

Work Plan

Estimates of Water Supply and Demand for Kent County and Sussex County, Delaware through 2030

October 31, 2009, rev. November 24, 2009

Prepared by:

Subcommittee of the Delaware Water Supply Coordinating Council

Prepared for:

Delaware Water Supply Coordinating Council

Estimates of Water Supply and Demand for Kent County and Sussex County, Delaware through 2030

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Background

The Delaware Water Supply Coordinating Council Act of 2003 authorized the WSCC 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”.

In July 2009, Governor Markell signed Senate Bill 72 that was passed on June 24, 2009 by the House of the 145th General Assembly, SB 72:

“ ... reauthorizes the WSCC plans to develop water supply and demand plans for Kent County and Sussex County through 2030; and (5) extends the existence of the Water Supply Coordinating Council from January 1, 2010 to January 1, 2016”. On May 5, 2009, the WSCC approved a draft outline for the Kent County and Sussex County work plan and authorized a subcommittee to prepare a scope of work due by June 30, 2009. The intention is to begin work during 2009 with a goal to complete the plan by December 2010. The plan will be transmitted as the 11th or 12th Report to the Governor and General Assembly Regarding the Progress of the Delaware Water Supply Coordinating Council.

This scope of work was prepared by the following WSCC subcommittee:

| | |
|-------------------|---|
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| Richard Krautz | Sussex County |
| Mary Ellen Gray | Kent County |
| Rick Duncan | Delaware Rural Water Association |
| Tom Roth | Town of Henlopen Acres (Sussex County Association of Towns, SCAT) |
| Kelly Glenn | Sussex Shores Water Co. |
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| Sheila Shannon | Tidewater Utilities |
| Jonathan Urbanski | Delaware State Golf Association |
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Scope of Work

1. Introduction

1.1 Purpose and Scope – The purpose of this investigation is to provide an assessment of water resources in Kent and Sussex counties that will include evaluation of groundwater availability, historic and current water use, current water allocations, and projections of future water requirements through 2030. This work is designed to address anticipated increases in water demands, provide information that can be used to support implementation of programs and policies relating to the management, development, conservation, and protection of the State’s water resources.

Challenges:

- 1- Delaware’s population in Kent and Sussex counties is expected to continue to grow with a projected increase of 62,000 and 96,000 by 2030 in Kent and Sussex counties, respectively. Water demand increases with increases in population as does the amount of wastewater that must be treated and discharged to either surface water or groundwater.
 - 2- If history is an indicator, changes in land use could threaten the availability of clean water. In addition, contamination resulting from man’s activities (nutrients, chlorides, pharmaceuticals, etc.) as well as naturally occurring contaminants such as arsenic, radium, iron, chlorides, etc.) may reduce the availability of water.
 - 3- Irrigated cropland is expected to increase, especially during periods of drought. Although cropland in Kent and Sussex counties has decreased from 423,000 acres in **1987** to 398,000 acres in **2002**, the amount of irrigated cropland has increased from 58,700 acres in 1987 to 94,000 acres in 2002. This increase trend in irrigated cropland is expected to continue to increase with an accompanying significant increase in water use.
- 1.2. Role of Delaware Water Supply Coordinating Council (UDWRA) - In August 2003 the Governor signed HB 203 which reauthorized the Delaware Water Supply Coordinating Council to January 1, 2010, expanded the WSCC to include statewide representation, and appointed the Delaware Geological Survey and University of Delaware Water Resources Agency as voting members. The WSCC was originally created in July 2000 when Governor Carper signed House Bill 549 which appointed the committee members and designated the UDWRA as State Water Coordinator (Temporary Water Coordinator for New Castle County). HB 549 also appointed the DGS, DNREC, and UDWRA to serve as technical advisors to the WSCC. In July 2009, Governor Markell signed Senate Bill 72 extending the role of the WSCC through January 1, 2016.

2. Demographics/GIS Mapping

- 2.1. Population (UDWRA) – Gather population data for 2005, 2010, 2020, and 2030 from the Delaware Population Consortium compiled by the University of Delaware Center for Applied Demography and Survey Research (CADSR). Include population data from the 2010 U. S. Census. Projected residential water demands through 2030 will be based on population projections. As of October 2008, the population of Kent County is projected to increase 20% from 159,980 in 2010 to 190,867 by 2030. The population of Sussex County is projected to increase 38% from 197,313 in 2010 to 272,313 by 2030.
- 2.2. Housing Units (UDWRA) – Gather housing unit data and projections through 2030 from CADSR and from the County Comprehensive Plans to estimate per dwelling water use.

2.3. Land Use/Zoning (UDWRA) – Map and compile land use/land cover from 2007 digital orthophotographs prepared by the State of Delaware and from the County Comprehensive Plans. Obtain zoning mapping from County Comprehensive Plans to estimate future land uses through 2030 as a way to project future water needs.

2.4. Comprehensive Plans (UDWRA) – Obtain demographic and planning data from and integrate with the Kent County (adopted October 2008) and Sussex County (adopted June 2008) Comprehensive Plans. Integrate the water supply plan with the comprehensive plans of the following municipalities:

| | | |
|----------------|----------------|---------------|
| Bethany Beach | Harrington | South Bethany |
| Bridgeville | Laurel | Wyoming |
| Camden | Lewes | Viola |
| Cheswold | Milford | |
| Clayton | Millsboro | |
| Dagsboro | Millville | |
| Delmar | Milton | |
| Dewey Beach | Ocean View | |
| Dover | Rehoboth Beach | |
| Fenwick Island | Seaford | |
| Georgetown | Selbyville | |
| Greenwood | Smyrna | |

2.5. Water supply service areas CPCN map (UDWRA) – Update and map the water supply service areas as delineated by Certificates of Public Convenience and Necessity (CPCNs) approved by the Public Service Commission. Approved public water supply service areas in Kent and Sussex Counties include:

| <u>Kent County</u> | <u>Sussex County</u> | |
|------------------------|-----------------------------|-------------------------|
| Artesian Water Company | Artesian Water Company | Sussex County Council |
| Camden- Wyoming Sewer | Bethany Beach | Sussex Shores Water Co. |
| Clayton | Blades | Tidewater Utilities |
| Dover | Bridgeville | |
| Felton | Dagsboro | |
| Frederica | Delmar | |
| Harrington | Frankford | |
| J.H. Wilkerson & Son | Georgetown | |
| Magnolia | Greenwood | |
| Milford | J.H. Wilkerson & Son | |
| Pickering Beach Water | Laurel | |
| Smyrna | Lewes Board of Public Works | |
| Tidewater Utilities | Long Neck Water Company | |
| | Milford | |
| | Millsboro | |
| | Milton | |
| | Rehoboth | |
| | Seaford | |
| | Selbyville | |

2.6. Interconnected systems map (UDWRA) – Gather information from the water purveyors and prepare a regional, interconnected systems map using GIS depicting water lines, interconnections, water tanks, and pumps, and other infrastructure.

3. Hydrogeology and Groundwater Availability (DGS)

3.1. Hydrogeology (DGS) – Groundwater is an essential natural resource and the sole source of drinking water in Kent and Sussex counties. Eight major aquifers are available in Kent County and seven are used in Sussex County. The DGS will compile an annotated outline of hydrogeologic units and their general water-bearing properties. This will be accompanied by a lithostratigraphic/hydrostratigraphic chart, a series of cross sections showing aquifers and confining units, a series of maps showing the aerial extent, thickness, identifiable aquifer facies, and elevations of the tops of aquifers. A listing of GIS products related to the geometries of aquifers will be made available. The DGS will also compile an annotated outline of previously conducted groundwater availability studies. The annotations will indicate the strengths and weaknesses of the study methods and results with a goal of identifying their applicability to use in modern planning practices and land use and permitting decisions.

4. Water Quality

4.1. Existing water quality (DNREC, DPH, and UDWRA) - Conduct a literature review using DGS, USGS, and Division of Public Health sources. Summarize existing water quality of groundwater in Kent and Sussex Counties for parameters such as nutrients, radon, bacteria, and chlorides. Compare groundwater quality to Delaware drinking water standards.

4.2. Source water protection (UDWRA and DNREC) - Summarize source water protection programs implemented by governments with year round populations over 2000 in complying with the Delaware Source Water Protection Law of 2001.

5. Water Supply

5.1. Allocated water users (DGS, DNREC, DDA, and DSGA) – DNREC will provide tables of allocation permits (systems using >50,000 gallons per day) including a listing of individual facilities (wells and intakes) by allocation permit. One table will consist of ground water allocations, and the other surface water allocations, each segregated by county.

- Public community systems (water utilities and municipalities)
- Public non-community systems (non-transient/transient)
- Irrigation (farms, golf courses, nurseries, wastewater reuse)
- Industrial

5.2 Domestic wells (DNREC) - DNREC will provide counts of domestic well permits segregated by county

5.3 Public Non-Community systems (not allocated) - DNREC and DPH will provide tables of public non-community systems with populations served (permanent and seasonal) along with estimated usage, segregated by county.

6. Water Demands

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6.1. Existing public water demands (UDWRA, DGS, DNREC) - The agencies will provide an estimate of the amount of water used monthly and annually from 2004 through 2008 for water users tabulated in Task 5. 2010 water demands will be calculated for average and maximum daily, monthly, and annual demand. Obtain per capita use estimates of water demand and verify estimates using population and housing unit data. Verify estimates of water demand with wastewater projections contained in the County comprehensive plans. Demands will be segregated by county.

6.2. Existing domestic water demands (UDWRA, DGS, DNREC) - Estimate 2010 domestic water demands using well counts and parcels not served by water systems and typical per dwelling consumption, segregated by county.

6.3. Existing irrigation water demands (DGS, DNREC, DDA, DSGA) – The DGS will work with DNREC, DDA and UDWRA to estimate 2010 water demands to support agricultural irrigation (dry, normal, and wet seasons), segregated by county. Discuss new efforts to utilize treated wastewater on farms and efforts to increase agriculture irrigation in order to reduce pollutant run-off.

6.4. Existing industry water demands (DGS, DNREC, and UDWRA) - Calculate 2010 industrial water demands, segregated by county.

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7. Future Water Demands

Estimate future water demands for 2020 and 2030 (UDWRA). Future public water supply demands will be based in part on population projections by census block, water purveyor, and municipality and future land use projections in town and county comprehensive plans. Future commercial and industrial water demands will be based on estimates gathered from the Delaware Economic Development Office and county comprehensive plans.

7.1. Future public water demands

7.2. Future individual residential water demands

7.3. Future irrigation water demands

7.4. Future self supplied industry water demands

7.5. Comparison of supply and demand (UDWRA) - Compare existing water supply to current and future demand to determine whether surplus or deficits are projected in the future through 2030

8. Conclusions/Recommendations

8.1. Conclusions

8.2. Recommendations

9. References

10. Appendices Schedule

| <u>Task</u> | <u>Milestone</u> |
|--|------------------|
| Commence work | Oct 2009 |
| 1. Introduction | Dec 2009 |
| 2. Demographics and mapping | Jan 2010 |
| 3. Hydrogeology and Groundwater Availability | June 2010 |
| 4. Water Quality | Mar 2010 |
| 5. Water Supplies | June 2010 |
| 6. Water Demands | Jul 2010 |
| 7. Future Water Demands | Aug 2010 |
| 8. Conclusions/Recommendations | Dec 2010 |
| 9. References | |
| 10. Appendices | |
| Draft Report | Mar 2011 |
| Final Report | Jun 2011 |