exceedance)

White Clay Creek at Newark (USGS/DGS Gage 01478650)

1) ***Watch***: 30-day moving average of 19 mgd (85% exceedance)
2) ***Warning***: 30-day moving average of 16 mgd (90% exceedance)
3) ***Emergency***: 30-day moving average of 13 mgd (95% exceedance)

Chlorides: Raw water from the White Clay Creek at the UWD intake is monitored for chlorides as part of a plan developed by UWD. Other chloride monitoring stations include downstream of the Tidal Capture Structure on White Clay Creek, the Christina River at Newport, and the Christina River at the Churchmans Boat Ramp. The WSCC recommends that these indicators correspond with the following advisory levels:

1) ***Watch***: Stream flows on the White Clay Creek at the UWD Stanton Intake are less than or equal to 37 mgd for five consecutive days; this initiates the UWD Chloride Monitoring Plan
2) ***Warning***: Chlorides exceed 250 parts per million (ppm) for 3 consecutive days at the Tidal Christina River at Newport (*indicator derived from the average of two high tide readings at this location*)
3) ***Emergency***: Chlorides exceed 250 parts per million (ppm) for 3 consecutive days at the UWD Stanton Intake (*indicator derived from the average of two high tide readings at this location*)

Ground-Water Levels: DGS Well Db 24-10 is a shallow ground-water table observation well in the coastal plain in Ogletown, Del. "Exceedance" denotes the percent of time in any given year that the water level may exceed that value. No indicator for deep wells in confined aquifers is currently recommended because of the inability to identify an indicator that would provide meaningful, repeatable information in a timely manner. Deep well pumping rates and draw-down levels will be reviewed and taken into consideration with the overall recommendations of the GDAC. In the event a valid indicator is identified, it will be added to this subsection. The WSCC recommends that these indicators correspond with the following advisory levels:

DGS Well Db 24-10 (feet below land surface)

1) ***Watch***: 14 to 14.99 feet (75% exceedance) (*The water level dropped below 14 feet in Oct. 2001*)
2) ***Warning***: 15 to 15.99 feet (90% exceedance) (*The water level dropped below 15 feet in Nov. 2001*)
3) ***Emergency***: greater than 16 feet (96% exceedance) (*The water level dropped below 16 feet in Mar. 2002*)

Aquifer Storage and Recovery

Starting with Drought Watch, and continuing through all drought advisory levels, purveyors (AWC, UWD) will report remaining water volume (in million gallons) to the GDAC.

Reservoir Levels: This indicator denotes reservoir water levels below maximum water elevation and percent capacity remaining. The levels were developed respectively by the City of Wilmington (Hoopes) and the City of Newark. The WSCC recommends that these indicators correspond with the following advisory levels:

Hoopes Reservoir (1,800 mg when full)

1) ***Watch***: minus 5 feet (elev. 215 feet) (85% capacity) (1,530 mg usable remaining)
2) ***Warning***: minus 7 feet (elev. 213 feet) (79% capacity) (1,422 mg usable remaining)
3) ***Emergency***: minus 9 feet (elev. 211 feet) (72% capacity) (1,296 mg usable remaining)

Newark Reservoir (317 mg when full)

1) ***Watch***: minus 10 feet (70% capacity) (221 mg usable remaining)
2) ***Warning***: minus 17 feet (52% capacity) (164 mg usable remaining)
3) ***Emergency***: minus 27 feet (28% capacity) (88 mg usable remaining)

Chester Water Authority Conditions

Starting with drought watch, and continuing through all drought advisory levels, UDWRA and/or DNREC will report remaining water levels in the Octoraro Reservoir to the Governor's Drought Advisory Committee.

DRBC Drought Advisory Levels

This indicator is used because the Governor of Delaware is a Commissioner on the DRBC. It is based on a storage-based rule curve for the New York City-Delaware River Basin reservoirs that controls the basin-wide drought operating status of the Delaware River Basin. The rule curve governs flow targets at Montague, N.J. and Trenton, N.J., as well as diversions to New York City and New Jersey. The purpose of the rule curve is to implement phased reductions in these flow targets and diversions in order to conserve storage. Section 2.5 of the DRBC Water Code contains detailed information regarding drought operations. Due to the relatively large storage capacity of the New York City reservoirs, dry soil conditions, reduced streamflows and lowered ground water levels often occur well before the DRBC's drought warning trigger is reached. These related drought conditions are addressed in drought management plans of the four basin states: New York, New Jersey, Pennsylvania, and Delaware.

1) ***Watch***: Entered when combined storage drops into the drought watch zone on the rule curve and remains there for five consecutive days.
2) ***Warning***: Entered on the day when combined storage drops into the drought warning zone.
3) ***Drought***: Entered when combined storage drops into the drought zone and remains there for five consecutive days.

Northern Delaware Drought Advisory Guidelines			
Advisories	**Drought Watch**	**Drought Warning**	**Drought Emergency**
Status	Potential	Imminent	Emergency
Demand Recommendations / Restrictions	Voluntary	Voluntary	Mandatory
Northern Del. Demand Conservation Goal	< 80 mgd	< 73 mgd	< 68 mgd
Indicators	**Drought Watch**	**Drought Warning**	**Drought Emergency**
DGS Water Conditions Index	4.0-5.0 (potential shortage)	3.0-3.99 (potential shortage)	<3.00 (shortage)
Precipitation: Running 12-month deficit			
New Castle County (Wilmington) Airport	6" to 8.99"	9" to 11.99"	>12.00"
Wilmington Porter Reservoir	6" to 8.99"	9" to 11.99"	>12.00"
Stream Flows: 30-day moving average			
Brandywine Creek at Wilmington	85 mgd (90% exceedance)	70 mgd (95 % exceedance)	48 mgd (98% to 99% exceedance)
White Clay Creek at Stanton (RCC+WCC)	42 mgd (85% exceedance)	37 mgd (90% exceedance)	31 mgd (95% exceedance)
White Clay Creek at Newark	19 mgd (85% exceedance)	16 mgd (90% exceedance)	13 mgd (95% exceedance)
Chlorides	Stream flows ≤ 37 mgd for 5 consecutive days on WCC at UWD Stanton Intake	Chlorides > 250 ppm for 3 consecutive days at the Christina River at Newport	Chlorides > 250 ppm for 3 consecutive days at the UWD Stanton Intake
Ground Water Levels			
Shallow DGS Well Db24-10	14 - 14.99 feet (75% exceedance)	15 - 15.99 feet (90% exceedance)	> 16 feet (96% exceedance)
Aquifer Storage and Recovery	Report remaining water volume (mg) to GDAC	Report remaining water volume (mg) to GDAC	Report remaining water volume (mg) to GDAC
Reservoir Levels			
Hoopes Reservoir (City of Wilmington)	- 5 feet (elev. 215 feet) (85% capacity)	- 7 feet (elev. 213 feet) (79% capacity)	- 9 feet (elev. 211 feet) (72% capacity)
Newark Reservoir	- 10 feet (70% capacity)	-17 feet (52% capacity)	- 27 feet (28% capacity)
CWA Conditions (Octoraro Reservoir)	Report water levels to GDAC	Report water levels to GDAC	Report water levels to GDAC
DRBC Conditions (NY City Reservoirs)	Drought Watch	Drought Warning	Drought

Draft:
March 4, 2004

* These drought operating guidelines are designed to provide guidance to the Governor's Drought Advisory Committee (GDAC) and the Delaware Water Supply Coordinating Council (WSCC). Final declaration of drought advisories rests with the Governor based upon input from the GDAC.

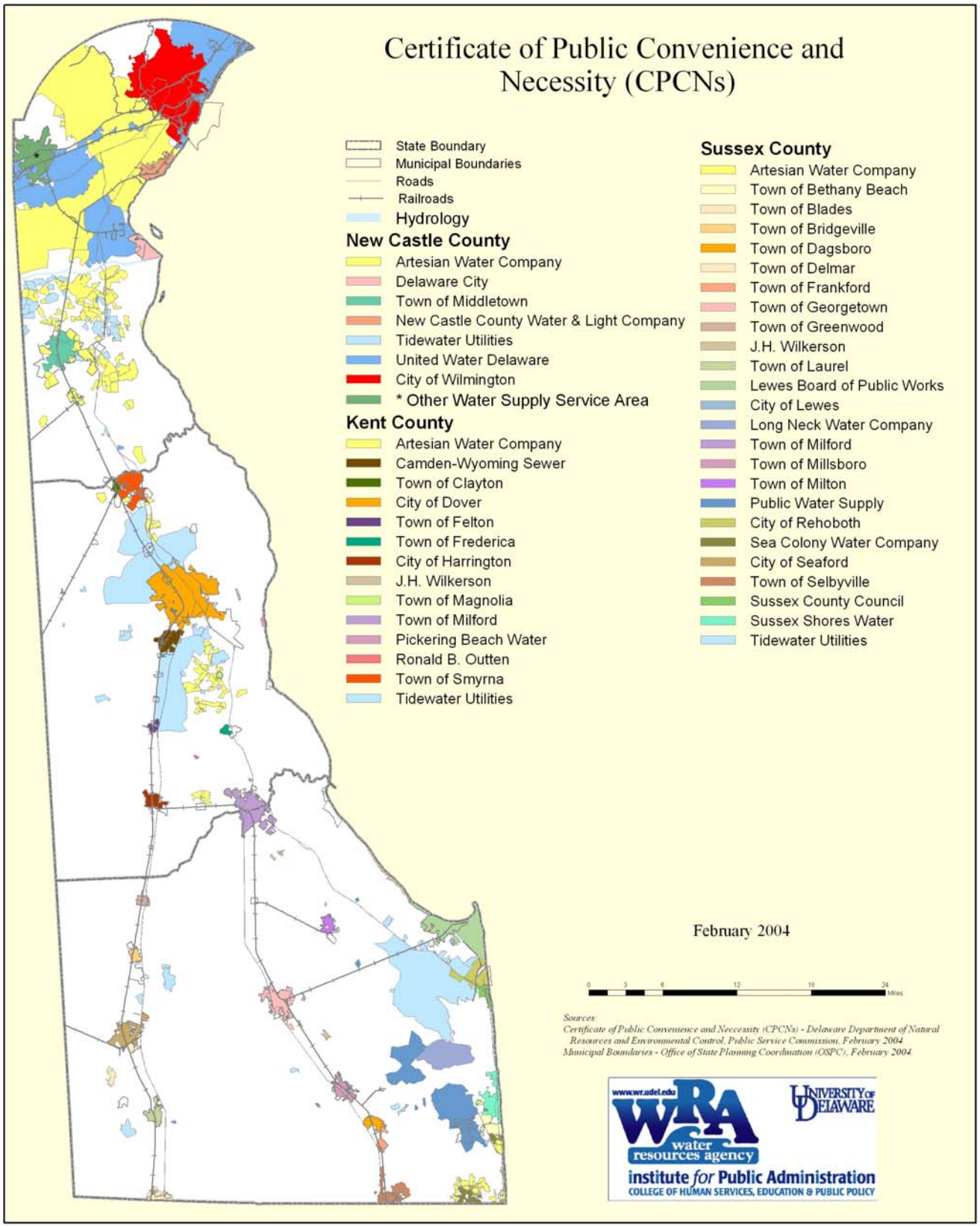


Figure 1. Delaware Water Supply Certificate of Public Convenience and Necessity Map.

Figure 2. Newark Reservoir, view looking north, Fall 2003.

Figure 3. Newark Reservoir, view looking south, Fall 2003.

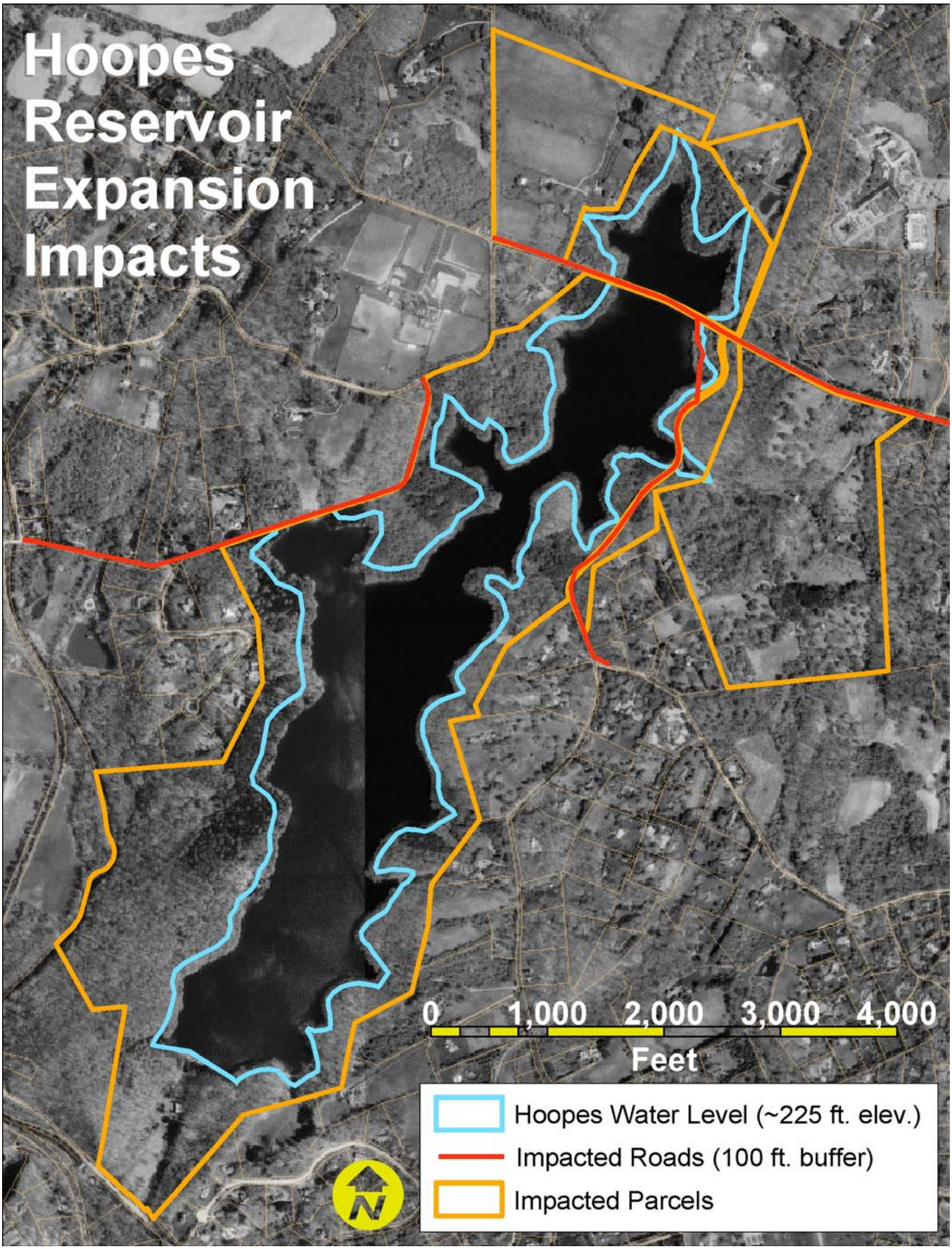


Figure 4. Projected Impacts of Hoopes Reservoir Expansion

PUBLIC WATER PRODUCTION AND DEMAND REPORT
Northern New Castle County
June-03

Water Purveyor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	AVG
City of Wilmington	**17.3**	**18.7**	**20.8**	**19.8**	**19.9**	**21.9**	**20.3**	**19.7**	**20.1**	**24.3**	**20.6**	**20.8**	**20.3**	**21.7**	**21.9**	**21.4**	**20.7**	**20.7**	**21.4**	**20.7**	**20.6**	**20.6**	**20.9**	**23.0**	**23.8**	**26.9**	**24.7**	**23.6**	**22.3**	**25.1**	**21.5**
Brandywine Filter Plant	3.6	3.3	3.6	4.5	3.9	4.1	5.8	3.9	4.0	5.8	4.8	4.1	3.8	4.5	4.7	4.7	4.7	4.9	4.9	4.8	4.8	4.7	4.6	4.7	5.7	7.1	6.8	6.4	5.4	5.7	4.8
Porter Filter Plant	13.7	15.4	17.2	15.3	16.0	17.8	14.5	15.8	16.1	18.5	15.8	16.7	16.5	17.2	17.2	16.7	16.0	15.8	16.5	15.9	15.8	15.9	16.3	18.3	18.1	19.8	17.9	17.2	16.9	19.4	16.7
Artesian Water Co.	**18.8**	**18.0**	**18.1**	**15.4**	**18.3**	**18.2**	**17.9**	**17.8**	**18.2**	**18.6**	**17.2**	**18.9**	**16.6**	**18.3**	**19.1**	**19.6**	**19.3**	**19.0**	**18.5**	**19.3**	**16.9**	**17.7**	**18.2**	**19.5**	**16.7**	**18.3**	**20.4**	**19.9**	**23.9**	**19.3**	**18.5**
Wells (North)	16.0	15.2	15.7	13.3	15.7	15.7	15.7	15.6	15.8	16.3	14.9	16.4	13.3	15.0	15.9	16.3	16.0	15.7	15.3	16.1	13.7	14.6	15.0	16.2	12.6	14.6	16.3	15.7	19.7	15.7	15.5
ASR	-0.5	-0.6	-0.9	-1.0	-0.8	-0.8	-1.0	-1.0	-0.9	-0.9	-0.9	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.9	1.0	1.0	0.4	-0.2
CWA (PA) Interconnection	3.3	3.4	3.3	3.1	3.4	3.3	3.2	3.2	3.3	3.2	3.2	3.3	3.3	3.3	3.2	3.3	3.3	3.3	3.2	3.2	3.2	3.1	3.2	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2
New Castle Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United Water Delaware	**22.1**	**21.7**	**21.3**	**21.1**	**22.3**	**22.5**	**22.0**	**21.9**	**22.5**	**24.1**	**21.8**	**21.9**	**21.2**	**18.0**	**21.5**	**22.6**	**20.5**	**21.6**	**23.9**	**21.5**	**21.3**	**24.1**	**25.0**	**24.0**	**24.0**	**26.2**	**23.3**	**24.5**	**23.2**	**23.2**	**22.5**
White Clay Cr./Stanton	19.6	20.7	17.8	17.0	18.0	18.3	17.8	17.7	18.4	19.9	20.8	17.3	17.0	17.0	17.0	18.0	16.0	17.0	19.5	17.0	17.0	19.5	20.5	19.5	19.5	21.7	18.8	19.9	18.7	18.8	18.5
- Hoopes Release	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Raw Chlorides (ppm)	36	34	33	25	26	36	31	20	23	4.9	43	39	31	28	24	23	22	34	31	24	33	29	35	40	38	45	33	20	40	36	30.6
.newport bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
.churchman's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
.tcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Christina River WTP	1.5	0.0	2.5	3.1	3.3	3.2	3.2	3.2	3.1	3.2	0.0	3.6	3.2	0.0	3.2	3.3	3.2	3.3	3.1	3.2	3.0	3.3	3.2	3.2	3.2	3.2	3.2	3.3	3.2	3.1	2.8
CWA (PA) Interconnection	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
City of Newark	**3.5**	**3.9**	**3.2**	**2.8**	**3.0**	**4.0**	**3.5**	**2.9**	**2.7**	**4.2**	**2.8**	**2.3**	**4.6**	**3.1**	**3.8**	**3.6**	**3.3**	**2.2**	**4.1**	**4.0**	**2.1**	**3.0**	**3.1**	**4.0**	**4.0**	**4.0**	**3.8**	**4.2**	**3.8**	**4.2**	**3.5**
White Clay Cr. WTP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.4	1.3	0.9	1.7	2.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.8	2.0	2.0	2.0	2.1	2.1	0.8
Wells	1.4	1.2	1.2	1.2	1.2	1.9	0.8	1.0	1.0	1.0	0.5	0.5	1.1	0.2	0.5	0.5	0.5	0.5	1.0	1.5	0.2	0.7	0.7	1.3	0.8	1.1	1.1	1.2	1.2	1.1	0.9
United Interconnection	2.1	2.7	2.0	1.6	1.8	2.1	2.7	1.9	1.7	2.3	0.9	0.5	2.6	1.2	1.3	1.2	0.9	1.7	3.1	2.5	1.9	2.3	2.4	1.6	1.4	0.9	0.7	1.0	0.5	1.0	1.7
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Castle MSC	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**
Wells	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4
Subtotal	62.2	62.8	63.8	59.6	63.9	67.0	64.1	62.7	63.8	71.5	62.8	64.3	63.1	61.4	66.7	67.6	64.2	64.0	68.3	65.9	61.3	65.8	67.6	70.9	68.9	75.8	72.7	72.7	73.7	72.2	66.4
Delaware Interconnections	-2.1	-2.7	-2.0	-1.6	-1.8	-2.1	-2.7	-1.9	-1.7	-2.3	-0.9	-0.5	-2.6	-1.2	-1.3	-1.2	-0.9	-1.7	-3.1	-2.5	-1.9	-2.3	-2.4	-1.6	-1.4	-0.9	-0.7	-1.0	-0.5	-1.0	-1.7
TOTAL DEMAND	**60.1**	**60.1**	**61.8**	**58.0**	**62.1**	**64.9**	**61.4**	**60.8**	**62.1**	**69.2**	**61.9**	**63.8**	**60.5**	**60.2**	**65.4**	**66.4**	**63.3**	**62.3**	**65.2**	**63.4**	**59.4**	**63.5**	**65.2**	**69.3**	**67.5**	**74.9**	**72.0**	**71.7**	**73.2**	**71.2**	**64.7**

Figure 5. Northern New Castle County Public Water Production Demand Report, June 2003

PUBLIC WATER PRODUCTION AND DEMAND REPORT
Northern New Castle County
July-03

Water Purveyor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVG
City of Wilmington	**24.1**	**24.6**	**23.3**	**21.4**	**26.1**	**24.2**	**26.1**	**24.7**	**24.0**	**22.5**	**22.6**	**23.5**	**22.5**	**22.1**	**23.2**	**22.5**	**24.6**	**24.9**	**22.0**	**22.9**	**23.3**	**26.0**	**23.4**	**23.6**	**26.0**	**23.9**	**24.3**	**24.8**	**24.4**	**23.2**	**24.6**	**23.8**
Brandywine Filter Plant	5.6	5.6	5.3	5.4	7.2	7.3	6.3	5.6	5.4	4.7	4.8	5.8	4.9	4.6	4.8	4.4	4.6	4.8	4.1	4.9	4.9	4.7	4.9	5.8	6.2	5.7	5.7	5.3	5.2	4.9	5.3	5.3
Porter Filter Plant	18.5	19.0	18.0	16.0	18.9	16.9	19.8	19.1	18.6	17.8	17.8	17.7	17.6	17.5	18.4	18.1	20.0	20.1	17.9	18.0	18.4	21.3	18.5	17.8	19.8	18.2	18.6	19.5	19.2	18.3	19.3	18.5
Artesian Water Co.	**19.9**	**22.5**	**20.7**	**20.4**	**20.3**	**18.7**	**22.2**	**19.9**	**18.8**	**18.8**	**16.2**	**19.0**	**20.1**	**20.8**	**18.8**	**20.6**	**20.6**	**21.0**	**21.3**	**20.1**	**20.0**	**20.7**	**22.0**	**20.3**	**21.8**	**21.8**	**19.8**	**20.7**	**19.2**	**20.2**	**20.2**	**20.2**
Wells (North)	15.7	17.0	15.3	15.3	15.2	13.7	16.3	15.4	14.8	14.7	11.9	14.7	15.9	16.5	14.6	16.4	16.4	16.7	17.1	15.9	15.6	16.4	16.9	15.3	16.4	16.2	14.8	15.9	14.8	15.9	15.9	15.6
ASR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.9	1.1	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	0.9	0.9	1.0	1.0	1.0	1.0	1.0
CWA (PA) Interconnection	3.2	3.3	3.2	3.3	3.3	3.1	3.2	3.4	3.2	3.2	3.2	3.3	3.3	3.4	3.2	3.2	3.2	3.3	3.2	3.2	3.4	3.3	3.3	3.2	3.3	3.3	3.3	3.4	3.4	3.3	3.3	3.3
New Castle Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	1.2	1.2	0.8	0.8	0.9	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.4	0.8	0.4	0.0	0.0	0.0	0.4
United Water Delaware	**22.6**	**23.1**	**22.2**	**22.5**	**21.7**	**17.5**	**23.3**	**24.8**	**24.0**	**22.9**	**24.1**	**22.3**	**22.7**	**21.7**	**22.4**	**24.5**	**24.8**	**22.7**	**22.6**	**22.5**	**23.4**	**24.1**	**21.6**	**22.2**	**22.6**	**23.1**	**23.6**	**24.1**	**23.2**	**22.8**	**23.2**	**22.9**
White Clay Cr./Stanton	18.4	18.9	18.0	18.2	20.7	16.5	19.1	20.6	19.8	18.6	19.9	18.2	19.2	20.7	17.9	20.0	20.4	18.2	18.3	17.9	18.8	21.8	20.3	19.4	18.1	18.7	19.1	19.8	19.0	18.7	19.2	19.1
- Hoopes Release	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Raw Chlorides (ppm)	39	30	37	40	36	31	34	43	40	44	41	41	37	39	38	35	43	37	39	39	39	43	34	37	38	42	39	42	44	41	42	38.8
.newport bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
.churchman's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
.tcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Christina River WTP	3.2	3.2	3.2	3.2	0.0	0.0	3.2	3.2	3.2	3.3	3.2	3.1	2.5	0.0	3.2	3.2	3.1	3.2	3.0	3.3	3.3	1.0	0.0	1.5	3.2	3.1	3.2	3.0	3.2	3.1	3	2.6
CWA (PA) Interconnection	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1	1.1
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
City of Newark	**2.1**	**4.1**	**2.9**	**4.0**	**4.0**	**3.3**	**3.1**	**3.6**	**4.7**	**4.0**	**3.5**	**4.2**	**2.6**	**3.7**	**2.1**	**3.5**	**4.9**	**4.0**	**4.7**	**3.8**	**3.9**	**4.2**	**4.2**	**3.5**	**4.6**	**3.9**	**4.2**	**4.3**	**4.3**	**4.0**	**3.8**	**3.8**
White Clay Cr. WTP	0.0	1.7	1.8	1.9	2.0	2.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	2.5	2.2	2.1	2.3	2.2	1.8	2.4	2.0	2.2	2.0	2.0	2.1	0.9	1.3
Wells	1.1	1.1	0.6	1.1	1.1	0.7	0.7	0.8	1.9	1.4	1.4	1.9	1.0	1.6	1.6	1.3	2.1	1.4	1.4	0.5	0.5	1.1	1.2	1.2	1.2	1.2	1.3	1.8	1.3	1.0	1.0	1.2
United Interconnection	1.0	1.3	0.5	1.0	0.9	0.5	1.4	2.8	2.8	2.6	2.1	2.3	1.6	2.1	0.5	2.2	1.8	0.6	0.8	1.1	1.3	0.8	0.8	0.5	1.0	0.7	0.7	0.5	1.0	0.9	1.9	1.3
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Castle MSC	**0.4**	**0.5**	**0.5**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**1.0**	**0.8**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.4**	**0.5**
Wells	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.6	1.0	0.8	0.4	0.4	0.4	0.5	0.5	0.4	0.5
Subtotal	69.1	74.7	69.6	68.7	72.6	64.1	75.1	73.4	71.9	68.7	66.8	69.4	68.2	68.7	66.9	71.7	75.4	73.0	71.0	69.7	71.1	75.5	71.8	70.6	75.8	73.1	72.3	74.3	71.6	70.7	72.2	71.2
Delaware Interconnections	-1.0	-2.5	-1.7	-1.8	-1.7	-1.4	-3.1	-2.9	-2.8	-2.6	-2.1	-2.3	-1.6	-2.1	-0.5	-2.2	-1.8	-0.6	-0.8	-1.1	-1.3	-0.8	-1.6	-1.3	-2.0	-2.1	-1.5	-0.9	-1.0	-0.9	-1.9	-1.7
TOTAL DEMAND	**68.1**	**72.2**	**67.9**	**66.9**	**70.9**	**62.7**	**72.0**	**70.5**	**69.1**	**66.1**	**64.7**	**67.1**	**66.6**	**66.6**	**66.4**	**69.5**	**73.6**	**72.4**	**70.2**	**68.6**	**69.8**	**74.7**	**70.2**	**69.3**	**73.8**	**71.0**	**70.8**	**73.4**	**70.6**	**69.8**	**70.3**	**69.5**

Figure 6. Northern New Castle County Public Water Production Demand Report, July 2003

Water Purveyor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVG
City of Wilmington	**23.0**	**22.8**	**22.9**	**23.1**	**23.0**	**22.8**	**22.7**	**22.7**	**21.8**	**22.0**	**23.0**	**21.7**	**23.8**	**23.4**	**24.1**	**21.9**	**21.4**	**23.3**	**24.4**	**23.9**	**25.9**	**25.1**	**23.1**	**22.6**	**22.7**	**24.0**	**25.1**	**25.2**	**24.1**	**25.1**	**22.3**	**23.3**
Hoopes Reservoir Water Level (ft)																																
Hoopes Release to Wilmington (mgd)																																
Brandywine Filter Plant	5.0	5.2	5.3	5.0	5.0	4.9	5.3	5.1	5.0	5.0	4.9	5.1	4.9	5.1	4.8	4.4	5.0	5.8	4.9	5.8	5.8	5.3	4.8	4.9	5.3	5.9	6.0	5.9	5.3	6.1	5.3	5.2
Porter Filter Plant	18.0	17.6	17.6	18.1	18.0	17.9	17.4	17.6	16.8	17.0	18.1	16.6	18.9	18.3	19.5	17.5	18.4	17.7	19.5	18.3	20.1	19.8	18.2	17.7	17.4	18.9	19.1	19.3	18.8	19.0	17.0	
Artesian Water Co.	**18.9**	**18.3**	**19.1**	**18.6**	**19.3**	**17.9**	**20.0**	**18.7**	**18.7**	**17.4**	**20.2**	**19.0**	**18.9**	**18.9**	**22.9**	**17.5**	**17.7**	**19.6**	**19.7**	**24.9**	**18.7**	**18.9**	**18.0**	**19.2**	**20.7**	**21.5**	**17.8**	**18.8**	**18.8**	**19.3**	**18.6**	**19.2**
Wells (North)	15.0	14.1	14.9	14.0	15.0	13.9	15.6	14.4	14.4	13.1	15.8	14.7	14.5	14.6	17.4	13.4	13.3	15.3	15.3	20.5	14.3	14.8	14.1	14.9	16.2	17.4	13.6	14.5	14.7	14.5	13.8	14.9
ASR	1.0	1.0	1.0	1.3	1.1	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	0.7	1.0	1.0	0.9	1.0	1.1	0.9	1.0	1.0	1.1	0.9	1.0	1.0	1.0	1.0	1.0	1.0
CWA (PA) Interconnection	2.9	3.2	3.2	3.3	3.2	3.2	3.4	3.3	3.3	3.3	3.4	3.3	3.4	3.3	3.5	3.4	3.4	3.3	3.5	3.4	3.3	3.2	2.9	3.3	3.4	3.2	3.2	3.3	3.1	3.0	3.1	3.3
New Castle Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.0
United Water Delaware	**23.5**	**20.8**	**18.8**	**20.8**	**21.1**	**20.4**	**20.2**	**21.1**	**19.7**	**21.5**	**19.8**	**21.8**	**21.6**	**22.5**	**21.3**	**20.6**	**21.3**	**21.4**	**20.7**	**21.1**	**22.8**	**23.4**	**21.6**	**22.4**	**20.9**	**20.9**	**20.1**	**21.6**	**21.9**	**19.9**	**21.0**	**21.2**
White Clay Cr./Stanton	19.0	19.0	17.5	19.0	16.9	16.3	15.9	16.6	15.4	17.1	15.5	17.6	17.2	19.2	17.2	16.4	17.0	17.2	16.6	16.9	18.5	18.3	17.4	18.4	16.9	17.0	16.2	17.8	18.0	15.9	17.2	17.2
- Hoopes Release (mgd)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Intake Chlorides (ppm)	36	34	42	40	35	39	47	34	33	32	30	32	38	39	45	39	40	35	39	40	44	40	37	42	35	41	44	35	31	39	39	38
- Plant Effluent Chlorides (ppm)																																
newport bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
churchman's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Christina River WTP	3.2	1.5	0.0	1.5	2.9	2.8	3.0	3.2	3	3.1	3.0	2.8	3.1	3.0	3.1	3.2	3.3	3.2	3.1	3.2	3.3	3.1	3.2	3.0	3.0	2.9	2.9	3.0	2.9	3.0	3	2.9
CWA (PA) Interconnection	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
City of Newark	**4.3**	**3.7**	**3.4**	**3.4**	**4.0**	**4.2**	**3.3**	**4.0**	**3.8**	**3.5**	**5.5**	**4.0**	**4.2**	**4.1**	**3.9**	**3.9**	**3.8**	**4.0**	**3.8**	**4.1**	**4.2**	**4.8**	**4.0**	**3.9**	**3.9**	**5.0**	**3.7**	**3.5**	**4.2**	**3.4**	**3.7**	**4.0**
White Clay Cr. WTP	0.5	1.4	2.1	2.1	2.1	2.6	1.6	2.0	2.0	0.0	0.0	0.0	0.0	1.0	2.1	2.1	2.0	2.2	2.0	2.3	2.3	2.3	2.2	2.1	2.2	2.0	2.0	1.8	2.0	1.6	0.3	1.6
Wells	1.4	0.8	0.8	0.8	1.1	1.1	1.1	1.1	1.1	1.0	1.5	2.0	2.0	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.4	2.0	1.3	1.3	1.2	1.8	1.2	1.2	1.3	1.1	1.1	1.3
United Interconnection	2.4	1.7	0.7	0.7	0.8	0.5	0.6	0.9	0.7	2.5	4.0	2.0	2.2	1.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.2	0.5	0.5	0.9	0.7	2.3	1.1
Artesian Interconnection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
New Castle MSC	**0.5**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Wells	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Subtotal	70.2	66.0	64.6	66.2	67.8	65.7	66.6	66.9	64.4	64.7	68.9	69.9	68.9	69.3	72.6	64.3	64.6	68.7	69.1	74.5	72.0	72.6	67.2	68.6	68.7	72.6	67.1	69.5	69.4	68.1	66.0	68.2
Delaware Interconnections	-2.4	-1.7	-0.7	-0.7	-0.8	-0.5	-0.6	-0.9	-0.7	-2.5	-4.0	-2.0	-2.2	-1.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-1.2	-0.5	-0.5	-0.9	-1.5	-3.0	-1.1
TOTAL DEMAND	**67.8**	**64.3**	**63.9**	**65.5**	**67.0**	**65.2**	**66.0**	**66.0**	**63.7**	**62.2**	**64.9**	**64.9**	**66.7**	**67.6**	**72.1**	**63.8**	**64.1**	**68.2**	**68.6**	**74.0**	**71.5**	**72.1**	**66.7**	**68.1**	**68.2**	**71.4**	**66.6**	**69.0**	**68.5**	**66.6**	**63.0**	**67.0**

Figure 7. Northern New Castle County Public Water Production Demand Report, August 2003