Reservoir Dogs, Redux

Report to the
Delaware Water Supply Coordinating Council

January 20, 2022

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University of Delaware
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Over the 22 years since the Delaware Water Supply Coordinating Council was appointed by Governor's Executive Order No. 74 on Jan 1, 2000 there have been:

5 DNREC Secretaries

4 Governors

3 State Geologists

2 State Climatologists

1 Temporary Water Coordinator

Watershed Management

Practice, Policies, and Coordination

Robert J. Reimold
Editor

1998

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16
Anatomy of a Drought

Gerald J. Kauffman
Water Resources Agency
Newark, Delaware

Introduction

The drought of 1995 was a significant event which severely reduced the availability of public water supplies in northern New Castle County (Delaware). The year-long drought was characterized by an extended period of deficit precipitation which resulted in near-record low stream flows in the Christiana watershed, declining groundwater levels, and a depleted Hoopes Reservoir (see Figs. 16.1 and 16.2). The dry conditions reduced the availability of stream flows for water supply purposes, nearly resulting in water shortages just after Labor Day in 1995. Fortunately, record rainfall during October averted the water emergency, and water conditions returned to normal.

The drought created hardships for the citizens and businesses of New Castle County, yet it highlighted opportunities for improvement of the regional water supply system. The following summary discusses the chronology of the drought and various drought management activities by state, county, local, and private water agencies. More importantly, this chapter discusses the lessons and actions which are needed to improve watershed management activities for future droughts.

been in effect for the last 7 months. At the end of February, hydrologic indicators registered above normal, indicating the end of the drought.

Drought Coordination

Drought coordination activities were administered by three committees which worked to avert a water shortage in New Castle County. The responsibilities of these committees included monitoring of water conditions, coordination of water supplies between the utilities, and declaration of drought warnings and water restrictions. The activities of the drought coordination committees are described below.

Christina Basin Drought Management Committee (CBDMC)

This committee consists of state and county agencies and public and private water utilities in the Pennsylvania and Delaware portions of Christina Basin. The purpose of the CBDMC is to coordinate interstate drought management activities within Christina Basin in Pennsylvania, which provides 40 percent of the water for Chester County, and Delaware, which provides 70 percent of the water for New Castle County. Significant actions by the CBDMC during the drought of 1995 included recommendations to convene the governor's drought advisory committee, negotiations between Delaware and Pennsylvania for an emergency release from Marsh Creek Reservoir, support of interstate interconnections to Delaware from the Chester Water Authority, and support of Newark request to DRBC to temporarily relax in-stream flow requirements along White Clay Creek during the drought in September (see Figs. 16.9 and 16.10).

Governor's Drought Advisory Committee

The governor's drought advisory committee (DAC) was formed by executive order by the governor of Delaware. The DAC consists of the governor's office, state cabinet officials, and invited local agencies and water utilities. The purpose of the DAC is to monitor water conditions and recommend declaration of drought warning or emergency and/or voluntary or mandatory water restrictions when appropriate. The governor's DAC was chaired by the chief of staff and met weekly during the drought of 1995.

Water Resources Technical Coordinating Committee

The Water Resources Technical Coordinating Committee (WRTCC) met almost weekly to coordinate the technical aspects of the drought. The WRTCC was convened at the offices of the Water Resources Agency for New Castle County and consisted of the state, county, and public and private water utilities. At the weekly technical meetings, the agencies and utilities shared information on water conditions involving precipitation, stream flow, groundwater levels, and reservoir levels. Water supply production and demand summaries were prepared daily and distributed for drought coordination. In addition, the WRTCC conducted activities including recommendations regarding water restrictions by individual utilities, evaluations of Hoopes Reservoir, development of emergency water supply contingencies, and evaluation of worst-case drought scenarios.

Lessons and Actions

The drought of 1995, while it caused many water supply hardships, provided a learning experience which can enhance our abilities to cope with future droughts. The drought provided certain lessons and actions which can be logically grouped into watershed-based physical, institutional, policy, and public education categories. The water resources community in Delaware was urged to consider the following recommendations to improve drought management activities in the future.

Physical

Need for additional water supply. The drought emphasized the need for an additional, permanent, reliable, in-state source of sustainable water supply to meet the recognized deficit of 20 Mgal/day in northern New Castle County. This area lacks adequate storage to replenish surface water supplies during periods of low stream flow. The Churchmans Environmental Impact Statement (EIS) should proceed with all due speed to permit, design, and construct a reservoir by the end of this century.

Brandywine–Hoopes–Red Clay system. There were concerns during the drought regarding the adequacy of the Brandywine–Hoopes Reservoir–Red Clay system. The city of Wilmington experienced difficulty withdrawing water from Brandywine Creek during record low stream flow levels. There were questions regarding the actual capacity and con-

ditions of pumps which withdraw water from Brandywine Creek and fill and drain Hoopes Reservoir. An infrastructure assessment should be conducted to evaluate the capacity and condition of gates, canals, tailraces, pump stations, and pipelines in this vital system.

Hoopes Reservoir operating plan. During the drought, there were questions about the actual capacity of Hoopes Reservoir and whether sufficient storage was available for Wilmington and United Water Delaware through the end of the drought. There were questions regarding the capacity of the reservoir depending on the condition of the outlet gates, accumulated sediment in the impoundment, and water quality based upon predicted high levels of manganese at lower depths. When Hoopes reached 55 percent of capacity, the city ceased releases to United Water Delaware to reserve the balance of storage for the city during continuing drought. A Hoopes Reservoir operating plan should be developed which addresses the questions about actual volume, outlet structure condition, and water quality. The plan should specify written operating guidelines, similar to those for Marsh Creek Reservoir, which dictate storage commitments and required releases for the city of Wilmington and United Water Delaware during normal and drought periods.

Interconnected network. The interconnected network was one reason that a water shortage was averted in northern New Castle County. During the critical dry period in early September 1995, up to 5 Mgal/day was transferred between the utilities to meet demand in service areas of short supply. Artesian Water Company installed three emergency interconnections which conveyed 2 Mgal/day to United Water by reversing pumps and laying new mains. A hydraulic evaluation should be conducted to identify opportunities for increased interconnections between the utilities during normal and drought emergency periods. Also, formal interconnection agreements should be prepared by the utilities which specify capacity, duration, and financial arrangements during normal and drought periods.

Interim water supply alternatives. The drought highlighted the need to develop all possible water supplies to meet deficits over the next few years. The following projects should be developed to maximize water supplies over the next several years until a regional water supply alternative is implemented by the Churchmans EIS:

- Continued CWA interconnections from Pennsylvania
- UWD tidal enhancement structure along White Clay Creek
- Water treatment plant at Newark south well field

Stream gauging. During the drought, the media incorrectly reported problems at the gauge along Brandywine Creek at Wilmington during record low stream flows. The Delaware Geological Survey performed outstanding work by continuing difficult stream gauging measurements during record low flows when levels dropped "off the chart."

Institutional

Drought emergency preparedness plan. The critically low water supply conditions emphasized the need to prepare a statewide drought emergency preparedness plan. Such a plan should be prepared by the Delaware Emergency Management Agency (DEMA) and should describe emergency water supplies (tankers, desalting plants, etc.), priority service areas (nursing homes, hospitals, etc.), and a chain of command for drought coordination during an emergency. The drought emergency plan should be similar in scope and scale to the plans prepared for floods, fires, snowstorms, and other natural disasters.

Marsh Creek Reservoir accord. During the critical drought period in early September, Delaware requested Pennsylvania to provide an emergency release from Marsh Creek into Brandywine Creek for capture by the city of Wilmington. While the terms of the release were being negotiated, the drought eased, stream flows increased and the emergency release from Marsh Creek was deemed no longer necessary. While in a nondrought period, the two states should finalize the paperwork regarding an emergency release from Marsh Creek, should it be needed in the future. The agreement should specify that a release would be requested only as a contingency, in an emergency, and only as a last resort to supplement low flows in Brandywine Creek at Wilmington.

Water master. During the drought emergency, there was debate and difficulty allocating stream flows, withdrawals, and reservoir storage for use by water suppliers with the greatest need. In the Delaware River basin, a "river master" is appointed as an impartial party to equitably apportion stream flow, withdrawals, and reservoir storage in accordance with negotiated agreements. A similar impartial position, perhaps a "water master," should be considered to allocate water supplies during a drought emergency in Christina basin. The water master would be appointed as a position within DEMA with duties specified through negotiated agreements among public agencies and the water utilities.

Relaxed water standards. A water shortage in northern New Castle County was averted partially through the relaxation of water standards during the drought emergency. Water utilities were permitted to temporarily exceed well allocation standards. Drinking water standards for sodium and chlorides were exceeded for two weeks in White Clay Creek due to lack of freshwater flow. Minimum in-stream flow standards were waived during the duration of the drought emergency along White Clay Creek at the Newark WTP and the UWD Stanton Filter Plant. Additional storage is needed to supplement existing water supplies so water quantity and quality standards are not compromised during future droughts.

Policy

Three-phase drought declaration. The drought outlined the need to update the DNREC drought management plan. The current plan specifies a two-phase drought declaration (warning and emergency) which provides little opportunity for an early public "advisory" and is inconsistent with the existing three-phase drought declaration policy in use by neighboring Chester County, Pennsylvania. The following three-phase drought declaration policy should be developed in Delaware depending on the severity of water conditions:

- Advisory (voluntary restrictions)
- Warning (voluntary restrictions)
- Emergency (mandatory restrictions)

Public notice for drought emergency and mandatory restrictions. The current Delaware drought management plan specifies a minimum 20-day public notice period before a drought emergency and mandatory restrictions can be declared by the governor. The recent drought indicated that water conditions can decline from warning to emergency status more rapidly than 20 days. A shorter public notice period, say 7 days, should be instituted to permit a more expedient declaration of drought emergency and mandatory restrictions in the event of rapidly declining water conditions.

Drought forecast index. The current DNREC drought forecast index (bowling chart) measures only Brandywine Creek and precipitation levels as indicators of water conditions in northern New Castle County. The recent drought exemplified the need to monitor other water conditions such as groundwater and reservoir levels as indicators of impending drought. The DNREC drought forecast index should be revised to incorporate factors based on

- Precipitation
- Soil moisture
- Stream flow
- Groundwater level
- Reservoir level

Drought emergency expiration. While the policies for entering a drought are well defined, there is no clear policy for expiration of a drought emergency or warning. An automatic expiration date should be included in a governor's drought emergency executive order to avoid the embarrassment of calling off a drought during a wet period.

Public education

Drought education. The recent drought illustrated public misconceptions about the need to order mandatory restrictions and declare drought emergency. A public education program should be enacted to inform the public about watershed-based drought management and water conservation activities.

Media visibility and relations. Considerable television and newspaper coverage was provided during this drought (see Fig. 16.11). Most of the media coverage was desirable, to communicate the need to conserve water. However, certain articles were not factual and created a false public perception regarding the competence of drought management activities by public agencies and the utilities.

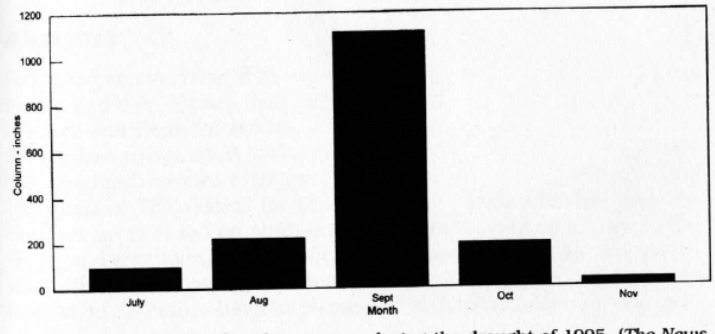


Figure 16.11 Extent of media coverage during the drought of 1995. (*The News Journal, Wilmington, Delaware.*)

Aug 27, 1999

STATE OF DELAWARE

EXECUTIVE DEPARTMENT

DOVER

EXECUTIVE ORDER
NUMBER SIXTY-FIVE

TO: HEADS OF ALL STATE DEPARTME TS, AGENCIES AND AUTHORITIES, AND ALL POLITICAL SUBDIVISIONS AND GOVERNMENTAL UNITS OF TI-IE STATE OF DELAWARE.

RE: AME DMENT TO EXECUTIVE ORDER NUMBER SIXTY-TWO, AS AMENDED BY EXECUTIVE ORDER NUMBER SIXTY-THREE AND EXECUTIVE ORDER NUMBER SIXTY-FOUR, REGARDI G THE STATE OF EMERGENCY DUE TO DROUGHT EMERGENCY; ISSUING AN EMERGENCY ORDER IMPOSING MANDATORY WATER CONSERVATION MEASURES; CREATING THE WATER SUPPLY TASK FORCE; A 1D OTHER RELATED ACTIO .

WHEREAS, on July 23. 1999, by Executive Order Number Sixty-One, I proclaimed a drought warning for the State of Delaware and urged specific voluntary conservation measures;

WHEREAS, on August 5, 1999, by Executive Order Number Sixty-Two, I proclaimed a state of emergency due to drought and imposed certain mandatory conservation measures;

WHEREAS, on August 6, 1999, by Executive Order Number Sixty-Three, I amended Executive Order number Sixty-Two;

WHEREAS, on August 20, 1999, by Executive Order Number Sixty-Four, I fmther amended Executive Order number Sixty-Two;

WHEREAS, Delaware and the region continue to experience severe drought conditions, including below normal precipitation and stream flow;

WHEREAS, the need to reduce the demand for fresh water has not diminished;

WHEREAS, the use of non-potable water, such as pool water and treated wastewater, wherever possible will help reduce demand;

WHEREAS, the fall spo1ls season is approaching and the use of potable water for school athletic fields where necessary is appropriate to prevent injuries;

5. Industrial and commercial water users in northern New Castle County are directed to reduce their level of water usage by twenty percent, wherever practical, through the implementation of effective water conservation practices and the use of alternative water supplies which reduce demand on the potable water supplies of water utilities. Upon request by the DNREC, industrial and commercial water users in northern New Castle County shall produce records and reports certifying the water usage reductions achieved.

6. Law enforcement authorities of this State and of the political subdivisions of this State shall enforce this Emergency Order and may issue citations for violations thereof pursuant to 20 Del. C. § 3125. Law Enforcement officers may, in addition to issuing a summons for any such violation, provide the violator with a voluntary assessment pursuant to the prescribed procedure under 7 Del. C. § 6061. Law enforcement may enforce the provisions provided herein, with or without a warrant, as long as such officer has reasonable ground to believe that the person has violated the terms of this order, even if such violation has occurred outside of the officer's presence. The justices of the peace shall have original jurisdiction to hear, try and finally determine any violation of the terms of this order.

7. Water allocation permit holders who are providing or who hereafter commit to provide potable water to utilities which provide water for domestic purposes in northern New Castle County shall, on a case-by-case basis as determined by DNREC, have said permit limits suspended for the purpose of maximizing public water supply. Such suspensions shall remain in effect until further Order of the Governor or of the Secretary of DNREC.

8. The Drought Advisory Committee shall continue to consult with municipalities and other relevant agencies and organizations, both public and private, in carrying out the above-described activities.

9. All citizens of Delaware are urged to follow the conservation practices set forth in Paragraph 4 of this Order in order to avoid shortages similar to those being experienced in northern New Castle County."

B. The Water Supply Task Force is hereby established:

1. The Water Supply Task Force shall consist of members appointed by the Governor representing agencies and entities providing and regulating the water resources of this State;

2. The Chairperson shall be appointed by the Governor from any member of the Water Supply Task Force;

3. The Water Supply Task Force shall review Delaware's current and projected water supply along with current and projected demand;

4. The Water Supply Task Force shall provide recommendations to the Governor concerning long-term solutions to Delaware's water supply needs, both in terms of normal weather conditions and severe drought conditions; and

5. The Water Supply Task Force may establish subcommittees under the leadership of the Task Force members to conduct activities of the Task Force.

C. The provisions of this Order shall be effective as of 12:01 p.m., August 27, 1999.

Approved this 27th day of August, 1999.

Governor

Attest:

Secretary of State

Dec 2, 1999

FINAL REPORT

GOVERNOR'S WATER SUPPLY TASK FORCE

December 2, 1999

Prepared by:

Water Resources Agency, Institute for Public Administration,
University of Delaware

Delaware Geological Survey

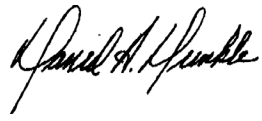
Delaware Department of Natural Resources and Environmental Control

FINAL REPORT
GOVERNOR'S WATER SUPPLY TASK FORCE

December 2, 1999

This report was prepared and approved by the Governor's Water Supply Task Force in accordance with Executive Order No. 65. The members of the task force are in general concurrence and agree in principal with the findings and recommendations of the report as attested by:

Jeffrey W. Bullock
Governor's Chief of Staff



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Nicholas A. DiPasquale
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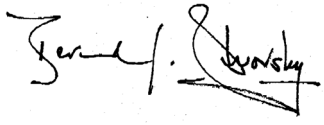

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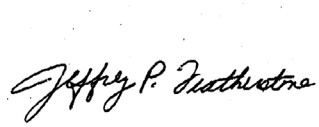
County Executive
New Castle County



Jeffrey P. Featherstone
Deputy Executive Director
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Dian C. Taylor
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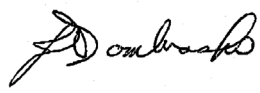
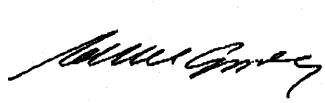
Artesian Water Company



Joseph A. Dombrowski
Director, Water Department
City of Newark

Kash Srinivasan
Commissioner, Department of
Public Works
City of Wilmington



Robert S. Appleby
President
New Castle Board of Water & Light

FINAL REPORT
GOVERNOR'S WATER SUPPLY TASK FORCE
EXECUTIVE SUMMARY
December 2, 1999

Introduction

The century-ending drought of 1999 was a severe meteorological event, which threatened to interrupt the availability of water supply in Northern New Castle County, Delaware. On August 5, 1999 Governor Carper, at the recommendation of his Drought Advisory Committee, declared a Drought Emergency with mandatory water restrictions in Northern New Castle County. The drought ended in September 1999 with the rains of hurricanes Dennis and Floyd.

During the drought emergency, Governor Carper signed Executive Order No. 65 which appointed a Water Supply Task Force composed of State, Regional, and County agencies and five public and investor-owned water purveyors serving north of the C & D Canal. The charge to the Task Force as summarized in this report was to evaluate the effects of the drought, update the supply and demand curves, and recommend solutions to close the gap between supply and demand in Northern New Castle County during droughts. The task force met on September 14, October 1, October 21, November 5, and November 18, 1999.

Supply and Demand

The Task Force reviewed estimates of supply and demand for worst case drought conditions for planning years 2000, 2010, and 2020. The supply-side estimates involved three scenarios based on assumptions for minimum instream flow standards: (1) Drought Emergency – No 7Q10 minimum flow standard along the Brandywine Creek at Wilmington and White Clay Creek at Stanton, (2) Existing Regulatory Condition – No 7Q10 minimum flow standard along the Brandywine Creek but the 7Q10 standard is in effect along the White Clay Creek, and (3) Future Condition – 7Q10 minimum flow standards in effect along Brandywine Creek and the White Clay Creek. The demand-side estimates were obtained from maximum monthly demand data compiled in the Merna Hurd report in 1998. The supply and demand curves for Northern New Castle County forecast a deficit of 17 mgd or 1020 million gallons (mg) during a 60-day drought period by year 2020 assuming 7Q10 minimum instream flow standards are in effect along both streams.

Scenario Year 2020	Supply (mgd)	Demand (mgd)	+/- (mgd)	Volume (mg)
1. No 7Q10 Flow Standard	93	90	+3	+180
2. 7Q10 along WCC only	85	90	-5	-300
3. 7Q10 along BRCR and WCC	73	90	-17	-1020

Future Water Supply Options

The Task Force then compiled a list of future water supply options available to close the 17-mgd (1020 mg) gap between supply and demand in Northern New Castle County by the year 2020. The following "A" list represents the water supply options which are committed to be installed by the water providers, have few environmental and technical constraints, enjoy community support, and can be implemented in the near term in 1 to 3 years:

A. Future Water Supply Options – Committed to by Water Providers

Newark Reservoir	200 mg	3 mgd
Wilmington Access Hoopes Reservoir Deep Storage[1]	500 mg	8 mgd
United Water Delaware Storage Lagoon - B[2]	25 mg	1 mgd
Artesian Water Co. New Wells N. of the C&D Canal[3]	120 mg	2 mgd
Newark South Wellfield Iron Treatment Plant	60 mg	1 mgd
Artesian Water Co. Aquifer Storage and Recovery Wells	300 mg	5 mgd
Total:	1205 mg	20 mgd

The following "B" list involves water options which can be achieved over a longer term but have technical, cost, environmental and/or policy obstacles that must be addressed:

B. Future Water Supply Options – Achievable in Longer Term

Increase CWA to AWC interconnection	180 mg	3 mgd
Wilmington Raise Hoopes Reservoir Water Level[4]	300 mg	5 mgd
UWD Bread and Cheese Island Reservoir	500 mg	8 mgd
Artesian Water Co. C&D Canal Pipeline[5]	300 mg	5 mgd
Philadelphia to Delaware Pipeline	1200 mg	20 mgd
Total	2480 mg	41 mgd

[1] Subject to financial investment by the public sector and/or water sale agreements with public and private water utilities.

[2] Subject to fiscal and prudency review when compared to other viable options

[3] Subject to the groundwater modeling study by the U.S. Army Corps of Engineers in the year 2000

[4] Subject to financial investment by the public sector and/or water sale agreements with public and private water utilities.

[5] Subject to review of DNREC policy regarding water supply in Southern New Castle County.

And the following "C" list involves water options that are have significant environmental, cost (high), community support (lack of), and technical constraints, and are less likely to be achieved:

C. Future Water Supply Options - Longer Term, Significant Constraints

Wilmington Blue Ball Reservoir	350 mg	6 mgd
Artesian Reservoir	900 mg	15 mgd
Thompson Station Reservoir	1200mg	20 mgd
Regional Desalination Facility	1200mg	20 mgd
(Reverse osmosis may be feasible in the future for individual purveyors)		
Indirect Wastewater Reuse	1200mg	20 mgd

Conclusions/Recommendations

The Task Force reviewed and recommended the following institutional/governance/ policy changes that will increase the supply of water and allow for more efficient management and apportionment of water supply in Delaware:

1. Temporary Water Master:

   Appoint an interim water master or central coordinator who would ensure that the "A" list committed to projects and possibly the "B" list projects are implemented according to an agreed upon schedule without slippage. The water coordinator would concentrate efforts on ensuring that providers with supply needs take the appropriate and necessary actions to address their supply deficit. The water coordinator would provide quarterly progress reports to the Governor and Legislature which would include regular updates to this Water Supply Task Force Report as new information is developed.

2. Water Supply Coordinating Council:

   Appoint a Water Supply Coordinating Council composed of State, Regional, New Castle County officials, the five water providers, and the public to work with the water coordinator to implement the water supply options. This forum would be established to offer the five water purveyors the further opportunity to communicate, coordinate, and exchange information as a positive step to better manage water supplies.

   The Artesian Water Company has voiced concerns about the need for a Water Supply Coordinating Council and indicated that the appointment of a water coordinator alone would be sufficient.

The Governor's Water Supply Coordinating Council would be appointed to perform the following specific functions:

- Work cooperatively with the interim water coordinator to implement the "A" list (committed to) and possibly "B" list (longer term) future water supply options in accordance with an agreed upon schedule.

- Conduct hydraulic field tests and/or modeling to optimize and expand the intra-county interconnections to convey water from suppliers with excess capacity to suppliers in need of additional water to meet peak demands during normal and drought periods.

- Encourage the water providers (if they do not have them) to adopt inclining block and/or conservation water rates as a demand side management measure in a manner that does not hinder economic development in New Castle County.

- Work with the utilities to develop cooperative cost and capacity agreements to purchase water supplies during drought.

- Advise the DNREC and provide technical input to ensure the completion of the recently authorized U.S. Corps of Engineers Groundwater Availability Study for Northern New Castle County.

- Review the policy decision made by DNREC to reserve water supply in Southern New Castle County vis-à-vis the C&D Canal Pipeline in light of recent demand and supply analysis and the changing socioeconomic character of Southern New Castle County.

- Develop a water quality sampling plan for Hoopes Reservoir.

3. Overhaul CPCN Process:

   Propose legislation to overhaul the Certificate of Public Convenience and Necessity (CPCN) regulations to tie the awards of new and existing water supply franchise areas to certification by the water purveyor of adequate capacity, pressure, quality, and master plans. Currently the DNREC CPCN regulations require only approval by a property owner and a boundary drawn on a map to award a franchise area to a water purveyor.

   The CPCN language would be revised to relinquish existing service areas or prevent award of future service areas to utilities that do not provide adequate water supply quantity and quality to customers during peak demand and normal or drought (low flow) conditions.

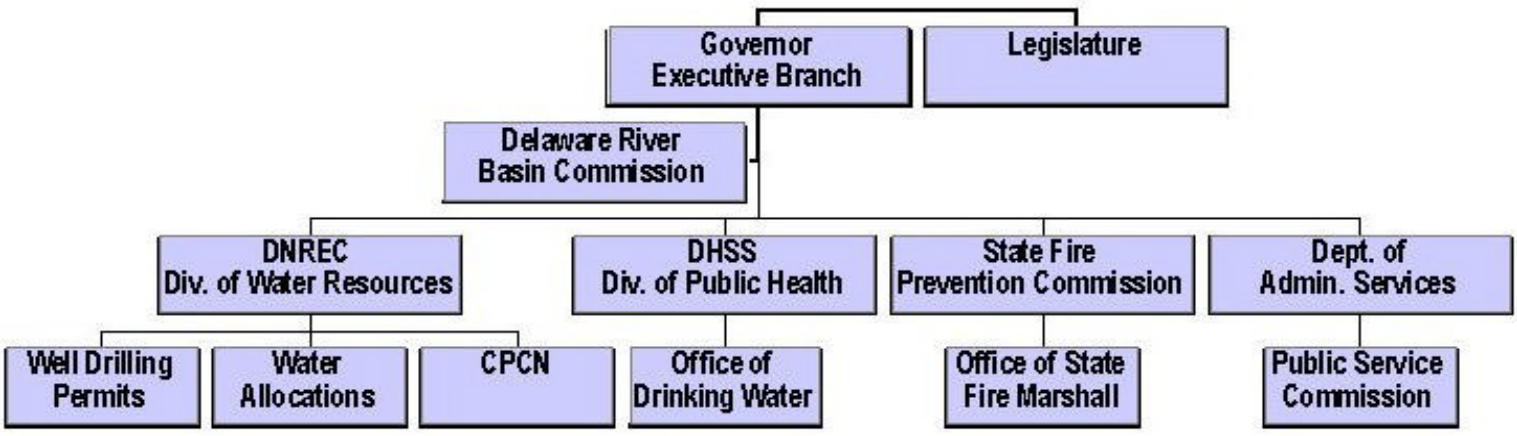
   As a further move to strengthen the process, consider moving the water supply CPCN process from DNREC to the Public Service Commission since the PSC currently has regulatory oversight of water rates and consumer service. The amended CPCN

legislation should include the following checklist tying the approval of water service areas to:

- Regional water planning.
- Certification that the water purveyor has adequate capacity to meet existing peak demands and is working toward meeting future peak monthly water demands for year 2020 during drought of record conditions assuming 7Q10 minimum flow standards are in place along the White Clay Creek and Brandywine Creek.
- Cross linking with the Division of Public Health regarding certification of water quality in accordance with U.S. Environmental Protection Agency and Delaware primary and secondary drinking water standards.
- Requirements for short-term and long-term master plans for a requested franchise area including capital budget, system mapping and hydraulic computer modeling.
- Cross-linking between DNREC well drilling and allocation permits.
- Cross-linking between certification of minimum pressure and capacity by the Fire Marshall and Division of Public Health.
- Standards for water mains, storage, metering, and interconnections in accordance with American Water Works Association standards and existing State and local regulations.

The water purveyors have expressed support for revamping the CPCN process and moving it to the PSC as the "umbrella" for coordinating water supply regulation in Delaware. The City of Wilmington has pointed out that moving the CPCN process from the DNREC to the PSC may be problematic because the PSC currently oversees only investor-owned water purveyors. The DNREC supports moving the CPCN process to the PSC. Both the DNREC and the PSC have pointed out that more labor and resources (more than the current 0.2 full time equivalent) will need to be allocated to administer the CPCN program if the process is expanded.

Delaware
Drinking Water Regulatory Universe



Advisory: DGS
UD WRA

New Castle County UDC

Jan 1, 2000

STATE OF DELAWARE

EXECUTIVE DEPAR.TMENT

DOVER

EXECUTIVE ORDER
NUMBER SEVENTY-FOUR

TO: HEADS OF ALL STATE DEPARTMENTS, AGENCIES AND AUTHORITIES, AND ALL POLITICAL SUBDIVISIONS AND GOVERNMENTAL UNITS OF THE STATE OF DELAWARE.

RE: IMPLEMENTATION OF THE RECOMMENDATIONS OF THE WATER SUPPLY TASK FORCE; APPOINTMENT OF TEMPORARY WATER COORDINATOR; ESTABLISHMENT OF A WATER SUPPLY COORDINATING COUNCIL.

WHEREAS, on July 23, 1999, by Executive Order Number Sixty-One, I proclaimed a drought warning for the State of Delaware and urged specific voluntary conservation measures;

WHEREAS, on August 5, 1999, by Executive Order Number Sixty-Two, I proclaimed a State of Emergency due to drought and imposed certain mandatory conservation measures;

WHEREAS, on August 26, 1999, by Executive Order Number Sixty-Five, I established a Water Supply Task Force (herein after referred to as "the Task Force") and charged that body with reviewing Delaware's current and projected water supply along with current and projected demand;

WHEREAS, the Task Force was further charged with providing recommendations to the Governor concerning long-term solutions to northern New Castle County's water supply needs, both in terms of normal weather conditions and severe drought condition;

WHEREAS, The Task Force met on September 14, October 1, October 21, November 5, and November 18, 1999, and submitted a final repo1i (herein after referred to as "the Report") to the Office of the Governor on December 2, 1999, containing, among others, the following recommendations:

1. "Appoint an interim or temporary water master, or central coordinator who would obtain input from, facilitate, mediate, and interface with the water providers to ensure that the "A" list of committed to projects and possibly the "B" list projects are implemented according to an agreed upon schedule without slippage."
2. "Appoint a Water Supply Coordinating Council composed of State, Regional, New Castle County officials and the five water providers to work with the water master or coordinator to implement the water supply options."; and

WHEREAS, Given the severity of the drought experienced in northern New Castle County during the summer of 1999, steps must be taken to ensure that the recommendations of the Task Force are implemented as soon as possible so that Delaware is better prepared for future droughts;

NOW THEREFORE, I, Thomas R. Carper, by the authority vested m me as Governor of the State of Delaware, do hereby proclaim as follows:

A. Establishment of Temporary Water Coordinator for Northern New Castle County.

1. The Water Resources Agency (WRA) at the University of Delaware is hereby designated as the "Temporary Water Coordinator" pursuant to the recommendations of the Task Force. The WRA shall oversee the implementation of short-term water supply enhancement projects as documented in the Report.
2. The Delaware Geological Survey (DGS) and the Department of Natural Resources and Environmental Control (DNREC) shall work with the WRA to ensure timely implementation of the projects listed in the Report, and shall assist the WRA in preparing a regular summary on the progress of the water supply projects identified in the Report to the Governor and the General Assembly.
3. Said summary shall be prepared no less than two times per year, with the first such summary being submitted to the Governor and the General Assembly on or before May 31, 2000.
4. The designation of the WRA as Temporary Water Coordinator, and the duties conferred upon it by this Executive Order shall cease as of December 31, 2000.

B. Establishment of a Temporary Water Supply Coordinating Council.

1. A Water Supply Coordinating Council (herein after referred to as "the Council") is hereby established.

   a) The Council shall have the following membership:

      1. The Secretary of DNREC;
      11. The Secretary of the Department of Agriculture
      lll. A representative of the Office of the Governor;
      1v. The Director of the Delaware Public Service Commission;
      v. The Director of the Delaware Emergency Management Office;
      vl. The Director of the Delaware Division of Public Health;
      1. The Delaware Public Advocate
      v11. The Executive Director of the Delaware River Basin Commission;
      v111. A representative of the Government of New Castle County;
      1x. A representative of each public and private water utility serving northern New Castle County;
      1x. A representative of the New Castle County Chamber of Commerce;
      x. A representative of the Delaware State Chamber of Commerce;
      x1. A representative of the Delaware Association of Nurserymen;
      x11. A representative of the Professional Grounds Management Society;
      x111. A representative of the Delaware State Golf Association; and
      xiv. A representative of the Delaware Nature Society.

   b) Members shall serve at the pleasure of the Governor, and the Governor shall select a Chairperson.

   c) Additional members shall be designated by a majority vote of the Council.

2. Consistent with the Report, the Council shall have the following duties and responsibilities:

   a) Work cooperatively with the Temporary Water Coordinator to implement the short-term water supply enhancement projects;

   b) Conduct hydraulic field tests and/or modeling to optimize and expand the intra-county interconnections to convey water from suppliers with excess capacity to suppliers in need of additional water to meet peak demands;

   c) Encourage water providers in northern New Castle County to adopt inclining block and/or conservation water rates as a demand side management measure in a manner that does not hinder economic development in New Castle County;

d) Work with water utilities to develop cooperative cost and capacity agreements to purchase water supplies during drought;

e) Advise the DNREC and provide technical input to the recently authorized U.S. Corps of Engineers Groundwater Availability Study for Northern New Castle County; and

f) Review the policy decision made by DNREC to reserve water supply in Southern New Castle County vis-a-vis the Chesapeake and Delaware Canal Pipeline in light of the recent demand and supply analysis and the changing socioeconomic character of southern New Castle County.

3. The Delaware Department of Natural Resources and Environmental Control, the Delaware Geological Survey and the Water Resources Agency shall provide staff support to the Council.

4. The designation of Water Supply Coordinating Council and the duties and responsibilities conferred upon it by this Executive Order shall cease as of December 31, 2000.

C. The provisions of this Order shall be effective as of January 1, 2000.

APPROVED this 30 day of December 1999.

c31vr- / C - =

Governor

ATTEST:

Secretary of State

Jul 6, 2000

CHAPTER 409

FORMERLY

HOUSE BILL NO. 549

AS AMENDED BY HOUSE AMENDMENT NO. 3

AN ACT TO AMEND CHAPTER 13, TITLE 26 OF THE DELAWARE CODE RELATING TO THE ESTABLISHMENT OF A TEMPORARY WATER COORDINATOR AND A WATER SUPPLY COORDINATING COUNCIL.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE :

WHEREAS, the General Assembly finds that the enhancement of existing water supplies in northern New Castle County is essential to avoid a repeat of the difficulties experienced during the drought of 1999; and

WHEREAS, on August 26, 1999, the Governor's Water Supply Task Force was created and charged with reviewing Delaware's current and projected water supply along with current and projected demand; and

WHEREAS, the Task Force was further charged with providing recommendations to the Governor and the General Assembly concerning short- term and long-term solutions to northern New Castle County's water supply needs; and

WHEREAS, on December 2, 1999, the Governor's Water Supply Task Force submitted its final Report, which recommends various actions and undertakings by utilities and others to move toward ensuring adequate water supply in the future; and

WHEREAS, in its Report, the Task Force identified a series of water supply enhancement projects which, if implemented, will provide a sufficient supply of water for northern New Castle County citizens during any future drought periods; and

WHEREAS, in its Report, the Task Force also recommends the establishment of a temporary Water Coordinator and a Council composed of water providers and others knowledgeable in water supply to monitor the implementation of these enhancement projects; and

WHEREAS, the General Assembly finds that the implementation of the projects recommended in the Report, or similar projects providing a commensurate increase in water supply, is critical to ensuring adequate water supply in northern New Castle County during any future drought periods; and

WHEREAS, the General Assembly finds that utilities should be encouraged to expeditiously implement and complete the identified water enhancement projects;

NOW THEREFORE:

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

Section 1. Amend Chapter 13, Title 26 of the Delaware Code by adding a new § 1305 to read as follows:

“§ 1305. Establishment of a Temporary Water Coordinator for New Castle County.

(a) The Water Resources Agency ("WRA") at the University of Delaware is hereby designated as the "Temporary Water Coordinator for New Castle County" pursuant to the recommendations contained in the final Report of the Governor's Water Supply Task Force submitted on December 2, 1999. The WRA shall monitor the implementation of short-term water supply enhancement projects as documented in that Report.

(b) The Delaware Geological Survey and the Department of Natural Resources and Environmental Control shall work with the WRA to help ensure the timely implementation of the projects identified in the final Report.

(c) The WRA shall prepare, with the assistance of the Delaware Geological Survey and the Department of Natural Resources and Environmental Control, periodic reports for the Governor and the General Assembly summarizing the progress towards completion of the projects identified in the final Report. The WRA shall submit the first such report on, or before, May 31, 2000, and shall thereafter submit additional reports no less than twice each year.”

Section 2. Amend Chapter 13, Title 26 of the Delaware Code by adding a new § 1306 to read as follows:

“§ 1306. Establishment of a Temporary Water Supply Coordinating Council.

(a) A Water Supply Coordinating Council is hereby established.

(1) The Council shall have the following members:

a. the Secretary of the Department of Natural Resources and Environmental Control;

b. the Secretary of the Department of Agriculture;

c. the Executive Director of the Public Service Commission;

d. the Director of the Delaware Emergency Management Agency;

e. the Director of the Division of Public Health;

f. the Public Advocate;

g. the Executive Director of the Delaware River Basin Commission;

h. a representative of the Office of the Governor;

i. a representative of the Government of New Castle County;

j. a representative of each public and private water utility serving New Castle County;

k. a representative of the New Castle County Chamber of Commerce;

1. a representative of the Delaware State Chamber of Commerce;

m.a representative of the Delaware Nursery and

Landscape Association;

n. a representative of the Professional Grounds

Management Society;

o. a representative of the Delaware State Golf

Association; and,

p. a representative of the Delaware Nature Society.

(2) The Governor shall appoint the representatives described in subparagraphs h. through p. of paragraph (1) of this subsection. The Council, by majority vote, may designate additional members of the Council.

(3) The Governor shall select a Chairperson from the members of the Council to serve at the pleasure of the Governor.

(b) the principal duty of the Council shall be to work cooperatively with the Temporary Water Coordinator for New Castle County (established pursuant to § 1305 of this Title) to implement short-term water supply enhancement projects. Additional duties of the Council shall consist of performing the following specific functions:

1. To provide technical input in conducting hydraulic field tests and/or modeling to optimize and expand the intra-county interconnections to convey water from suppliers with excess capacity to suppliers in need of additional water to meet peak demands;

2. To work with water utilities to develop cooperative market based cost and capacity agreements for the purchase of water supplies during drought and other times emphasizing the need for providers with supply deficiencies to enter agreements which assure adequate supply to customers;

3. To provide technical input to the recently authorized U. S. Army Corps of Engineers Groundwater Availability Study for northern New Castle County; and

4. To examine appropriate utilization of all water supply sources located in both northern and southern New Castle County."

(c) The Department of Natural Resources and Environmental Control, the Delaware Geological Survey, and the Water Resources Agency of the University of Delaware shall provide staff support for the Council."

Section 3. Amend Chapter 13, Title 26 of the Delaware Code by adding a new § 1307 to read as follows:

"§ 1307. Recovery of costs of water supply enhancement projects in rates of public utilities.

In the case of a public utility subject to the jurisdiction of the Public Service Commission, upon the determination by the Commission that a water supply enhancement project identified in the final report of the Governor's Water Supply Task Force has been placed into service by the utility and is used and useful in the provision of public utility service, the public utility shall be entitled to recover, in its rates, its reasonable and prudently incurred capital and on-going operating costs for such project. Nothing in this section shall preclude the Commission from authorizing an allowance for funds used during construction for any such identified enhancement project."

Section 4. Amend Chapter 13, Title 26 of the Delaware Code by adding a new Section 1308 to read as follows:

"§ 1308. Length of Service for Temporary Water Coordinator and Water Supply Coordinating Council.

The designation of the WRA as the Temporary Water Coordinator for New Castle County, the designation of the Water Supply Coordinating Council and the duties and responsibilities conferred upon each by this section shall be subject to annual reauthorization by the General Assembly beginning no later than June 30, 2001. Such reauthorization shall be for a period not to exceed one year, and shall be based on the Water Supply Coordinating Council demonstrating that water provider(s) have acted in good faith to make the investments, system improvements or agreements necessary to assure adequate quality water supply, during drought and at other times for their customers."

Section 5. This act shall become effective upon its enactment.

Approved July 06, 2000

OUR VIEW

Mar 22, 2002

Publication info: The News Journal ; Wilmington, Del. [Wilmington, Del]. 22 Mar 2002: A.14.

ABSTRACT

Real relief will not come until the government officials responsible for monitoring and regulating drinking water supplies authorize one or more additional reservoirs to reduce northern Delaware's dependence on surface water.

FULL TEXT

RESERVOIRS

Despite rain, Delaware is still in deep trouble

If it rains today, don't heave a sigh of relief. We need the precipitation, but drought relief is not in sight and won't be even if it rains for two weeks. Real relief will not come until the government officials responsible for monitoring and regulating drinking water supplies authorize one or more additional reservoirs to reduce northern Delaware's dependence on surface water.

This winter drought has been extraordinary in its length. But even dry spells in regular natural cycles send Delaware water watchers into a frenzy of worry over when and where to apply restrictions. Officials upstream of our sources are mandated to let certain amounts flow through to Delaware, but each year they say Delaware must get its act together and find better emergency supplies for itself.

Rather than relax after the rain, Gov. Minner and her drought advisory committee need to forge forward to find options to relieve our emergency exposure. Building reservoirs should be among those options.

Gerald J. Kauffman, the state water coordinator, argued persuasively in a Sunday News Journal article this week that hydropolitics must be set aside and everyone must concentrate on solving the problem. That means disagreements among water utilities, neighboring states and municipalities must take a back seat.

It takes a long time to build a reservoir. Every week and month that passes with thumb-twiddling and rain dancing puts us further away from a sound water storage solution for northern Delaware. Weather; Drought DE Northeast NEWS; Pg. 14A

DETAILS

Subject:	Rain; Drought; Surface water
Publication title:	The News Journal; Wilmington, Del.
Pages:	A.14
Publication year:	2002
Publication date:	Mar 22, 2002
Section:	NEWS

OUR VIEW

Publication info: The News Journal ; Wilmington, Del. [Wilmington, Del]. 14 Sep 2002: A.6.

Sep 14, 2002

ABSTRACT

[...] the council can only present research, sound the alarm and set a new deadline for meeting goals for drought remediation.

FULL TEXT

SUPPLY AND DEMAND

Severe drought shows the need for a central, empowered authority

When members of Delaware's Water Supply Coordinating Council gather to mull over remedies for northern New Castle County's chronic problems during droughts, they immediately run into two obstacles. One is that there is no apparent "silver bullet" solution available in the foreseeable future, like a new half-billion gallon reservoir. The other is the lack of political will to tackle the regulatory complexities involved in creating a single government controlled water agency with the power to balance water supplies among competing private and public water utilities during droughts.

That leaves the council promoting a piecemeal approach that is not only difficult to implement but also difficult to control because the council's power is limited. At its most recent meeting, the council, faced with the most severe drought conditions since 1911, could do little more than admonish and cajole. Detailed proposals for drought relief have existed since 1999, but the best the council can do is jawbone the various independent players to speed up the pace of what they have already promised to do.

In the end, the council can only present research, sound the alarm and set a new deadline for meeting goals for drought remediation. If those goals are not met, it can only brandish the threat of action by the Public Service Commission, an agency that the council and all the other players know is not set up to deal with this kind of situation.

Northern New Castle County's drought solutions will be parceled out to the individual utilities. Artesian Water Co. will press on with its aquifer replenishment project, United Water will be urged to build its own reservoir on Bread and Cheese Island on the Christina River. Wilmington will be encouraged to expand the capacity of Hoopes Reservoir. Then various schemes for running pipelines from Chester, Philadelphia and from southern New Castle County will be considered, along with ideas about desalinating Delaware and Christina River water by Wilmington and United during droughts. Every one of these solutions has been on the books for at least three years.

But now a new complexity has arisen. Wilmington and United draw so much water from the Brandywine and White Clay creeks that concerns are rising about downstream ecological damage. Except when it gets special permission, United is restricted. Wilmington is not.

If, as is now being proposed, Wilmington's intake from the Brandywine during droughts is also restricted it will make the city's water system far more dependent on Hoopes Reservoir, which until now has been the region's most dependable drought insurance. Even if Hoopes is expanded, with restrictions, Wilmington itself would need most of the reservoir water in a severe drought like this one. That would severely reduce Wilmington's ability to help other utilities during droughts.

It is becoming clearer than ever that the missing ingredient is an empowered water overseer. If a water district is not feasible, then the state's water supply chief, Gerald Kauffman of the University of Delaware, should be given far greater power to manage water supplies and drought remedies both in and out of drought conditions. There are too many conflicting interests to do it effectively any other way. Weather; Drought DE Northeast

NEWS; Pg. 6A

DETAILS

Subject:	Water supply; Drought; Water utilities; Water shortages
Publication title:	The News Journal; Wilmington, Del.
Pages:	A.6
Publication year:	2002
Publication date:	Sep 14, 2002

$15 million plan may resolve water woes

Dec 27, 2002

Osullivan, Sean . The News Journal ; Wilmington, Del. [Wilmington, Del]. 27 Dec 2002: A.1.

ABSTRACT

State panel to outline steps to increase NCCo's reserves By SEAN O'SULLIVAN, Staff reporter The Delaware Water Supply Coordinating Council will recommend later this month an estimated $15 million in improvements that it said will solve New Castle County's drinking-water problems for the next 20 years. The proposals include expanding the capacity of Hoopes Reservoir with an inflatable barrier on the spillway; upgrading Brandywine River pumping stations so Wilmington can capture water and store it in the reservoir more quickly; and pumping water during wet periods into underground aquifers for use during droughts.

FULL TEXT

State panel to outline steps to increase NCCo's reserves

By SEAN O'SULLIVAN, Staff reporter

The Delaware Water Supply Coordinating Council will recommend later this month an estimated $15 million in improvements that it said will solve New Castle County's drinking-water problems for the next 20 years.

The proposals include expanding the capacity of Hoopes Reservoir with an inflatable barrier on the spillway; upgrading Brandywine River pumping stations so Wilmington can capture water and store it in the reservoir more quickly; and pumping water during wet periods into underground aquifers for use during droughts.

If there is quick agreement on the recommendations, the improvements could be completed by 2004, according to Water Supply Coordinator Gerald Kauffman. The new capacity would more than surpass the council's goal of adding more than 450 million gallons of water storage in New Castle County, according to water officials.

Expanding water reserves is important because in a worst-case, 75-day drought, public water supplies could fall short by 6 million gallons a day by 2020, officials said in October. Six million gallons represents 6.8 percent of normal use in northern Delaware.

Lt. Gov. John Carney, who is a member of the council, said the three proposals would enable the state to go through another record drought without mandatory water restrictions, such as those Gov. Ruth Ann Minner imposed last summer for areas north of the Chesapeake &Delaware Canal.

"I think this should give citizens of northern New Castle County a much greater level of comfort," he said.

The work would be paid for by public and private water suppliers and would not involve any state money, he said.

The projects also are comparatively inexpensive, so Carney and utility officials said they should not require large rate increases for consumers. The 318-million-gallon Newark reservoir - now being built - will cost about $16 million.

The report by the advisory council is to be delivered to Minner and the General Assembly by Dec. 31, according to Kauffman. The council was set up in 2000 after the 1999 drought to plan for water needs. Its members include representatives of government agencies, water providers, water users and environmental organizations.

Finance questions linger

Utility executives and Wilmington officials said they support the concepts for expanding the area's storage capacity but want to see further engineering studies and details on how to pay for the work.

Anthony Langley, general manager of United Water Delaware, said his company expects to participate in expanding

the capacity of Hoopes Reservoir, which is owned by Wilmington, and using aquifers for storage and recovery. But he said he was uncertain whether the utility would participate in the upgrade of pumping stations feeding Hoopes.
"I'm not sure I can clearly see what is in it for us," he said. "It doesn't increase overall storage capacity."
United Water would be asked to help pay to expand Hoopes because it relies on being able to buy water reserves from the city during droughts. United Water bought more than 6 million gallons a day of Hoopes water from Wilmington during the peak of last summer's drought.
Joseph DiNunzio, senior vice president with Artesian Water Co., said he thinks the proposals are appropriate and capable of preventing water emergencies.
But Wilmington Public Works Commissioner Kash Srinivasan said he would like to see more engineering and financing information, particularly about the contemplated expansion of the city's reservoir.
"Anything you do to a dam is a major engineering issue, because you have to show the dam can hold back additional water," he said. "It is not a trivial matter. You should proceed extremely carefully."
Kauffman said the council would recommend that an inflatable gate 3 to 5 feet tall be installed for use when a drought is predicted, to increase the capacity of the 1.8-billion-gallon reservoir by 225 million gallons. He said he did not think any additional work would be needed on the dam itself.
Expanding the capacity of Hoopes would cost $3 million to $5 million, Kauffman said. Wilmington and water companies that buy water from the city during dry periods, mainly United Water, would pay the costs.
Srinivasan said the city needs more details on how the project would be paid for.
"Our posture is: We want to be helpful, but we don't have money to spare," he said. "We have to figure out the financial issues. We won't be standing in the way if that can be worked out."
In November, the City Council approved $7.6 million in engineering fees to hire five consultants to study a variety of issues related to improvements to and operation of the water system.
Among the projects to be studied are improvements to the Cool Spring Reservoir, expansion of Hoopes Reservoir and the replacement of aging parts, such as pumps, Srinivasan said. Consultants also will study proposed upgrades to one of the city's two filtration plants, and a proposal to include a desalination plant as part of the upgrade.
˙B-list' projects set aside
The state water council also will recommend expanding the capacity of the city pumping stations that draw water from the Brandywine River for storage in the reservoir. The stations now can capture about 20 million to 24 million gallons a day and the council wants to increase that to about 40 million a day. That would allow water from a rainfall in the middle of a drought to be captured more efficiently, Kauffman said.
The council's last proposal is for United Water and Artesian to use the aquifers they currently tap for drinking water as underground reservoirs. Water would be pumped into the aquifers for storage and drawn out during droughts, Kauffman said.
Officials with both utilities said they support the idea, which could add 350 million gallons of storage capacity. Artesian successfully stored and recovered about 125 million gallons using this process in 2002, DiNunzio said.
The drawback of underground storage is that up to 30 percent of the stored water can be lost over time. But Kauffman said it is more cost-effective than building a new reservoir.
Kauffman said the council also designated several "B-list" projects that are not being recommended, largely because of cost. That list includes construction of a new reservoir by United Water and creating a desalination plant in Wilmington. Both could be pursued in the future.
The Newark reservoir, set to open this spring, also will help greatly in a drought. Had that reservoir been operating this summer, there may not have been a drought emergency, Kauffman said. The Newark reservoir's 300 million-gallon capacity was almost the same amount of water that had to be taken from Hoopes Reservoir during the 2002 drought.
The drought in northern Delaware and neighboring states has abated with normal rainfall in November and December. The state's drought emergency was lifted in October and similar water use restrictions in Maryland,

New Jersey and Pennsylvania also have been withdrawn.
Kauffman said stream flows appear to have rebounded from more than a year of below-normal rain and conditions suggest the state will avoid drought conditions in 2003.
"I think we are in good shape," he said.
Reach Sean O'Sullivan at 324-2777 or at sosullivan@delawareonline.com.

DETAILS

Subject:	Water utilities; Water supply; Water shortages; Public works; Drought; Councils
Publication title:	The News Journal; Wilmington, Del.
Pages:	A.1
Publication year:	2002
Publication date:	Dec 27, 2002

CHAPTER 179

AN ACT TO AMEND TITLE 26 OF THE DELAWARE CODE RELATING TO THE WATER SUPPLY SELF-SUFFICIENCY ACT OF 2003. BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE :

Section 1. This Act shall be known as the “Water Supply Self-Sufficiency Act of 2003.” Section 2. Amend Title 26 of the Delaware Code by adding thereto a new chapter to read:

Jul 8, 2003

"CHAPTER 14. SELF-SUFFICIENT WATER SUPPLY

§1401. State policy.

It is the declared policy of this State:

(1) that water utilities, both public and private, should have adequate supplies of water available, even in times of drought, to meet the present and future needs of this State on a continuing and sustainable basis;

(2) that by the year 2010, all water utilities, both public and private, which serve northern New Castle County should have sources of supply and interconnection commitments within this State to provide an adequate supply of water for northern New Castle County during periods of drought;

(3) that, in order to ensure adequate water supply in northern New Castle County, water utilities in that area should implement rate and pricing structures which encourage the efficient use of water by informed residential customers; and

(4) that, in order to ensure that water utilities recognize the need to obtain a water supply adequate to serve customers in northern New Castle County, water utilities serving that area should periodically publicly certify that they have an adequate supply of water to meet future anticipated demand.

§1402. Definitions.

For purposes of this chapter, unless the context otherwise directs:

(1) 'Adequate supply' means a volume of water supply from all sources which meets or exceeds the projected demand. The amount of adequate supply is calculated on the premise that, in the projected year, drought of record conditions exist.

(2)'Commission' means the Public Service Commission as established by the provisions of Chapter 1 of this title.

(3) 'Drought of record' means a period of 75 days of climatological, streamflow, and groundwater conditions similar to those that prevailed in northern New Castle County during the drought emergency of 2002, or as redefined by the Water Supply Coordinating Council if a more severe drought occurs in the future.

(4)'Drought sensitive area' means the portion of the State located north of the Chesapeake and Delaware Canal.

(5) 'Jurisdictional water utility' means a water utility which is subject to the regulatory jurisdiction of the Public Service Commission under the provisions of §201 of this title.

(6) 'Non-jurisdictional water utility' means a water utility which is not subject to, or is excluded from, the jurisdiction of the Public Service Commission under the provisions of §202 of this title.

(7) 'Projected demand' means the anticipated demand for water supply in the drought sensitive area during a drought of record in the projected year as determined for each water utility by the Water Supply Coordinating Council. 'Projected demand' may be expressed in terms of gallons per year, average daily demand on an annual basis, maximum daily demand, maximum monthly demand, or any other comparable reporting measure as determined by the Water Supply Coordinating Council.

(8)'Projected year' means the third calendar year following a reporting year.

(9)'Reporting year' means the year 2006 and every third year thereafter.

(10) 'Water Supply Coordinating Council' or 'Council' means the entity established by §1306 of this title. If the Water Supply Coordinating Council lapses or expires, a reference to the Water Supply Coordinating Council is deemed to refer to the Department of Natural Resources and Environmental Control acting in consultation with the University of Delaware Water Resources Agency (WRA), the Delaware Geological Survey, and water utilities.

(11) 'Water utility' means any person or entity, including a municipality, water district, cooperative, or investor-owned company or corporation, that operates within the drought sensitive area a water service, system, plant, or equipment for public use. The term 'water utility' does not include a municipal entity or municipal water utility in the drought sensitive area which provides public water utility services to 5,000 or less customers.

§1403. Projected demand determination for each water utility.

(a) On or before March 1 of each reporting year, the Water Supply Coordinating Council shall determine, publish, and transmit to the Commission for the following projected year the projected demand for each water utility providing water utility services in the drought sensitive area.

§1404. Reporting requirements for jurisdictional water utilities: consumer water c**Jul 6, 2000**

onservation plans and certifications of adequate supply.

(a) On or before July 1 of a reporting year, each jurisdictional water utility in the drought sensitive area shall file with the Commission:

(1) a consumer water conservation plan (Plan) for the following 3-year period; and

(2) a certification of adequate water supply (Certification) for the projected year.

The Plan and the Certification must be applicable to water utility services provided by the jurisdictional water utility in the drought sensitive area.

(b) Consumer water conservation plan. Each Plan filed by a jurisdictional water utility must include:

(1) a description of the jurisdictional water utility's proposed methods of consumer education to:

a. make consumers aware of the benefits arising from the efficient use of water supply;

b. make consumers aware of, and understand, any water conservation rate that is in effect, or that will be implemented by the jurisdictional water utility during the following 3 years;

c. make consumers aware of the existence of both new and retrofitted consumer equipment that improves the efficient use of water; and

d. make consumers aware of the costs arising from the loss of water through leakage in consumer water systems; and

(2) for each reporting year after 2006, an evaluation of the effectiveness of the jurisdictional water utility's preceding consumer water conservation plan in informing consumers of methods to improve the efficient use of the water supply.

(c) The Commission shall review each jurisdictional water utility's consumer water conservation plan, and, within 120 days after the filing of the Plan, shall acknowledge the Plan. In its acknowledgment, the Commission may suggest modifications to the Plan. A jurisdictional water utility may accept or reject the suggested modifications. The jurisdictional water utility shall implement its Plan during the following 3-year period.

(d) Certification of adequate supply. With its consumer water conservation plan, each jurisdictional water utility shall file with the Commission a certification that the jurisdictional water utility has sufficient sources of water to provide adequate supply to meet the projected demand in the drought sensitive area for the following projected year. The certification must be executed by the chief executive officer of the jurisdictional water utility. With the certification, the jurisdictional water utility shall provide supporting materials and documents that update information previously provided to the Commission identifying each source of supply and the volume of water available from each source. The supporting materials and documents must demonstrate that, for the projected year, the volume of supply from the jurisdictional water utility's sources will be adequate to meet or exceed the projected demand.

(e) Beginning with the reporting year 2009, in addition to certifying adequate supply pursuant to subsection (d) of this section, each jurisdictional water utility shall also certify that none of its sources of supply for use during a drought of record are reliant on contracts with out-of-state water authorities or utilities, except for minimum purchase obligations under purchase-water contracts in existence on April 1, 2003 between Delaware water utilities and non-Delaware providers.

(f) The Commission shall review and investigate the jurisdictional water utility's certification of adequate supply and the supporting materials and documents. In conducting a review and investigation, the Commission may direct the jurisdictional water utility to provide additional supporting materials and documents. The Commission may also consult with other entities, including the Department of Natural Resources and Environmental Control and the Water Supply Coordinating Council.

(g) If the Commission finds that the jurisdictional water utility's supporting materials and documents and the Commission's review and investigation justify the jurisdictional water utility's certification, the Commission shall accept the certification.

(h) If the Commission finds that the jurisdictional water utility's supporting materials and documents do not support the water utility's certification, or if the Commission finds, based upon its review and investigation, that the jurisdictional water utility will not have adequate supply to meet its projected demand during the following projected year, the Commission shall reject the water utility's certification. The jurisdictional water utility may then file an amended certification with supporting materials and documents to demonstrate what additional sources and supply will be available to meet projected demand during the following 3-year period. The Commission shall review the amended certification in the same manner as it reviewed the water utility's original certification of adequate supply.

(i) If the Commission rejects a certification under subsection (h) of this section, the Commission, until it determines that the jurisdictional water utility has adequate supply to meet projected demand, may:

(1) refrain from granting any certificates of public convenience and necessity to the jurisdictional water utility; and

(2) direct the jurisdictional water utility to develop new sources of water supply by a set deadline and may take any actions available under §203C(f) and §403(b) and (c) of this title.

§1405. Reporting requirements for non-jurisdictional water utilities: consumer water conservation plans and certifications of adequate supply.

(a) On or before July 1 of each reporting year, each non-jurisdictional water utility in the drought sensitive area shall submit to the Water Supply Coordinating Council:

(1) a consumer water conservation plan (Plan) for the following 3-year period; and

(2) a certification of adequate water supply (Certification) for the projected year.

The Plan and the Certification must be applicable to water utility services provided by the non-jurisdictional water utility in the drought sensitive area.

(b) Consumer water conservation plan. Each Plan submitted by a non-jurisdictional water utility must fulfill the criteria set forth in §1404(b) of this chapter. The non-jurisdictional water utility shall implement its Plan during the following 3-year period.

(c) Certification of adequate supply. With its consumer water conservation plan, each non-jurisdictional water utility shall submit to the Water Supply Coordinating Council a certification that the non-jurisdictional water utility has sufficient sources of water supply to provide adequate supply to meet the projected demand in the drought sensitive area for the following projected year. The certification must be executed by the governmental officer responsible for the operation of the non-jurisdictional water utility. With the certification, the non-jurisdictional water utility shall provide supporting materials and documents that identify each source of supply and the volume of water available from each source. The supporting materials and documents must demonstrate that, for the projected year, the volume of supply from the non-jurisdictional water utility's sources will be adequate to meet or exceed the projected demand.

(d) Beginning with the reporting year 2009, in addition to certifying adequate supply pursuant to subsection (c) of this section, each non- jurisdictional water utility shall also certify that none of its sources of supply for use during a drought of record are reliant on contracts with out-of-state water authorities or utilities, except for minimum purchase obligations under purchase-water contracts in existence on April 1, 2003 between Delaware water utilities and non-Delaware providers.

(e) The Water Supply Coordinating Council shall review the non-jurisdictional water utility's certification of adequate supply and the supporting materials and documents. If the Council believes that the supporting materials and documents do not support the certification, the Council shall notify the non-jurisdictional water utility of the deficiency. The non-jurisdictional water utility may then submit additional materials and documents to support its certification.

§1406. Water conservation rates.

(a) Prior to January 1, 2005, each water utility shall implement a water conservation rate structure for water utility services provided to its customers in the drought sensitive area.

(b) The water conservation rate structure must apply, at a minimum, to all residential customers subscribing to water services in the drought sensitive area and shall, initially, reflect either:

(1) an inclining block rate structure, under which the unit price for water supply increases as consumption, as measured by successive blocks, increases; or

(2) a seasonal rate structure, imposing an increased unit price for water supply consumed during specified months of the year.

(c) Jurisdictional Water Utilities. On or before April 1, 2004, each jurisdictional water utility shall file with the Commission its proposed water conservation rate structure. The jurisdictional water utility shall include with its rate structure proposal a schedule for the implementation of its water conservation rate structure and a specific plan for informing and educating affected customers about the adoption of the water conservation rate structure. If, on the date of the enactment of this chapter, a jurisdictional water utility already has a water conservation rate structure, the jurisdictional water utility shall, on or before April 1, 2004, file a description of its rate structure, and any proposed amendments to the rate structure.

(d) The Commission, within 180 days after the filing of a water conservation rate proposal by a jurisdictional water utility, shall approve, with or without modifications, the jurisdictional water utility's water conservation rate structure.

(e) On or before July 1, 2009, each jurisdictional water utility shall file with the Commission an evaluation and analysis of the impact of its water conservation rate structure on its customers' demands for water supply in the drought sensitive area during the period 2005 through 2008. If the jurisdictional water utility had a water conservation rate structure in effect prior to 2005, the utility may file the evaluation and analysis for a period beginning with the implementation date of its water conservation rate structure. After reviewing the evaluation and analysis, the Commission, on its own motion or on application of the jurisdictional water utility, may modify the jurisdictional water utility's water conservation rate structure. Modifications may include water conservation rate methods beyond those identified in subsection (b) of this section. The jurisdictional water utility shall provide a similar evaluation and analysis to the Commission every five years thereafter; and, after reviewing the similar evaluation and analysis, the Commission may again modify the water utility's water conservation rate structure.

(f) For good cause or in cases of hardship, the Commission may, at any time, approve modifications or changes to any water conservation rate structure proposed or implemented by any jurisdictional water utility.

(g) Non-jurisdictional water utilities. On or before April 1, 2004, each non-jurisdictional water utility shall submit its proposed water conservation rate structure to the Water Supply Coordinating Council. The non-jurisdictional water utility shall include with its proposal a schedule for implementation of its water conservation rate structure and a specific plan for informing and educating its affected customers about the adoption of a water conservation rate structure.

(h) On or before April 1, 2009, each non-jurisdictional water utility shall submit to the Water Supply Coordinating Council an evaluation and analysis of the impact of its water conservation rate structure on its customers' demands for water supply in the drought sensitive area during the period from the date of the non-jurisdictional water utility's implementation of its rate structure through 2008. With the evaluation and analysis, the non- jurisdictional utility shall submit any proposal to modify or change its water conservation rate structure and the date for implementing its modifications or changes. The modifications or changes may include water conservation rate methods beyond those identified in subsection (b) of this section. Each non- jurisdictional water utility shall submit a similar evaluation and analysis every five years thereafter, accompanied by further proposed modifications or changes.

(i) For good cause or in cases of hardship, a non-jurisdictional utility may modify or change its water conservation rate structure at any time. A non-jurisdictional water utility shall notify the Water Supply Coordinating Council in writing of any modifications or changes in the utility's water conservation rate structure at least 60 days prior to the implementation of the modifications or changes.

§1407. Interconnections and wholesale bulk sales.

(a) In order to ensure adequate supply to all consumers within the drought sensitive area during periods of anticipated or actual drought, the Commission has the jurisdiction and authority to order and direct a jurisdictional water utility to interconnect its facilities with those of other water utilities and to offer for sale to other utilities water supply at wholesale bulk rates previously approved by the Commission. The wholesale bulk rates must be

based on the costs of service principles for the provision of the water supply. In making determinations concerning interconnection and wholesale sales, the Commission shall ensure that an interconnection or sale does not jeopardize the ability of the jurisdictional water utility to provide adequate supply to its own customers. For good cause, the Commission may order an interconnection on an expedited basis.

(b) In order to ensure adequate supply to all consumers within the drought sensitive area during periods of anticipated or actual drought, each non-jurisdictional utility shall, when reasonably necessary, interconnect its facilities with those of other water utilities and offer to sale to other water utilities water supply at just and reasonable wholesale bulk rates. The wholesale bulk rates must be based on the costs of providing the water supply. In interconnecting and offering for sale water supply, a non-jurisdictional water utility shall ensure that an interconnection or sale does not jeopardize the ability of the non-jurisdictional water utility to provide adequate supply to its own customers.

(c) The provisions of subsections (a) and (b) of this section do not preclude a water utility from otherwise contracting to provide water supply to other water utilities at just and reasonable wholesale bulk rates. However, in the case of a jurisdictional water utility, the wholesale bulk rates must be approved by the Commission.

§1408. Implementing regulations.

The Commission may adopt regulations to implement the provisions of this chapter as it applies to jurisdictional water utilities.".

Approved July 8, 2003

CHAPTER 184

FORMERLY

HOUSE BILL NO.

203

AS AMENDED BY

HOUSE AMENDMENT

NO. 2

Aug 4, 2003

AN ACT TO AMEND TITLE 26, CHAPTER 13 OF THE DELAWARE CODE RELATING TO PUBLIC UTILITIES; GAS, WATER AND OIL CORPORATIONS.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE :

Section 1. Amend Chapter 13, Title 26 of the Delaware Code by striking §1305 through §1308 in its entirety, and substituting in lieu thereof the following:

"§1305 Establishment of a State Water Supply Coordinating Council.

(a) A Water Supply Coordinating Council is hereby established.

(1) The Council shall have the following members:

a. The Secretary of the Department of Natural Resources and Environmental Control or his/her designee;

b. The Secretary of the Department of Agriculture or his/her designee;

c. The Executive Director of the Public Service Commission or his/her designee;

d. The Director of the Delaware Emergency Management Agency or his/her designee;

e. The Director of the Division of Public Health or his/her designee;

f. The Public Advocate or his/her designee;

g. The Director of the Delaware Geological Survey or his/her designee;

h. The Director of the Water Resources Agency at the University of Delaware or his/her designee;

i. The Executive Director of the Delaware River Basin Commission or his/her designee;

j. A representative of the Office of the Governor;

k. A representative of the Governments of New Castle County, Kent County, and Sussex County;

l. A representative of each public and private water utility serving New Castle County;

m. A representative of public water supply utilities from the membership of Sussex County Association of Towns (SCAT);

n. A representative of public water supply utilities of Kent County from the membership of the League of Local Governments;

o. A representative from the Delaware Rural Water Association;

p. A representative from the membership of the Delaware Chapter of the National Association of Water Companies not included in “l” above;

q. One representative from each county representing local Chambers of Commerce in New Castle County, Kent County, and Sussex County;

r. A representative of the Delaware State Chamber of Commerce;

s. A representative of the New Castle County Chamber of Commerce;

t. A representative of the Delaware Nursery and Landscape Association;

u. A representative of the Delaware Grounds Management Association;

v. A representative of the Delaware State Golf Association;

w. A representative of the Delaware Nature Society;

x. A representative from the Delaware Farm Bureau;

y. A representative from the Center for Inland Bays;

z. The State Fire Marshal or his/her designee.

aa. A representative from the Civic League of New Castle County; and

bb. A representative from the Coalition of Natural Stream Valleys.

(b) The Secretary of the Department of Natural Resources and Environmental Control or his/her designee shall serve as Chair of the Council.

(c) The Council, by majority vote, may establish subcommittees to address water supply issues and plans that do not require the full participation of the Council. The subcommittees shall report to the Council and any recommended actions shall require the approval of the Council.

§1306. Reports by the Water Supply Coordinating Council.

(a) The Water Resources Agency ("WRA"), the Delaware Geological Survey ("DGS"), the Department of Natural Resources and Environmental Control ("DNREC"), and the Division of Public Health (DPH) shall assist the Water Supply Coordinating Council ("WSCC") to help ensure the timely implementation of the projects identified in the WSCC report dated January 17, 2003.

(b) The WRA, DGS, DNREC, and DPH shall prepare periodic reports on behalf of the Water Supply Coordinating Council (WSCC) for the Governor and the General Assembly summarizing the progress towards completion of the projects identified in the report. The first report shall be submitted on or before December 31, 2003 with additional reports submitted no less than twice each year.

(c) The principal duty of the Council shall be to work cooperatively with WRA, DGS, DNREC, and DPH to achieve water supply self sufficiency in northern New Castle County by 2010, and to develop and publish water supply plans for southern New Castle County, Kent County, and Sussex County. These plans shall identify and describe uses, localities, or areas where water supply issues exist, and identify and describe localities, or areas where future water supply issues may occur. These areas and uses should include, but not be limited to Middletown-Odessa-Townsend, Dover and central Kent County, Coastal Sussex County and agricultural irrigation uses. These plans shall contain an estimate of existing and future public and private water supplies and water demands through 2025. Private demands shall take into account, to the maximum extent practicable, all domestic, industrial, and irrigation uses. Additional duties of the Council shall consist of performing the following specific functions:

(1) To provide technical input in conducting hydraulic field tests and/or modeling to optimize and expand, where appropriate, water utility connections;

(2) To work with water utilities to develop cost and capacity agreements subject to approval by the applicable rate-setting authority for the purchase of water supplies during drought and other times emphasizing the need for providers with supply deficiencies to enter agreements which assure adequate supply to customers; and

(3) To conclude the authorized U. S. Army Corps of Engineers Groundwater Availability Study for northern New Castle County and provide technical support on any groundwater availability studies as deemed necessary by the WSCC.

§1307. Recovery of costs of water supply enhancement projects in rates of public utilities.

In the case of a public utility subject to the jurisdiction of the Public Service Commission, upon the determination by the Commission that a water supply enhancement project identified as necessary to assure adequate supply in a report of the Water Supply Coordinating Council has been placed into service by the utility and is used and useful in the provision of public utility service, the public utility shall be entitled to recover, in its rates, its reasonable and prudently incurred capital and ongoing operating costs for such project. Nothing in this section shall preclude the Commission from authorizing an allowance for funds used during construction for any such identified enhancement project. *(72 Del. Laws, c. 409, § 3.)*

§ 1308. Length of service for the Water Supply Coordinating Council.

The designation of the Water Supply Coordinating Council, and the duties and responsibilities conferred by this section shall end on January 1, 2010.

Approved August 4, 2003

§ 1305 Establishment of a State Water Supply Coordinating Council.

(a) A Water Supply Coordinating Council is hereby established.

(1) The Council shall have the following members:

a. The Secretary of the Department of Natural Resources and Environmental Control or the Secretary's designee;
b. The Secretary of the Department of Agriculture or the Secretary's designee;
c. The Executive Director of the Public Service Commission or the Executive Director's designee;
d. The Director of the Delaware Emergency Management Agency or the Director's designee;
e. The Director of the Division of Public Health or the Director's designee;
f. The Public Advocate or the Public Advocate's designee;
g. The Director of the Delaware Geological Survey or the Director's designee;
h. The Director of the Water Resources Agency at the University of Delaware or the Director's designee;
i. The Executive Director of the Delaware River Basin Commission or the Executive Director's designee;
j. A representative of the office of the Governor;
k. A representative of the Governments of New Castle County, Kent County and Sussex County;
l. A representative of each public and private water utility serving New Castle County;
m. A representative of public water supply utilities from the membership of Sussex County Association of Towns (SCAT);
n. A representative of public water supply utilities of Kent County from the membership of the League of Local Governments;
o. A representative from the Delaware Rural Water Association;
p.A representative from the membership of the Delaware Chapter of the National Association of Water Companies not included in "l" above;
q. One representative from each county representing local Chambers of Commerce in New Castle County, Kent County and Sussex County;
r. A representative of the Delaware State Chamber of Commerce;
s. A representative of the New Castle County Chamber of Commerce;
t. A representative of the Delaware Nursery and Landscape Association;
u. A representative of the Delaware Grounds Management Association;
v. A representative of the Delaware State Golf Association;
w. A representative of the Delaware Nature Society;
x. A representative from the Delaware Farm Bureau;
y. A representative from the Center for Inland Bays;
z.The State Fire Marshal or the State Fire Marshal's designee; aa. A representative from the Civic League of New Castle County;
bb. A representative from the Coalition of Natural Stream Valleys; and
cc. The State Climatologist or State Climatologist's designee.

(b)The Secretary of the Department of Natural Resources and Environmental Control or the Secretary's designee shall serve as Chair of the Council.

(c) The Council, by majority vote, may establish subcommittees to address water supply issues and plans that do not require the full participation of the Council. The subcommittees shall report to the Council and any recommended actions shall require the approval of the Council.

72 Del. Laws, c. 409, § 1; 74 Del. Laws, c. 184, § 1; 77 Del. Laws, c. 107, § 1.;

§ 1306 Reports by the Water Supply Coordinating Council.

(a)The Water Resources Agency ("WRA"), the Delaware Geological Survey ("DGS"), the Department of Natural Resources and Environmental Control ("DNREC"), and the Division of Public Health (DPH) shall assist the Water Supply Coordinating Council ("WSCC") to help ensure the timely implementation of the projects identified in the WSCC report dated January 17, 2003.

(b) The WRA, DGS, DNREC, and DPH shall prepare periodic reports on behalf of the Water Supply Coordinating Council (WSCC) for the Governor and the General Assembly summarizing the progress towards completion of the projects identified in the report. The first report shall be submitted on or before December 31, 2003, with additional reports submitted at least annually.

(c)The principal duty of the Council shall be to work cooperatively with WRA, DGS, DNREC, and DPH to continue to achieve water supply self sufficiency in northern New Castle County, and to develop and publish water supply plans for southern New Castle County, Kent County and Sussex County. These plans shall identify and describe uses, localities or areas where water supply issues exist and identify and describe localities or areas where future water supply issues may occur. These areas and uses should include, but not be limited to Middletown-Odessa-Townsend, Dover and central Kent County, Coastal Sussex County and agricultural irrigation uses.

These plans shall contain an estimate of existing and future public and private water supplies and water demands through 2030. Private demands shall take into account, to the maximum extent practicable, all domestic, industrial and irrigation uses. Additional duties of the Council shall consist of performing the following specific functions:

(1)The WSCC may explore development of an appropriate funding mechanism to facilitate timely completion of necessary tasks to provide technical input in conducting hydraulic field tests and/or modeling to optimize and expand, where appropriate, water utility connections; and

(2)To work with water utilities to develop cost and capacity agreements subject to approval by the applicable rate-setting authority for the purchase of water supplies during drought and other times emphasizing the need for providers with supply deficiencies to enter agreements which assure adequate supply to customers;

(3) [Repealed.]

72 Del. Laws, c. 409, § 2; 74 Del. Laws, c. 184, § 1; 77 Del. Laws, c. 107, §§ 2-7.;

§ 1307 Recovery of costs of water supply enhancement projects in rates of public utilities.

In the case of a public utility subject to the jurisdiction of the Public Service Commission, upon the determination by the Commission that a water supply enhancement project identified as necessary to assure adequate supply in a report of the Water Supply Coordinating Council has been placed into service by the utility and is used and useful in the provision of public utility service, the public utility shall be entitled to recover, in its rates, its reasonable and prudently incurred capital and ongoing operating costs for such project. Nothing in this section shall preclude the Commission from authorizing an allowance for funds used during construction for any such identified enhancement project.

72 Del. Laws, c. 409, § 3; 74 Del. Laws, c. 184, § 1.;

§ 1308 Length of service for the Water Supply Coordinating Council.

The designation of the Water Supply Coordinating Council, and the duties and responsibilities conferred by this section shall end on January 31, 2022.

72 Del. Laws, c. 409, § 4; 74 Del. Laws, c. 184, § 1; 77 Del. Laws, c. 107, § 8; 80 Del. Laws, c. 108, § 1.;

CHAPTER 108 FORMERLY
HOUSE BILL NO. 183 AS AMENDED BY
HOUSE AMENDMENT NO. 1

AN ACT TO AMEND TITLE 26 OF THE DELAWARE CODE RELATING TO PUBLIC UTILITIES.

WHEREAS, it is the declared policy of this State that clean and plentiful water supplies are the basis for a prosperous domestic, industrial, commercial, agricultural, and tourism economy in Delaware; and

WHEREAS, depending on the variability of weather and the climate, Delaware's water supplies may be impacted by droughts of the levels experienced in 1995, 1999, and 2002; and

WHEREAS, the Delaware Water Supply Coordinating Council ("WSCC") is charged with performing water supply planning and management to ensure surplus water supplies to meet peak demands during the drought of record in New Castle, Kent, and Sussex Counties; and

WHEREAS, the water purveyors on the WSCC have implemented over 2 billion gallons of water supply storage projects in northern New Castle County since the drought of 1999 and completed water supply planning for southern New Castle County to 2030; and

WHEREAS, the WSCC is responsible for recommending funding and completing water supply planning and management projects including exploration of groundwater reserves to carry out its mission; and

WHEREAS, a dedicated, equitable, and sustainable source of revenue is needed to fund water supply planning and management projects to ensure surplus water supplies to meet future demand; and

WHEREAS, the WSCC is due to sunset on January 1, 2016, and should be reauthorized to January 1, 2022, to prepare and implement water supply plans in Kent and Sussex Counties;

NOW, THEREFORE:

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

Section 1. Amend § 1308, Title 26 of the Delaware Code by making deletions as shown by strike through and insertions as shown by underline as follows:

§ 1308. Length of service for the Water Supply Coordinating Council.

The designation of the Water Supply Coordinating Council, and the duties and responsibilities conferred by this section shall end on ~~January 1~~ January 31, ~~2016~~ 2022.

Approved July 15, 2015

After 22 years and 31 days since the appointment by Governor Executive Order No. 74, the responsibilities of the Temporary Water Coordinator for New Castle County will be complete with the sunset of the WSCC on January 31, 2022.

Frequency and intensity of extreme drought in the Delaware Basin, 1600–2002

G. J. Kauffman[1] and K. J. Vonck[2]

Received 26 October 2009; revised 22 January 2011; accepted 7 February 2011; published 18 May 2011.

[1] The frequency and severity of drought in the Delaware Basin between 1600 and 2002 are examined using the Palmer Drought Severity Index (PDSI) estimated from tree ring data and correlated with reconstructed annual low flows. In the Delaware Basin, the most severe drought in nearly a century occurred during 1995–2002 as the Brandywine River, Delaware's largest surface water supply, ran dry at its mouth and declined to the lowest flow on record since 1912. To evaluate the long-term context of the 1995–2002 droughts given a variable hydroclimate, tree ring and PDSI data were correlated to reconstruct flows along the river to 1600, the beginning of European exploration to the Delaware Bay. Reconstructed PDSI and low flows were fit using general extreme value (GEV) distributions to estimate drought frequency. Some variability is present as reconstructed low flows tend to overestimate recorded streamflow in severe dry years, a finding reported by others. Some uncertainty appears in the correlations as the coefficient of multiple determination (CRSQ) between recorded and estimated PDSI from tree ring data is 0.50–0.54, a level of variance considered to be "quite good," and the coefficient of determination (r^2) between PDSI and low flow is 0.52. Given the uncertainty, PDSI and reconstructed low flow data both agree that the most extreme drought in 400 years occurred during 1635, and the drought of 1995–2000 was historically extreme with differences only in the degree of severity. On the basis of PDSI, the 2002, 1999, and 1995 droughts were the sixth, twelfth, and seventeenth most severe in 400 years with frequencies of once every 50, 33, and 16 years, respectively. Based on low flow, the 2002, 1999, and 1995 droughts were the second, fourth, and ninth most severe since 1600 with frequencies of once every 200, 100, and 50 years, respectively. The record drought of 2002 has a low probability of reoccurring in any given year (2.0% by PDSI and 0.5% by low flow), but droughts nearly as severe have occurred during the 1630s, 1680s, 1820s, 1840s, 1860s, 1930s, 1940s, and 1960s. Increased intensities of drought low flows in Delaware during the late twentieth century through 2002 were coincident with population growth, watershed urbanization, and atmospheric warming although these associations were not correlated and further study is needed. Over 400 years of tree ring, PDSI, and reconstructed streamflow data indicate that the Delaware Basin record drought of 1995–2002 was a historically severe event with important implications for water supply and drought management. Droughts more severe than the record 2002 event have occurred in the past, and droughts may become even more intense should watershed urbanization and atmospheric warming continue in the future.

Citation: Kauffman, G. J., and K. J. Vonck (2011), Frequency and intensity of extreme drought in the Delaware Basin, 1600–2002, *Water Resour. Res.*, *47*, W05521, doi:10.1029/2009WR008821.

1. Introduction

[2] In the Delaware Basin, the most severe drought of record in nearly a century occurred during 1995–2002 on the basis of precipitation measurements dating to 1895 and stream gage data dating to 1912 [*Donnelly et al.*, 2003]. The Delaware Water Supply Coordinating Council (WSCC) reevaluated the historic severity of the 2002 drought since water supply design criteria are based on safe yield for the drought of record. Since precipitation and streamflow records cover only the last 100 years, the objectives of this research were (1) to utilize tree ring width and Palmer Drought Severity Index (PDSI) data to extend the instrumental record and (2) to evaluate the severity of the 1995–2002 drought over a long-term historic context dating to 1600, the beginning of European settlement to the Delaware Bay.

[3] Within the Delaware Basin, the Christina Basin provides drinking water to over 500,000 people in Delaware or 60% of the state's population. The Christina Basin is

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[2]Department of Public and Environmental Affairs, University of Wisconsin-Green Bay, Wisconsin, USA.

0043-1397/11/2009WR008821

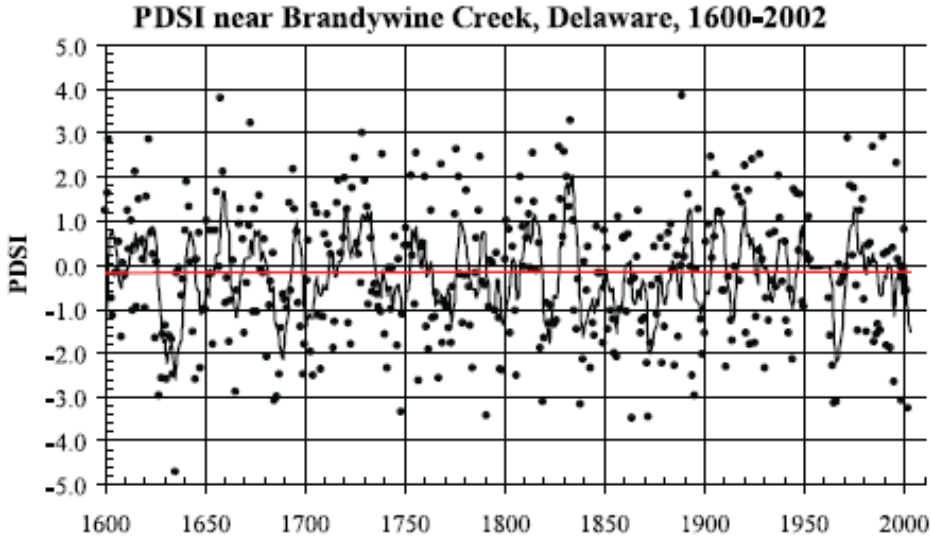

Figure 6. Reconstructed PDSI in the vicinity of Brandywine Creek, Delaware, 1600–2002. The smoothed line is a 5-year moving average. The linear trend line is depicted in red.

Table 6. Most Severe Droughts[a]

Rank	Year	Low Flow[b] (mgd)	Low Flow[c] (MLD)
1	1635	17	64
2	2002	21	79
3	1966	27	101
4	1999	30	113
5	1932	31	117
6	1791	32	120
7	1864	32	120
8	1872	32	120
9	1995	32	120
10	1748	34	128
11	1941	34	128

[a]Data based on reconstructed annual daily low flows along the Brandywine Creek at Chadds Ford, Pennsylvania, 1600–2002.
[b]Here mgd means million gallons per day.
[c]Here MLD means million liters per day.

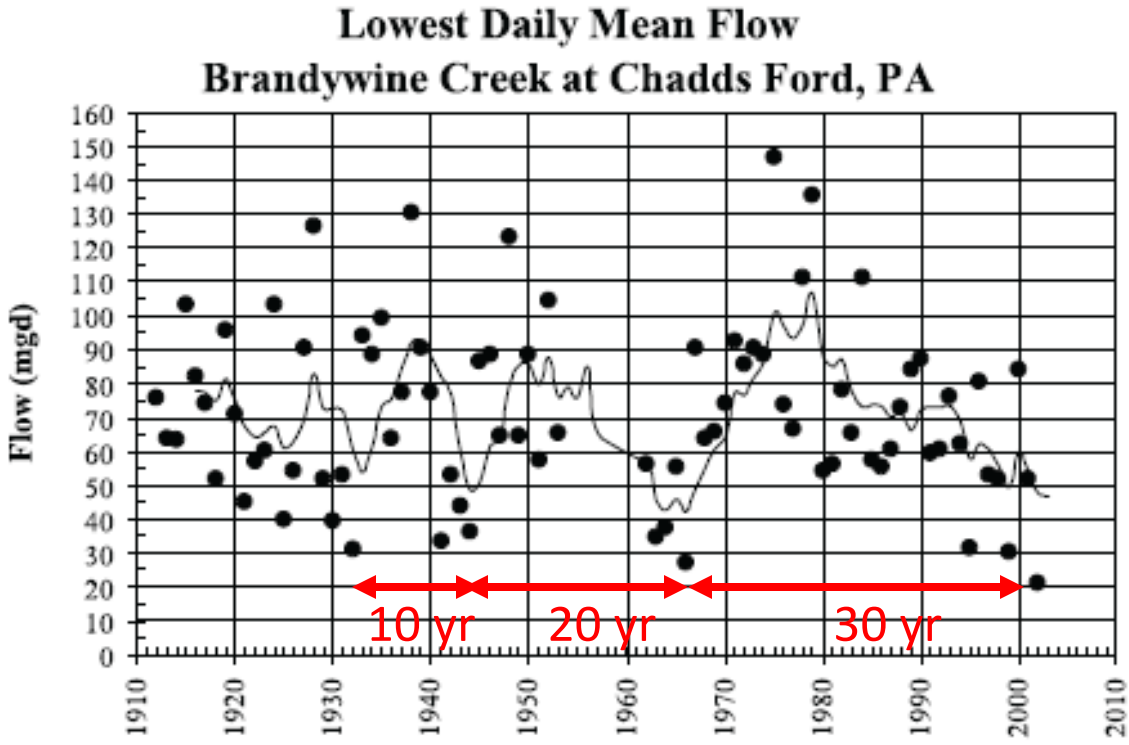

Figure 3. Lowest daily mean flows along the Brandywine Creek at Chadds Ford, Pennsylvania, USGS stream gage 01481000. The smoothed line is a 5 year moving average illustrating extended droughts during the 1920s, 1930s, 1940s, 1960s, and 1995–2002 (USGS).

It's been two decades since the drought of 2002 so if droughts run in 10-, 20-, and 30-yr cycles in Delaware are we due for another drought?