

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION *
OF ARTESIAN WATER COMPANY, INC. *
FOR AUTHORITY TO INCREASE RATES *
AND CHARGES FOR WATER SERVICE *
(Filed April 11, 2014) *

PSC Docket No. 14-_____

**DIRECT TESTIMONY OF
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ARTESIAN WATER COMPANY, INC.**

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April 11, 2014

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1 **I. NATURE OF TESTIMONY**

2 **Q. Please state your name and place of employment.**

3 A. My name is C. Thomas deLorimier, and I work for Artesian Water Company, Inc.
4 (“AWC” or the “Company”), 664 Churchmans Road, Newark, Delaware.

5 **Q. What is your occupation?**

6 A. I am the Manager of Engineering for AWC and I am principally responsible for
7 engineering and construction for capital projects supporting the Company’s operations.

8 **Q. What subjects are addressed in your testimony?**

9 A. My testimony provides a discussion of: (1) the engineering considerations involved in
10 the design of a water system; (2) AWC’s water system and the Company’s efforts to
11 assure supply to meet the current and future demands of its customers; and (3) the
12 significant non-revenue generating utility plant additions that AWC expects to place into
13 service during the last three quarters of the Test Period (January through September
14 2014).

15 My testimony is accompanied by a number of exhibits. The analyses presented in
16 my testimony and the accompanying exhibits were conducted either by me or under my
17 direct supervision.

18 **II. EDUCATIONAL AND PROFESSIONAL BACKGROUND**

19 **Q. Please describe your educational and professional background.**

20 A. I received a Bachelor of Engineering degree from Virginia Polytechnic Institute and State
21 University, majoring in Civil Engineering, in 1976. I am currently licensed as a
22 Professional Engineer in six states: Delaware 5947, Maryland 20715, Pennsylvania PE-
23 048683-R, New Jersey GE-38810, Virginia 041597, and Ohio 70550.

1 I began my professional career as a Civil Engineer with the Delaware Department
2 of Transportation in July 1976. In that position, my primary responsibilities were the
3 development and implementation of public transportation policy and capital improvement
4 programs focused on the Public Bus System in and around the City of Wilmington,
5 Delaware.

6 In October 1984, I accepted a position with the Delaware Administration for
7 Regional Transit (DART) in Wilmington, Delaware, as the Support Service Manager.
8 My principal responsibilities were directing and managing the facility operations and new
9 construction for the DART bus company. I was responsible for the preparation and
10 bidding of technical specifications for all capital assets and also managing the following
11 programs: safety program, revenue collection system, environmental compliance issues,
12 daily operation of the capital facilities, and the reduction of operating costs for all of
13 DART's capital facilities.

14 In 1986, I became the Deputy Director of Public Works for Cecil County,
15 Maryland. For eight years, I managed the staff of 100 employees in three divisions that
16 maintained eight water and wastewater treatment plants, 500 miles of roads, 99 bridges,
17 and a central county landfill. Through the engineering department, I provided daily
18 operational management and engineering to the assets of these three divisions.

19 In 1994, I joined the staff of Tatman & Lee Associates, which eventually became
20 the URS Corporation. As a Senior Project Manager, I specialized in the design and
21 operation of conventional and alternative sanitary sewer systems, wastewater treatment
22 plants, water distribution systems, and water treatment plants. My responsibilities
23 encompassed consulting, engineering, project management, planning, design, preparation

1 of permit and funding applications, construction management, construction inspection,
2 operation of water and wastewater facilities, and operational and maintenance assistance
3 to numerous municipalities and counties throughout Pennsylvania, Maryland, and
4 Delaware.

5 In 2000, I was promoted to the Office Manager position of the URS Wilmington
6 office. For ten years I managed environmental, civil and municipal engineers as well as
7 planners in the Wilmington, Delaware area. During that time, we opened a branch office
8 in southern Delaware and expanded services to over a dozen new municipalities,
9 primarily in connection with the planning and designing of both water and wastewater
10 treatment facilities. While at URS from 2009 to 2013, I served as the National Client
11 Account Manager to the American Water Company and other private water utilities in the
12 region. Nationally, I assisted URS offices in marketing, managing, and executing projects
13 specifically focused on the private water utility business. This position allowed me to
14 visit private water offices throughout the country and assist URS offices in providing a
15 full range of services to several national private water clients.

16 In 2011, I was promoted to the Mid-Atlantic Water/Wastewater Business Line
17 Leader for the region surrounding Delaware. I assisted 12 URS offices in six states with
18 water and wastewater pursuits, key hires, and other tasks to grow the Water/Wastewater
19 business within the region.

20 In September 2013, I was hired as AWC's Manager of Engineering. My principal
21 responsibilities are to review, quantify, and document the Company's water supply
22 capabilities and to undertake hydraulic studies and make recommendations for system
23 improvements. I have been involved in the design and construction of numerous

1 improvements. Additionally, I have been involved with regulatory reporting, project
2 permitting, addressing water quality issues, including hydraulic improvements to improve
3 quality and availability, as well as water treatment studies.

4 **Q. How has your previous experience with Municipal, County, and State agencies been**
5 **helpful in your current position?**

6 A. I have worked either directly or indirectly for the State of Delaware and Cecil County
7 Government over the past thirty-seven years and was either involved with and/or
8 responsible for operations that provided essential public services on a 24/7 basis. This
9 experience has given me an excellent opportunity to understand water systems and how
10 to support operations at AWC. As Cecil County's Deputy Director of Public Works from
11 1986-1994, I was responsible for the four public water systems that are now the water
12 systems owned by the Company. These experiences have prepared me well for my new
13 position at the Company.

14 **Q. How has your experience as a consultant designing water and wastewater projects**
15 **been helpful in your current position?**

16 A. During my time as a consultant, I designed numerous water and wastewater treatment
17 plants that provided services to populations in Delaware, Maryland, and Pennsylvania.
18 Most of those systems were comparable in size and complexity to those that are operated
19 by AWC.

20 **Q. Are you active in any professional organizations?**

21 A. Yes. I am a Registered Professional Engineer in the State of Delaware and five other
22 states in the region. I am a member of several professional organizations, including the
23 Delaware Association of Professional Engineers, the American Water Works

1 Association, the American Public Works Association, and the American Council of
2 Engineering Companies. I am currently serving as the President of the Delaware Chapter
3 of the American Public Works Association.

4 **Q. Have you previously testified on water and wastewater related issues?**

5 A. I have testified on a number of water and wastewater related issues before civil courts
6 and planning boards as an expert witness. I have served on a number of advisory
7 committees and panels. I have also represented clients in connection with construction
8 permits before the Delaware River Basin Commission and the Susquehanna River Basin
9 Commission.

10 **III. WATER SYSTEM DESIGN**

11 **Q. Why is it vital to have a public water system rather than to allow our citizens to**
12 **maintain their own private wells?**

13 A. Having a public water system is the most cost-efficient way to provide high-quality
14 water, to ensure a reliable water supply, and to deliver dependable water service to the
15 public. Individual, private wells are more susceptible to contamination and salt intrusion.
16 There is no systematic quality control or monitoring available for private wells. Finally,
17 water supply from private wells cannot assure our State's population adequate fire
18 protection, nor can that supply be considered reliable during a power outage. By way of
19 example, AWC customers continued to have reliable water service during Hurricane
20 Isabel in 2003 when power outages lasted several days, while those homeowners on
21 private wells had no water service.

1 **Q. To help frame the development and features of the projects for which AWC seeks**
2 **recovery in rates, please describe the overall engineering considerations involved in**
3 **the design of a system to provide water to customers.**

4 A. There are four basic components to a water system: (1) source of supply; (2) treatment;
5 (3) storage; and (4) distribution. An engineer must consider several factors when
6 designing a water system. First and foremost, the engineer must consider both the current
7 and the foreseeable future level of need for water. Then, using the estimated current and
8 future need for water as a starting point, the various possible alternative solutions that
9 could be implemented to meet that need must be evaluated. The evaluation of possible
10 alternative solutions itself requires the consideration of a number of factors.

11 **Q. What are those factors?**

12 A. The evaluation of possible alternative solutions includes assessing the capacity of any
13 given solution to supply the needed quantity and quality of water. The evaluation also
14 requires consideration of the level of complexity of the solution. In addition, the safety
15 of both the end-users and those who are in daily contact with the equipment associated
16 with the solution must be considered, along with the reliability of the solution. Finally,
17 the costs associated with the solution must be evaluated. In each case, the goal is to
18 select the most cost-effective solution without jeopardizing the ability to meet anticipated
19 demand. These factors and how each relates to the four basic components of a water
20 system are discussed in greater detail in **CTD Exhibit 1**.

21 **Q. From an engineering standpoint, do you approach designing the components of a**
22 **water system for new customers on a customer-by-customer basis?**

1 A. No. If we took a customer-by-customer approach, everyone would be getting their water
2 from individual wells. As I stated earlier, we consider both the current and the
3 foreseeable future level of need for water over time. In other words, we consider how
4 many new customers need water immediately as well as the rate at which new customers
5 will be added to the system in the future. We then design a cost-efficient system to match
6 those needs.

7 Regulatory requirements may add to the complexity of installing a cost-effective
8 solution. For example, there is currently a requirement that a project included in rate
9 base must be 75% used and useful within three years. That may require the Company to
10 install interim facilities which, although they may meet the initial needs of a community,
11 are undersized to meet the community's ultimate needs. It may, therefore, be necessary
12 to replace equipment or facilities with facilities of greater capacity long before the
13 original equipment's useful life is realized.

14 **IV. AWC'S WATER SYSTEM**

15 **A. Overview**

16 **Q. Provide an overview of AWC's water system.**

17 A. The Company's water system extends over 273 square miles in Delaware, serving about
18 80,000 customers statewide. AWC's water systems can be considered separately by
19 Delaware county - New Castle County, Kent County, and Sussex County.

20 In New Castle County AWC has one large integrated system serving over 71,000
21 customers (the "Main System"), plus five individual systems located southern New
22 Castle County. Before 2004, when the Company directionally drilled a pipeline under
23 the C&D canal, there were nine separate systems in southern New Castle County in
24 addition to the Main System in northern New Castle County. Since that time, we have

1 integrated four southern New Castle County Systems into the Main System. Our Main
2 System now extends from the Pennsylvania border to Townsend, Delaware. In terms of
3 reliability, integrated systems provide multiple sources of supply for back-up purposes.

4 AWC has six individual water systems in Kent County and five individual water
5 systems in Sussex County. Each water system is separately described in the sections
6 below.

7 **B. New Castle County**

8 **Q. Describe the Company's water systems in New Castle County.**

9 A. AWC's water service territory extends over 125 square miles in New Castle County as
10 shown in **CTD Exhibit 2A** and is broken into the following six water systems: New
11 Castle County Main System; Delaware Correctional Center ("DCC"); Commodore
12 Estates; Augustine Creek; Bayview; and Odessa Woods. Each system will be described
13 in detail below. The Company currently serves over 71,300 customers in New Castle
14 County.

15 **Q. Describe the New Castle County Main System.**

16 A. The New Castle County Main System is divided into ten hydraulic service levels
17 categorized by elevation changes. It is considered to be one system as water is readily
18 transferrable between service levels. The Company serves over 71,000 metered
19 customers in this portion of its service territory.

20 **Q. Describe each of the hydraulic service levels in New Castle County?**

21 A. The ten hydraulic service levels identified by their geographic location as shown in **CTD**
22 **Exhibit 2A** are: 1 – Route 40; 1A – Maryland Connection; 2 – Kirkwood Highway;
23 3PC – Pike Creek; 3SP – Sherwood Park; 3LP – Lancaster Pike; 4 – Hockessin; 5PM –
24 Penn Manor; 5OWR – Old Wilmington Road; and 10 – Southern New Castle County.

1 **Q. How is water readily transferred between the hydraulic service levels in New Castle**
2 **County?**

3 A. Water is readily transferred through a series of booster pumping stations and pressure
4 reducing valves (“PRVs”). There are eleven booster stations in New Castle County, each
5 with back-up power to transfer water from lower to higher elevation hydraulic service
6 levels. There are fifteen PRVs in New Castle County that transfer water from higher to
7 lower elevation hydraulic service levels. Both the PRVs and booster stations are further
8 described in **CTD Exhibit 3.**

9 **Q. What are the sources of supply for AWC’s New Castle County Main System?**

10 A. There are a total of 71 wells in 26 well fields in the New Castle County Main System.
11 These wells are permitted by the Department of Natural Resources and Environmental
12 Control (“DNREC”). They are allocated for a total withdrawal of approximately 32
13 million gallons per day (“MGD”) at the individual allocation limits specified in **CTD**
14 **Exhibit 4.**

15 **Q. Describe the use of the Aquifer and Storage Recovery Well in Service Level 1.**

16 A. AWC has one Aquifer and Storage Recovery (“ASR”) well identified as the Llangollen
17 ASR well. ASR involves the use of a well to recharge the aquifer during the winter
18 months when excess water supply is available, then pumping from the same well to
19 recover the recharged water during the summer to meet peak demands. The data
20 presented in the table below summarizes the cycle of storage and recovery in the
21 Llangollen ASR well over the past 8 years beginning with the 130 million gallons
22 (“MG”) in storage in 2006.

23

| CURRENT CYCLE/YEAR | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| AMOUNT INJECTED DURING CURRENT CYCLE (MG) | | 97 | 89 | 90 | 102 | 95 | 63 | 54 |
| TOTAL STORAGE AVAILABLE FOR USE (MG) | 130 | 135 | 132 | 167 | 163 | 182 | 133 | 80 |
| AMOUNT RECOVERED DURING CURRENT CYCLE (MG) | 92 | 92 | 55 | 106 | 76 | 112 | 107 | 63 |
| TOTAL REMAINING IN STORAGE (MG) | 38 | 43 | 77 | 61 | 87 | 70 | 26 | 17 |

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Q. What interconnections are in New Castle County?

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A. AWC has a total of eighteen interconnections in New Castle County, of which thirteen

10

interconnections are in Northern New Castle County as further described in **CTD Exhibit**

11

5. Average day capacity is the amount of water that is available through each of these

12

interconnections under normal demand conditions. Maximum monthly capacity reflects

13

the hydraulic capacity of the interconnection to flow water. Although a number of these

14

interconnections provide for the transfer of water in either direction (either to AWC from

15

a neighboring utility, or from AWC to the neighboring utility), the Company can

16

purchase nearly 13 MGD during normal conditions and about 14 MGD during peak

1 demand conditions in northern New Castle County. The interconnections, however, may
2 be limited by the supply available to the provider during drought periods.

3 AWC has contractual obligations to purchase water through one interconnection
4 with the Chester Water Authority ("CWA"), in Service Level 5PM. This interconnection
5 has been maintained since 1992. The agreement currently obligates the CWA to provide
6 up to 6.0 MGD to AWC. In return, the Company must purchase a minimum of 2.0 MGD
7 on any given day and an average of 3.0 MGD on a yearly basis. The agreement allows
8 AWC to purchase greater quantities of water as needed. AWC is contractually required
9 to purchase a minimum of 3.0 MGD through this interconnection on an annual basis
10 through the year 2021.

11 In 1998, AWC entered into an agreement with the Town of Middletown in
12 southern New Castle County whereby the Company would provide water service to all
13 developments outside of the incorporated limits of the Town as it existed in 1997. AWC
14 transfers water to Middletown through four interconnections located on Industrial Drive,
15 Route 299, Route 301, and Bunker Hill Road. AWC transfers water from Middletown to
16 customers within the Main System through a fifth interconnection at Green Giant Road.
17 These interconnections enable the Company to freely move water to the Town to meet
18 the current growth and to transfer water through the Town to meet AWC's needs as
19 conditions warrant.

20 **Q. What type of treatment is required in New Castle County?**

21 A. Sodium hydroxide (caustic) or calcium oxide (lime) for pH adjustment, sodium
22 hypochlorite or chlorine gas for disinfection, a corrosion inhibitor and fluoride are used at
23 most treatment facilities in New Castle County. Aeration is used at many of the facilities

1 to reduce the quantity of chemicals required for pH adjustment. Additional treatment
2 such as filtration for the removal of iron or radium, and carbon contactors for the removal
3 of polychloroethylene (“PCE”), tetrachloroethylene (“TCE”), and bis(2-chloroethyl)ether
4 (“BCEE”), are used at some of the facilities as further described in **CTD Exhibit 6**.

5 **Q. What storage is in the New Castle County Main System?**

6 A. There are twenty-three storage tanks, with approximately 38 MG of capacity in
7 the New Castle County Main System as further described in **CTD Exhibit 7**.

8 **Q. Describe the Distribution System in the New Castle County Main System.**

9 A. There are approximately 993 miles of water main and 4,440 fire hydrants in the
10 New Castle County Main System. Pipe material is primarily ductile iron (“DIP”) with
11 some cast iron (“CI”), galvanized steel (“GALV”), copper, polyvinylchloride (“PVC”),
12 polyethylene (“PE”), asbestos cement (“AC”), steel and high density polyethylene
13 (“HDPE”). Pipe sizes range from 1-inch to 24-inches in diameter.

14 **Q. Describe the individual water systems in New Castle County.**

15 A. As previously mentioned. AWC has five individual water systems in New Castle County:
16 Delaware Correctional Center (“DCC”), Bayview, Commodore Estates, Augustine Creek,
17 and Odessa Woods. These systems, other than the DCC, each provide service to a single
18 residential community. **CTD Exhibit 8** describes each system in terms of number of
19 customers, distribution system, number of wells, treatment required, storage on-site, and
20 availability of back-up power.

21 **C. Kent County**

22 **Q. Describe AWC’s water systems in Kent County.**

1 A. In 1997, AWC began providing water service to several communities in Kent County.
2 Artesian's Kent County service territory is shown in **CTD Exhibit 2B**.

3 In Kent County, the Company is dependent entirely upon groundwater for supply
4 which is supplied from nineteen wells with a total capacity of approximately 3.3 MGD.
5 There are six storage tanks with total system storage of approximately 2 MG. The water
6 distribution system consists of more than 72 miles of pipeline ranging from
7 2-inches to 16-inches in diameter and more than 350 hydrants.

8 AWC currently serves approximately 2,800 customers in Kent County in two
9 regional systems (Church Creek and Windsong) and four individual systems (Deer
10 Meadows, Paradise Estates, Big Oak, and Weatherstone Crossing). Each system will be
11 described in detail below.

12 **Q. Describe the Church Creek water system.**

13 A. The Church Creek water system is located in the center of Kent County extending from
14 the area west of Frederica north to Magnolia along Barretts Chapel Road. It serves the
15 residential developments of Barkers Landing, Church Creek, Chestnut Ridge, Irish Hill,
16 Doe Run, Quail Landing, Riverview Estates, and Riverside as well as commercial
17 development in these areas. There are approximately 1,600 customers on this system,
18 which has eight wells six treatment facilities (Barkers Landing, Riverview, Hunters
19 Ridge, Church Creek, Jonathans Landing and Riverside), and three storage tanks as
20 further described below.

21 **Q. What is the source of supply in the Church Creek system?**

1 A. There are eight wells located in six wellfields in the Church Creek system as further
 2 specified in the table below. The total withdrawal allocated for the Church Creek water
 3 system is 1.1 MGD.

| WELLFIELD | NUMBER OF WELLS | DNREC ALLOCATED WITHDRAW (GPD) |
|-------------------|-----------------|--------------------------------|
| Barkers Landing | 2 | 400,000 |
| Riverview | 1 | 108,000 |
| Hunters Ridge | 1 | 108,000 |
| Church Creek | 2 | 468,000 |
| Jonathans Landing | 1 | Less than 50,000 |
| Riverside | 1 | 93,000 |

11 **Q. What treatment is required in the Church Creek system?**

12 A. Treatment varies at each of the facilities in the Church Creek water system, as shown in
 13 the table below.

| FACILITY | DISINFECTION | IRON REMOVAL FILTERS | CORROSION INHIBITOR | BACKUP POWER |
|-------------------|--------------|----------------------|---------------------|--------------|
| Barkers Landing | Hypochlorite | | Yes | Yes |
| Riverview | Hypochlorite | Yes* | Yes | Yes |
| Hunters Ridge | Hypochlorite | | Yes | Yes |
| Church Creek | Hypochlorite | | Yes | |
| Jonathans Landing | Hypochlorite | | Yes | |
| Riverside | Hypochlorite | Yes* | Yes | |

14 *Potassium Permanganate added

16 **Q. What storage is on the Church Creek system?**

1 A. Storage for the Church Creek water system is provided by a 1 million gallon elevated
2 storage tank (Blessings Tank), located south of Magnolia along Barretts Chapel Road, a
3 40,000 gallon ground storage tank at Barkers Landing, and a 150,000 gallon elevated
4 storage tank at Jonathans Landing.

5 **Q. Describe the distribution system in Church Creek.**

6 A. There are over 40 miles of water main and 209 fire hydrants in the Church Creek water
7 system. Pipe material is variable, consisting of DIP, PE, HDPE, and PVC, with a range
8 of pipe sizes from 2-inches to 16-inches.

9 **Q. Describe the Windsong water system.**

10 A. The Windsong water system is located in the northernmost portion of Kent County and
11 serves the developments of Timber Mills, Windsong, Wicksfield, and Southern View.
12 There are approximately 520 customers on this system which has three wells, three
13 interconnections, two treatment facilities, and a storage tank. The Timber Mills facility is
14 located in the southern portion of the system and the Windsong facility is located in the
15 northern portion of the system near the municipality of Clayton.

16 **Q. What is the source of supply in the Windsong system?**

17 A. Windsong has two wells permitted by DNREC which are allocated for a total withdrawal
18 of 648,000 gallons per day (“gpd”). There is one well permitted by DNREC at Timber
19 Mills which is equipped with a 75 gallons per minute (“gpm”) well pump.

20 **Q. What interconnections are in the Windsong system?**

21 A. AWC has three interconnections in the Windsong system with the municipality of
22 Clayton, located at Route 6, Huntington Mills, and Underwoods Corner Road. Two are
23 two-way interconnections to provide emergency supply and fire protection for AWC’s

1 Windsong system as well as the Town of Clayton. The third interconnection provides
2 supply and fire protection capacity to the subdivisions of Southern View and Wicksfield.

3 **Q. What treatment is required in the Windsong system?**

4 A. Sodium hypochlorite and a corrosion inhibitor are utilized at the Timber Mills and
5 Windsong treatment facilities. Fluoride is added at Windsong. Granular ferric hydroxide
6 (“GFH”) media is utilized for removal of arsenic at Windsong. Back-up power is
7 provided at Windsong.

8 **Q. What storage is in the Windsong system?**

9 A. A 500,000 gallon elevated tank located at Windsong provides storage for the Windsong
10 system.

11 **Q. Describe the distribution system in the Windsong system.**

12 A. There are approximately 17 miles of water main and 79 fire hydrants in the Windsong
13 water system. Pipe material is variable, consisting of DIP, HDPE and GALV, with a
14 range of pipe sizes from 4-inches to 16-inches.

15 **Q. Describe the individual water systems in Kent County.**

16 A. There are four individual water systems in Kent County: Big Oak, Deer Meadows,
17 Weatherstone Crossing, and Paradise Estates. **CTD Exhibit 9** describes each system in
18 terms of number of customers, distribution system, number of wells, treatment required,
19 storage on-site, and availability of back-up power.

20 **D. Sussex County**

21 **Q. Describe the AWC water systems in Sussex County.**

22 A. In 1997, AWC began providing water service to customers in Sussex County as the result
23 of its acquisition of the developer owned and operated Cat Hill and Whites Haven Water

1 Companies in South Bethany. Since then, the Company has expanded its facilities to
2 provide service to other residents of South Bethany, Fenwick Island, Middlesex Beach,
3 Bayville Shores, Keenwick Sound, Keenwick West, and other communities along the
4 Route 54 and Route 20 corridors including Swann Cove and the Refuge at Dirickson
5 Creek. The Company is also serving the communities of Stonewater Creek,
6 Independence, Heron Bay, Beaver Creek, and Holland Mills in the Rehoboth-Lewes area.
7 AWC's Sussex County Service Territory is shown in **CTD Exhibit 2C**.

8 In Sussex County, the Company is dependent entirely upon groundwater for
9 supply, which is supplied from fifteen operating wells with a total capacity of
10 approximately 7.8 MGD. There are four storage tanks with total system storage of
11 approximately 1.7 MG. The water distribution system consists of more than 160 miles of
12 pipeline ranging from 2-inches to 20-inches in diameter and 797 hydrants.

13 AWC currently serves over 5,550 customers in Sussex County in two regional
14 systems (Bayville/South Bethany and Heron Bay) and three stand-alone systems (Cedar
15 Landing, Beaver Creek, and Ingram Village). Each system is described in detail below.

16 **Q. Describe the Bayville/South Bethany water system.**

17 A. There are approximately 4,475 customers on this system which consists of five wells, two
18 treatment facilities, and two storage tanks. The Bayville facility is located in the southern
19 portion of the system along Route 54 and the South Bethany facility is located in the
20 northern portion of the system in the municipality of South Bethany.

21 **Q. What is the source of supply in the Bayville/South Bethany system?**

1 A. Bayville has three wells permitted by DNREC which are allocated for a peak withdrawal
2 of 2,016,000 gpd. South Bethany has two wells permitted by DNREC which are
3 allocated for a peak withdrawal of 2,304,000 gpd.

4 **Q. What interconnections are in the Bayville/South Bethany system?**

5 A. AWC has one emergency interconnection with Tidewater Utilities in the Bayville/South
6 Bethany water system at the Sea Colony development, which in turn, has an
7 interconnection with the Town of Bethany Beach. This interconnection existed at the
8 time the Company acquired the Cat Hill system and is available for emergency use by
9 either water system. Additionally, AWC and the Town of Bethany Beach have
10 arrangements to make a hydrant-to-hydrant interconnection in the event of an emergency.
11 These interconnections provide service among the three water systems, allowing water to
12 be transferred among the water systems during power failures, system outages, etc.

13 **Q. What treatment is required in the Bayville/South Bethany system?**

14 A. Sodium hydroxide, chlorine gas, a corrosion inhibitor, and fluoride are added at the
15 Bayville and South Bethany treatment facilities. Both facilities utilize potassium
16 permanganate and filtration for the removal of iron and manganese. Additionally,
17 aerators and granulated activated carbon are utilized at Bayville. Back-up power is
18 provided at both facilities.

19 **Q. What storage is on the Bayville/South Bethany system?**

20 A. A 1,000,000 gallon elevated tank located at Bayville and a 500,000 gallon elevated tank
21 located at South Bethany provide storage for the Bayville/South Bethany system.

22 **Q. Describe the distribution system in the Bayville/South Bethany system.**

1 A. There are over 60 miles of water main and 320 fire hydrants in Bayville/South Bethany.
2 Pipe material is variable, consisting of DIP, HDPE, PE and PVC, with a range of pipe
3 sizes from 2-inches to 16-inches.

4 **Q. Describe the Heron Bay water system.**

5 A. The Heron Bay water system serves the residential developments of Heron Bay,
6 Stonewater, and Independence. There are approximately 685 customers on this system,
7 which consists of five wells, two treatment facilities, and one storage tank. The
8 Stonewater facility is located in the southern portion of the system and the Heron Bay
9 facility is located in the northern portion of the system.

10 **Q. What is the source of supply in the Heron Bay water system?**

11 A. There are two wells permitted by DNREC at Heron Bay which are allocated for a total
12 withdrawal of 2,448,000 gpd. Three wells permitted by DNREC at Stonewater Creek are
13 allocated for a total withdrawal of 1,728,000 gpd.

14 **Q. What treatment is required in the Heron Bay system?**

15 A. Lime, sodium hypochlorite, and a corrosion inhibitor are added at the Heron Bay facility.
16 Potassium chloride, sodium hypochlorite, corrosion inhibitor and ion exchange units
17 (nitrate removal) are utilized at the Stonewater Creek facility. Back-up power is provided
18 at both facilities.

19 **Q. What is the storage on the Heron Bay system?**

20 A. A 30,000 gallon clearwell is located at the Heron Bay facility. Additionally, there are
21 two (2) 528 gallon hydropneumatic tanks at Heron Bay and two (2) 528 gallon
22 hydropneumatic tanks at Stonewater.

23 **Q. Describe the distribution system in the Heron Bay system.**

1 A. There are over 16 miles of water main and 76 fire hydrants in Heron Bay. Pipe material
2 is variable, consisting of DIP, PVC, HDPE and PE, with a range of pipe sizes from 2-
3 inches to 16-inches.

4 **Q. Describe the individual water systems in Sussex County.**

5 A. There are three individual water systems in Sussex County: Beaver Creek, Cedar
6 Landing, and Ingram Village. **CTD Exhibit 10** describes each system in terms of
7 number of customers, distribution system, number of wells, treatment required, storage
8 on-site, and availability of back-up power.

9 **E. Historical System Delivery**

10 **Q. Historically, what has been the yearly and daily amount of water that has been**
11 **pumped into the AWC systems?**

12 A. **CTD Exhibit 11** reports, in terms of millions of gallons, the amount of water pumped
13 into AWC's systems, which I refer to as "system delivery," annually, daily, and peak-
14 day. In 2013, total system delivery was 7.3 billion gallons, average daily system delivery
15 was 20.08 MGD, and peak-day system delivery was 28.99 MGD.

16 **Q. Please describe the production from the AWC's water facilities over time.**

17 A. The production for each of the Company's wellfields over the past ten years is set forth in
18 **CTD Exhibit 12**. This information demonstrates that pumpage from Company-owned
19 wellfields has increased over the past several years to the point where AWC's reliance on
20 purchased water is now reduced to an amount marginally exceeding our contractual
21 obligations.

22 **Q. Describe AWC's use of these wellfields during the Test Year.**

1 A. Monthly production for the test year, January through December 2013, from each of
2 these wellfields is summarized in **CTD Exhibit 13**. Production for each wellfield is
3 presented in million gallons pumped for each month. Wellfield production is then
4 summed to produce the total self-supply.

5 Monthly production from each wellfield reflects AWC's practice of conjunctive
6 use in accordance with its water-supply plan. Wells and wellfields are rested during the
7 winter and early spring when surface water supplies are plentiful to allow water levels in
8 those wells to recover. This allows production from the wells to be maximized during the
9 summer when demand is high and surface water supplies may become less available.

10 **Q. Are there constraints on pumpage of water from AWC's wells and wellfields?**

11 A. Yes. Most of the wells and wellfields are limited in the amount of water that may be
12 withdrawn by allocation permits issued by the DNREC. The constraints imposed by
13 allocation permits are set forth in **CTD Exhibit 14**.

14 **Q. Please describe the columns in CTD Exhibit 14.**

15 A. The first column identifies each wellfield and well within the system. For each well, the
16 second and third columns reflect the maximum amount of water (in gallons per minute
17 and million gallons per day) that each well may withdraw at any point in time. The
18 fourth, fifth, and sixth columns show the maximum allowable withdrawal for the
19 wellfield for any one day, any 30-day period, and any year, respectively.

20 Finally, the last column shows the maximum allowable level in feet below ground
21 surface (drawdown) to which the water level from each well can be lowered before the
22 Company must reduce pumpage from the well.

23 **Q. Are the wellfields pumping at their permitted rates as shown in CTD Exhibit 14?**

1 A. Generally, the wells and wellfields are pumping at rates less than the pumping limits set
2 forth in the allocation permits.

3 **Q. Why is pumpage not maintained at the maximum quantities allowed by the**
4 **allocation permits?**

5 A. The wells and wellfields are limited in the amount they may withdraw for several
6 reasons. First, well or wellfield total pumpage may not exceed permit limits. This
7 limitation is imposed on an instantaneous, daily, monthly, and annual basis.

8 Second, water-level drawdown of wells may not exceed permit limits. This
9 regulatory constraint may reduce the amount of pumpage that can be realized from a well
10 or wellfield to less than the permitted pumpage quantities. Given that the water levels of
11 these wells are checked on a weekly basis and that water levels can vary significantly due
12 to small variations in pumpage or changes in precipitation, it is important that some
13 “margin of safety” be maintained between measured drawdown levels and levels
14 permitted by allocation permit.

15 Third, the Company must assure the long-term ability of wellfields to maintain
16 pumpage. The quality of the water pumped from a well or wellfield may also necessitate
17 reduced production. Specific constraints on individual wellfields are explained later in
18 my testimony.

19 Finally, we can only pump wells to the extent that we have demand from our
20 customers. Again, it is necessary that we purchase the minimum quantities of water not
21 only to meet contractual obligations, but to prudently manage our self-supply. Pumpage
22 from our wellfields is, therefore, used to make up the difference between these quantities
23 and actual system demand.

1 **Q. Please explain the pumpage constraints and considerations for AWC's wellfields**
2 **shown in CTD Exhibit 14.**

3 **A. Those constraints are explained in CTD Exhibit 15.**

4 **Q. Will the Company rely on other sources of supply to meet demand over the Test**
5 **Period?**

6 **A. Yes, as reflected in CTD Exhibit 16, AWC will supplement its self-supply by purchasing**
7 **3.19 MGD, including approximately 3.00 MGD of water from the Chester Water**
8 **Authority (CWA) pursuant to a contract that requires minimum annual purchases of that**
9 **amount, and approximately 0.19 MGD of water from the City of Wilmington at the Taft**
10 **& Cleveland interconnection for purposes of maintaining water quality in that portion of**
11 **the system.**

12 **F. Projection of Customer Delivery**

13 **Q. How will AWC meet total system delivery needs for the Test Period?**

14 **A. AWC's system delivery need is summarized in CTD Exhibit 16. As reflected in CTD**
15 **Exhibit 16, the total system delivery in excess of self-supply is made up by slightly**
16 **greater than required minimum interconnection purchases. For the twelve-month period**
17 **ending September 30, 2014, total system delivery is anticipated to be 7.513 MG, with**
18 **6.347 MG supplied from the Company's wellfields (about 84% of total system delivery)**
19 **and 1.166 MG supplied through interconnections (about 16% of total system delivery).**

20 **Q. What is the annual normalized pro forma system delivery need projected for the**
21 **Test Period?**

22 **A. The annual pro forma system delivery projected for the Test Period is presented in CTD**
23 **Exhibit 17. On a pro forma basis, total system delivery for the Test Period is 7.546 MG,**

1 with 6.382 MG supplied from the Company's wellfields (approximately 84% of total)
2 and 1.164 MG supplied through interconnections approximately 16% of total).

3 **Q. Describe AWC's use of these wellfields during the Test Year.**

4 A. Monthly production for the test year, January through December 2013, from each of
5 these wellfields is summarized in **CTD Exhibit 13**. Production for each wellfield is
6 presented in million gallons pumped for each month. Wellfield production is then
7 summed to produce the total self-supply.

8 **Q. What is the total capacity of the New Castle County wellfields?**

9 A. In June 2012, the Company filed a certification with the Water Supply Coordinating
10 Council that AWC has sufficient sources of water to provide adequate supply to meet the
11 projected demand in northern New Castle County through 2015, without relying upon
12 out-of-state suppliers, except for minimum purchase obligations under purchase water
13 contracts in existence on April 1, 2003. The Company's wellfields in northern New
14 Castle County result in a self-supply capacity in 2012 of 23.73 MGD from production
15 wells and 1.42 MGD from ASR, and a total system supply capacity of 28.85 MGD with
16 interconnections. Given the Company's total current supply, capacity is adequate to meet
17 customer demands through the Test Period and into the foreseeable future.

18 In addition, the Company's wellfields in southern New Castle County had an
19 average delivery of 1.4 MGD in 2013 and a peak supply capacity of 6.46 MGD, which is
20 adequate to meet customer demands through the Test Period.

21 **Q. Please describe the anticipated use of the Kent County wellfields during the Test**
22 **Period.**

1 A. Projected wellfield production for the Kent County wellfields during the Test Period is
2 expected to be about 178 MG, or about 0.49 MGD

3 **Q. Please describe the anticipated use of the Sussex County wellfields during the Test**
4 **Period.**

5 A. Projected wellfield production for the Sussex County wellfields during the Test Period is
6 expected to be about 310 MG, for an average of about 0.85 MGD with demands during
7 the summer weekend days over 2.1 MGD.

8 **V. NON-REVENUE GENERATING PROJECTS**

9 **Q. Is AWC requesting any recovery for capital expenditures attributable to non-**
10 **revenue generating projects in this proceeding?**

11 A. Yes. There are three primary categories of non-revenue generating projects for which the
12 Company is requesting recovery. The first category consists of water system upgrades
13 that are being performed to improve system water quality and supply reliability
14 (including hydraulic improvements; new and upgraded treatment facilities; creating,
15 redeveloping, and replacing wells; and pump replacements). AWC has invested a total of
16 \$2,033,000 in hydraulic improvements, \$5,076,000 in treatment facilities, \$890,000 in
17 wells, and \$339,000 in pump replacements since the end of the last rate case test period
18 (October 1, 2011) through the end of this rate case test year (December 31, 2013). AWC
19 plans to invest an additional \$13,161,000 in this category during the test period of
20 January 1, 2014 through September 30, 2014 The second category consists of
21 transmission and distribution projects in conjunction with projects initiated by State or
22 local government for road and infrastructure improvements. The Company has invested
23 a total of \$1,075,000 in this category since the end of the last rate case test period

1 (October 1, 2011) through the end of this rate case test year (December 31, 2013). AWC
2 plans to invest an additional \$1,024,000 in this category during the test period of January
3 1, 2014 through September 30, 2014. The third category consists of the replacement of
4 mains, hydrants, and services as part of AWC's water main replacement program.
5 Artesian will replace a leaking service under a paved road rather than making a repair
6 which would require removal and restoration of a hard surface. The Company has
7 invested a total of \$6,978,000 in this category since the end of the last rate case test
8 period (October 1, 2011) through the end of this rate case test year (December 31, 2013).
9 AWC plans to invest an additional \$6,389,000 in this category during the test period from
10 January 1, 2014 through September 30, 2014. Specific cost information for the projects
11 to be completed throughout the remainder of the Test Period is set forth in **CTD Exhibit**
12 **18.**

13 A. Non-Revenue Generating Water System Upgrades to Improve
14 Water Quality and System Reliability

15 **Q. Please describe the major non-revenue generating water supply upgrades since the**
16 **last rate case filing in 2011 and also the planned upgrades to be completed by the**
17 **end of the current test period (September 30, 2014).**

18 A. **Glendale and Fairwinds Radium Removal.** In 2011, the radium levels in the well
19 water at these plants exceeded the maximum contaminant level ("MCL") of 5.0 pCi/l..
20 AWC investigated and piloted different treatment options before selecting and installing
21 a co-precipitation treatment option. Radium removal filters and associated
22 appurtenances were installed at Glendale and Fairwinds at a cost of \$2,060,000 and
23 \$2,099,000 respectively.

1 **Well Replacements and Redevelopment.** Wells that were installed in the 1950s and
2 1960s were typically constructed as Kelly wells with precast concrete segments. In 2011,
3 one of these wells, Castle Hills #3, failed and it was determined that wells constructed in
4 this manner have a high probability of failing after 40 years. AWC has identified all of
5 the Kelly wells in its system and has implemented a replacement plan to replace these
6 wells before they fail. Since the last rate case, Castle Hills Well #3 and Jefferson Farms
7 Well #1 were replaced with higher efficiency wells. Llangollen Well G-3, Jefferson
8 Farms Well #2, and Fairwinds Well #6 will be replaced and put into service during the
9 test period in 2014 at an estimated cost of \$819,218. Over the next five years, the
10 Company plans to replace the remaining eight Kelly wells. In addition to replacing Kelly
11 wells, AWC monitors the performance of its production wells to ensure they are
12 operating at capacity. When well performance declines, AWC conducts a pump test to
13 determine if the pump or the well is operating under capacity. If the well is identified as
14 operating under capacity, typically from iron build-up on the casing or screen, the well is
15 redeveloped using a combination of chemical and mechanical treatments. The Eastern
16 States wells were redeveloped last year. The Choptank wells will be redeveloped and
17 placed into service during the test period in 2014. The Company has invested a total of
18 \$890,000 in well replacement and redevelopment since the end of the last rate case test
19 period (October 1, 2011) through the end of this rate case test year (December 31, 2013).
20 AWC plans to invest an additional \$1,060,000 during the test period from January 1,
21 2014 through September 30, 2014.

22 **Llangollen Water Treatment Plant (“WTP”) 1,4 Dioxane Removal.** The
23 concentration of 1,4 dioxane in two of the four wells in the Llangollen wellfield has

1 increased to a level of concern based upon Delaware's Office of Drinking Water' advisory
2 level of 3.5 parts per billion. AWC requested a proposal from Hatch Mott McDonald, a
3 respected consultant in this type of treatment, and investigated three Advanced Oxidation
4 Processes for the removal of 1, 4- dioxane at the levels detected in the Llangollen Estates
5 Wellfield based on the output for the Llangollen Water Treatment Plant of 2.2 MGD. The
6 new treatment process AWC is installing at Llangollen is known as an ultraviolet
7 advanced oxidation process (UV/AOP). It involves adding hydrogen peroxide (H_2O_2) to
8 the water and then treating with UV light. The three options investigated were: (1)
9 Trojan Low Pressure-High Output UV and Hydrogen Peroxide System; (2) Calgon
10 Medium Pressure UV with Hydrogen Peroxide System; and (3) an Applied Technologies
11 Ozone with Hydrogen Peroxide System. Based on the three options, the Applied
12 Technologies Ozone with Hydrogen Peroxide System was ruled out as the plant is
13 constructed in a residential neighborhood and Artesian wanted to minimize any risk of
14 having an ozone facility near residents. Of the remaining two options, AWC selected the
15 Trojan Low Pressure-High Output UV and Hydrogen Peroxide System as it has a
16 comparable capital cost, lower life-cycle cost, and a lower annual operation and
17 maintenance cost than the Calgon Medium Pressure UV and Hydrogen Peroxide System.
18 The new equipment is being installed in a separate building located near the existing
19 treatment building. The ongoing major operational expenses will be electricity,
20 replacement bulbs for the UV reactors, hydrogen peroxide, and manpower. The total
21 capital cost of this project is estimated at \$3,902,000 and the facility is scheduled to be in
22 service by September 30, 2014.

23

1 **Route 273 to Christiana Mall.** This project is approximately 4,300-feet of 16-inch
2 ductile iron pipe and 1,200-feet of high density polyethylene. This project will improve
3 reliability and provide a second water feed into the Christiana Mall, which is currently
4 fed with a single 16-inch water main. The estimated cost of this project is \$1,350,000, of
5 which AWC expects a contribution of \$874,026 from three new customers. The project
6 will be complete by September 30, 2014.

7 **Christiana Mall to Continental Drive.** This project is approximately 4,300-feet of
8 16-inch ductile iron pipe and 700-feet of high density polyethylene. By adding the Route
9 273 to the Christiana Mall project, along with this project into the water distribution
10 system, reliability will improve by providing another feed from Service Level 1 to
11 Service Level 2. The estimated cost of this project is \$1,100,000. The project will be
12 complete by September 30, 2014.

13 **Christiana Booster Station.** The Christiana Booster station has been constructed to
14 provide a more reliable supply of water to the Christiana Hospital, Christiana Mall
15 Expansion Area, DelTech, JPMorgan Bank and other businesses in the area. It will
16 provide a third crossing of I-95 to better ensure reliability in the event of a failure at one
17 of the other I-95 crossings. This project will provide redundancy for the existing
18 Churchmans Road Booster Station, which has been in service for over 50 years. While
19 the Churchmans Road Booster Station can pump approximately 5.75 MGD, the recent
20 growth in the Christiana Mall area has created concern that Churchmans Road Booster
21 Station alone is not adequate to provide sufficient supply reliability for the projects under
22 construction in the surrounding area. The Christiana Booster Station is designed to flow
23 approximately 5.18 MGD with two pumps each capable of 1,800 gpm and one spare

1 pump capable of a flow of 1,800 gpm for redundancy. The size of the booster station was
2 established to ensure the continued flow of water in this portion of New Castle County in
3 the event the Churchmans Road Booster Station is out of service. A redundant feed of a
4 16-inch main and the Christiana Booster station will provide additional water that would
5 essentially provide a quantity of water equal to that of the Churchmans Road Booster
6 Station. The total cost of this project is estimated at \$1,878,000 and is scheduled to be in
7 service by September 30, 2014.

8 **Bayberry South to Commodore Estates II.** This project is approximately 3,000-feet of
9 12-inch PVC and ductile iron pipe. This project will connect the stand-alone
10 Commodore Estates II water distribution system to AWC's Main System south of the
11 Canal. This project will improve water service reliability and enable fire protection to the
12 Commodore Estates subdivision. This project is estimated to cost approximately
13 \$210,000 and will be complete by September 30, 2014.

14 **Castle Hills Clearwell and Plant Upgrades.** In October 2012, an inspection revealed
15 that the structural concrete floor of this 1950s era facility was in poor condition. The
16 reinforcing steel was corroding and the concrete was cracking and spalling. In order to
17 replace the concrete floor, all of the equipment had to be removed. An analysis
18 determined that the equipment was at the end of its useful life and was in need of
19 replacement. The proposed plant includes a new lime slurry system, aluminum aerator,
20 separate chemical rooms, separate electrical rooms, and new booster pumps. The station
21 also had to undergo electrical and mechanical rehabilitations. These upgrades provide
22 increased station safety for operators and chemical delivery personnel. This project has
23 an estimated cost of \$1,164,000 and is expected to be completed by May 2014.

1 **Choptank Wells #2 and #3 Redevelopment.** The Choptank wellfield was operating
2 below its capacity so Engineering performed a specific capacity analysis on the existing
3 wells and determined that Wells #2 and #3 were both in need of redevelopment and new
4 pumping equipment. The specific capacities of the wells had dropped and the pumps
5 were failing. The well redevelopment and pump upgrades will increase the efficiency and
6 reliability of the station. The total cost of this project is estimated at \$131,000 and is
7 scheduled to be back in service by April 2014.

8 **Fairwinds #6 Kelly Well Replacement.** This is a Kelly well that was put into service in
9 1967. This Fairwinds well has exceeded its 40-year life estimate and is in need of
10 replacement before failure. The new well will be drilled using reverse-rotary drilling,
11 which should increase the efficiency of the well. This project is estimated to cost
12 \$200,000 and is scheduled to be in service by August 2014.

13 **Automation and Controls.** The Bayview, Midvale, and Roseville Park Booster Station
14 facilities will be added to the corporate Supervisory Controls and Data Acquisition
15 (“SCADA”) system. The Company has standardized on SCADA instrumentation at all
16 its water treatment facilities so they can be controlled remotely and send alarms to our
17 dispatcher for emergency response. The SCADA software will also record and save
18 important trending data that allows the Engineering and Operations Departments to
19 analyze the status of the facility and distribution system so that future planning and more
20 efficient changes can be made. The total cost of these projects is estimated at \$130,000
21 and scheduled to be in service by July 2014.

22 **Station Generators.** Generators are being added at the Beaver Creek, Llangollen, and
23 Augustine Creek water treatment plants. Generators will allow treatment plants to

1 remain operational in the event of a power outage or other major natural catastrophe.
2 Generators are sized for critical facilities to serve as back-up power for emergency
3 response. These projects have an estimated cost of \$235,000 and are expected to be in
4 service by September 30, 2014.

5 **B. Non-Revenue Generating Transmission and Distribution**
6 **Projects Initiated by State or Local Government**

7 **Q. Please describe the major non-revenue generating transmission and distribution**
8 **(“T&D”) projects initiated by state or local government since the last rate case filing**
9 **in 2011, as well as any planned T&D projects to be completed by the end of the**
10 **current test period (September 30, 2014).**

11 **A.** There were several major projects that were completed between 2011 and this rate filing.
12 These projects include SR 7 from Newtown Road to SR 273, DRBA Airport Taxiway
13 Expansion, US 301-MD Line to Levels Road, US 301 Armstrong Corner Road, and BR
14 1-366 Chesapeake City Road. These mains were located within DelDOT rights-of-way
15 and were required to be relocated since there were conflicts with road projects. The total
16 cost for all projects since the last rate filing was \$1,075,000. Projects anticipated to be
17 completed during the current test period are as follows:

18 **Howell School Road, SR 896 to SR 71 Advance Utility Relocation.** AWC is replacing
19 approximately 900 feet of 16-inch and 400-feet of 12-inch ductile iron pipe with 1,800
20 feet of 20-inch ductile iron pipe at the intersection of Denny Road and SR 896 in
21 Newark, Delaware. This relocation work constitutes advanced utility relocations for
22 DelDOT’s proposed Howell School Road realignment project and incorporates a larger
23 diameter pipe that will become a critical segment of a future hydraulic improvement

1 initiative. This phase of the project has an estimated cost of \$486,000 and is anticipated
2 to be completed by September of 2014.

3 **US 301 Bypass, Levels Road to Summit Bridge Road.** AWC is replacing
4 approximately 1,700 feet of 12-inch ductile iron water main along Bunker Hill Road in
5 Middletown, Delaware. This relocation work constitutes advanced utility relocations at a
6 future bridge location on Contract 2A of the proposed US 301 Mainline Project and is
7 100% reimbursable by the State. The project has a total estimated cost of \$377,000.00
8 and is anticipated to be completed by August of 2014.

9 **C. Non-Revenue Generating Main Replacement Program**

10 **Q. Does AWC have a Main Replacement Program?**

11 A. In an effort to avoid infrastructure problems and ensure both superior service and a
12 reliable supply of quality water for our customers, the Company has implemented a major
13 water main replacement program that focuses on those areas with some of the worst
14 history of main breaks and failures. Under the program, AWC is replacing old asbestos
15 cement (AC) pipe, galvanized steel (GALV) pipe, and unlined cast iron (CI) pipe. The
16 main replacement program has a two-fold purpose: 1) to reduce the frequency of main
17 breaks, thereby reducing transmission and distribution repair costs, lost water expense
18 (unaccounted for water), and the frequency of customer outages; and 2) to improve water
19 service, including improved water quality to our customers. Since this program
20 commenced in 1994, AWC has seen water main breaks drop from 199 in 1993 to an
21 average of 108 over the last five years, or by 45%. This reduction in main breaks has
22 resulted in less water lost from the system. Unaccounted water has been, on the average,
23 about 10 percent of production over the last 10 years. The American Water Works
24 Association (“AWWA”) recommends that utilities establish a goal of unaccounted for

1 water of less than 10 percent. Since 1996, Artesian has replaced 104,247 linear feet of
2 AC pipe, 61,018 linear feet of GALV pipe, and 70,300 linear feet of CI pipe.

3 **Q. What type of material does AWC use in its water main replacement program and**
4 **why?**

5 A. Except in the severe coastal environment where exposure to the high water table,
6 corrosive soils, and salt are not conducive to the use of iron pipe, AWC typically uses
7 ductile iron pipe (DIP) for main replacements. This is the highest quality pipe material
8 with a long history of successful use. The Company believes that replacement of older,
9 inferior materials with ductile iron will continue to reduce the number of main breaks and
10 the interruption of service and water quality problems that accompany them.

11 **Q. Please describe the major main replacement projects since the last rate case filing in**
12 **2011, as well as any planned main replacement projects to be completed by the end**
13 **of the current test period (September 30, 2014).**

14 A. There were several major projects that were completed between 2011 and this rate filing.
15 These projects included work at Newport Heights, Limestone Road, Linden Green,
16 Centerville Road, Erickson Drive, Llangollen Estates, East Minquadale, Klair Estates,
17 Old Harmony Road, Duross Heights, Meadow Road, Swanwyck Estates, and Heritage
18 Park. The total cost for all projects since the last rate filing was \$6,978,000. Main
19 replacement projects anticipated to be completed during the current test period are as
20 follows:

21 **Collins Park.** The Company will install 8-inch ductile iron pipe (DIP), 6-inch DIP water
22 main, three fire hydrants, and 102 water services. This will replace 6-inch asbestos

1 cement (AC) pipe. This project is scheduled for completion in June 2014 at an estimated
2 cost of \$786,000.

3 **Swanwyck Estates.** The Company will install 8-inch ductile iron pipe (DIP), three fire
4 hydrants and four water services. This will replace 8-inch asbestos cement (AC) pipe.
5 This project is scheduled for completion in April 2014 at an estimated cost of \$275,000.

6 **Brookmeade I.** The Company will install 8-inch ductile iron pipe (DIP), 2-inch
7 polyethylene (PE), two fire hydrants and 46 water services. This will replace 6-inch cast
8 iron pipe (CI). This project is scheduled for completion in May 2014 at an estimated cost
9 of \$461,000.

10 **Richardson Park.** The Company will install 8-inch ductile iron pipe (DIP), 4-inch
11 ductile iron pipe, four fire hydrants and 70 water services. This will replace 6-inch cast
12 iron pipe (CI), 4-inch CI and 2-inch galvanized steel pipe (GALV). This project is
13 scheduled for completion in June 2014 at an estimated cost of \$806,000.

14 **East Minquadale.** The Company will install 8-inch ductile iron pipe (DIP), 4-inch DIP,
15 two fire hydrants, and 40 water services. This will replace 2-inch galvanized steel pipe
16 (GALV). This project is scheduled for completion in August 2014 at an estimated cost of
17 \$400,000.

18 **Del Park Manor.** The Company will install 8-inch ductile iron pipe (DIP), four fire
19 hydrants and 71 water services. This will replace 8-inch asbestos cement (AC) pipe and
20 6-inch AC pipe. This project is scheduled for completion in August 2014 at an estimated
21 cost of \$717,000.

1 **Bowlerama.** The Company will install 8-inch ductile iron pipe (DIP), two fire hydrants,
2 and nine water services. This will replace 8-inch cast iron pipe (CI). This project is
3 scheduled for completion in August 2014 at an estimated cost of \$435,000.

4 **Newport Gap Pike.** The Company will install 8-inch ductile iron pipe (DIP), 2-inch
5 polyethylene (PE), two fire hydrants, and 22 water services. This will replace 8-inch cast
6 iron pipe (CI), 8-inch asbestos cement (AC) pipe, and 2-inch galvanized steel pipe
7 (GALV). This project is scheduled for completion in August 2014 at an estimated cost of
8 \$337,000.

9 **Vilone Village.** The Company will install 8-inch ductile iron pipe (DIP), 6-inch DIP,
10 4-inch DIP, 2-inch polyethylene (PE), six fire hydrants, and 102 water services. This will
11 replace 8-inch asbestos cement (AC) pipe, 6-inch AC pipe, and 2-inch galvanized pipe
12 (GALV). This project is scheduled for completion in February 2014 at an estimated cost
13 of \$899,000.

14 **Manette Heights.** The Company will clean and line 3,000 linear feet of 6-inch and
15 4-inch cast iron (CI) pipe. The process will clean the existing CI pipe and line it with a
16 layer of cement. Lining the water mains was chosen over replacement because there is
17 no break history in this development. Cleaning and lining water main is only used when
18 there is a water quality issue. The quality issue causes high iron in the water mains,
19 which require frequent trips for our Water Quality Technician to rectify the problem.
20 The project is scheduled for completion by August 2014 at an estimated cost of \$225,000.

21 **Sheffield Manor Bridge Crossing Renewal.** The Company will install 12-inch high
22 density polyethylene pipe (HDPE) to replace approximately 160 linear feet of 6-inch steel
23 water main that is currently hanging on the bridge between Creekside and Sheffield

1 Manor. The project is scheduled for completion by August 2014 at an estimated cost of
2 \$200,000.

3 **VI. REVENUE GENERATING PROJECTS**

4 **Q. Please describe the major expenditures included in the Company's filing for**
5 **revenue generating projects.**

6 **A. Ingram Village Well and Interim Treatment Plant.** Ingram Village is a 400-lot
7 subdivision located along the northern boundary of the Town of Ellendale, Delaware.
8 The first two homes were provided water service using a residential well. An interim
9 facility consisting of a treatment shed to add sodium hydroxide, sodium hypochlorite, and
10 a corrosion inhibitor will be constructed. The source of supply is an
11 8-inch production well with a 95 gpm well pump. Storage will be provided with one (1)
12 5,000 gallon hydropneumatic tank. This project is expected to be online in March 2014
13 at an estimated cost of \$212,000.

14 **Q. Does this conclude your testimony at this time?**

15 **A. Yes, it does.**

ENGINEERING CONSIDERATIONS INVOLVED IN WATER SYSTEM DESIGN

I. OVERVIEW

There are five factors that any engineer must consider in designing water systems: (1) capacity; (2) complexity; (3) safety; (4) reliability; and (5) cost. This Exhibit discusses these five design factors in general terms and then seeks to address their applicability to design decisions made by Artesian Water Company, Inc. (“Artesian” or the “Company”) in the four component areas of a water system: (1) source of supply; (2) treatment; (3) storage; and (4) distribution.

II. THE FIVE FACTORS

1. Capacity

Assessing the “capacity” of any given solution refers to assessing that solution’s ability to supply the quantity and quality of water to meet current and future needs. Thus, assessing “capacity” is a two-fold consideration. First, it requires making sure that there is an adequate margin for error so that if the solution is not performing as expected, or there is a greater demand than expected, that solution can still easily satisfy the actual need in the face of those unexpected changes in circumstances without working the solution or system to its limits or beyond the intended use of the equipment. This analysis must also be conducted with respect to the anticipated future demand for water. Hence, the solution not only needs to satisfy current demand with an added margin for error, it also needs to be capable of meeting greater future demand; again, with an added margin for error.

2. Complexity

Assessing the level of “complexity” of any given solution recognizes the fact that the more complex a solution is, or the more “bells and whistles” the solution has, the greater the likelihood that the solution could fail due to the failure of any one of those bells or whistles. For that reason, as a general rule, the less complex the solution, the better.

3. Safety

Assessing “safety” requires taking into account the potential for any user, whether a worker or a customer, to have an accident or be exposed to an unsafe condition. No engineer wants to design or construct a system that puts a user at risk of injury.

4. Reliability

Assessing a solution’s “reliability” involves measuring the solution’s chances of failure. With respect to any engineered system associated with public health and safety, failure is just not an option.

5. Costs

For any given alternative solution that passes the above-mentioned “tests,” the costs associated with that solution must be evaluated. Those costs include the initial capital outlay, operating costs, and the anticipated frequency of the need to replace associated equipment over time. For example, a well-designed, highly-efficient motor might cost several hundred dollars more than an average, off-the-shelf motor, but the lower costs associated with operating the more expensive motor over time as compared to the average, off-the-shelf motor might justify its purchase, even at the higher price. Similarly, a submersible pump might cost \$2,000 to \$3,000 whereas the alternative, to install a line shaft turbine pump, might cost \$10,000

to \$15,000. However, the submersible pump might have a life expectancy of three to five years, whereas the line shaft turbine pump might have a life expectancy of 20 years. So, again, the initially more expensive solution may actually prove to be more cost-effective over time, saving dollars over the course of its life cycle.

III. APPLICATION OF THE FIVE FACTORS TO THE FOUR BASIC COMPONENTS OF A WATER SYSTEM

1. Source of Supply

When Artesian seeks to serve a new customer, we must ensure that we have an adequate supply of water. In the case where the Company cannot simply extend a water main to reach that customer, we drill a test well to determine what quantity and quality of water is available. Artesian's goal is to drill to deeper aquifers to avoid potential conflict with existing users and possible contamination from surface sources such as septic systems, agricultural fertilizers, and pesticides. We also try to avoid iron contamination. We conduct a pump test to identify what the aquifer will yield and what its quality is. Once we determine that the test well is viable, we apply for a permit to convert that well into a public-supply well.

In terms of reliability, we aim to have multiple sources of supply for back-up purposes. For example, Artesian likes to have access to two wells for a single water system or, if not two wells, at least an additional pump in inventory that could readily be used to replace a failing one.

2. Treatment

We use the data we collect from the pump test to assess what treatment to the water is necessary. There are currently over 130 contaminants that are regulated by the

Delaware Division of Public Health under the Federal Safe Drinking Water Act. If we are fortunate, the water will be of high quality and will only require pH adjustment, corrosion control, disinfection, and fluoridation. If iron or manganese is present, we install removal facilities, which is a more expensive proposition. This additional treatment typically involves oxidation of iron and/or manganese using chlorine and filtration. Alternatively, ion exchange technology may also be used to remove iron. In situations where naturally occurring organics may be present, an alternative oxidizing agent, such as potassium permanganate or ozone, may be required.

As with supply, we like to have at least two, rather than just one, treatment units in place as back-up in the event one fails. In terms of costs, when the relatively fewer number of users dictates that it is more cost-effective, we prefer to use less expensive portable treatment units in place of more permanent facilities. For example, a portable treatment unit can support about 35 residential homes. Once the number of customers increases beyond 35, an additional portable unit or construction of the initial phase of what would become a permanent treatment pumping station could be warranted.

3. Storage

Storage has a number of benefits to the water system as a whole. First, it is used to maintain water pressure throughout the distribution system. Second, it is used to maintain supply during periods of peak demand. Finally, and most importantly, in cases of larger water systems, which are component parts of the Company's overall system, storage provides the added water needed for fire protection.

The storage concerns are somewhat different for larger water systems as compared to smaller ones, though both are parts making the whole of Artesian's system. With

larger systems, there are basically two storage options available, the first being elevated storage and the second being ground storage with pumping. Significant storage of one of these two types is required when a water system has at least 50 customers or reaches build-out and requires fire protection. As a general rule, we believe that elevated storage is by far the preferable means of storage. This is because elevated storage also provides pressure. Sized appropriately, elevated storage is virtually a guaranteed means for meeting both peak demand throughout the course of a day and fire protection needs. Therefore, in the event all electrical and mechanical systems fail during an emergency, gravity continues to supply water to our customers. The alternative means – ground storage with pumping – is simply a tank that is built at grade or below grade level, along with an associated booster pumping station. The booster pumping station would have to have the capability of meeting a full range of water demand levels, from very low demands to peak-day demands, all the while maintaining a minimum capacity in reserve to meet fire flow requirements. Thus, the system must be able to adjust the supply to the system to match the demand on the system. Additionally, all electrical and mechanical systems must be in working order for ground storage with pumping to work. It is a much more complex operation in comparison to elevated storage, and, as such, prone to be less reliable than elevated storage.

With smaller water systems, we typically use hydropneumatic tanks. This is a tank that is partially filled with air and is used to balance the flow of water from the well and treatment system with the actual demands on the system. As water is used by customers, the air expands and the pressure will drop. Once the pressure drops to a certain level, a switch will trigger the pump to turn on. The pump then pumps water into the tank to restore what was lost. As the air compresses, the pressure increases, and when it reaches a predetermined point, the

pump automatically shuts off. This cycle repeats itself through the course of the day. Thus, the purpose of the hydropneumatic tank is to balance the water pumping rate with water use.

Determining what form of storage to use is a product of many factors. The level of demand is critical. We cannot use an elevated tank where there is too little demand. It is expensive and quality problems tend to develop due to the quantity of water in storage. Therefore, in a smaller water system, it is preferable to use hydropneumatic tanks.

As for choosing between elevated storage and ground storage with pumping for larger water systems, we consider whether an elevated storage tank is available, and assuming it is, the cost of building such a tank relative to a ground storage tank with its associated pumping station. Typically, a ground storage tank and booster station will have a slightly lower initial capital cost than an elevated tank. Comparing ongoing operational and maintenance expenses over the life of those facilities, however, with those of elevated storage shows an elevated tank having a significantly lower life cycle cost. Of course, if property cannot be acquired where an elevated tank is allowed, ground storage would be used. Also, where the design of a permanent station would allow for the use of a ground storage tank and booster station in its design, they might be used as an interim measure until an elevated tank could be constructed.

4. Distribution

The distribution system includes the pipes that transport water from the sources of supply, treatment, and storage to the customer. We need to ensure that there is adequate pressure and flow throughout our pipes to meet the water needs of our customers. Typically, if fire protection standards are met, then customer needs are also met because fire protection flow requirements significantly exceed the flow necessary for customer water use. One very important factor in the sizing of a water distribution system is the need to ensure that future

needs in the area can be met by the water main. In most instances, water mains are laid within highway rights-of-way, where there is considerable competition for the available space among all utilities (e.g., gas, sewer, telephone, and cable television). It is extremely difficult to go back at some future date to install a larger or parallel water main to increase capacity. In those instances where it may be possible to install replacement mains, costs are typically prohibitive due to the need to install such mains under paved roadways, thereby necessitating the replacement of half of the road pavement.

MAPS

SEE ORIGINALS
IN DOCKET

Artesian Water Company
New Castle County Booster Stations and Pressure Reducing Valves

| LOCATION | FACILITY TYPE | SERVICE LEVELS (from / to) | CAPACITY (MGD) | COMMENT |
|--------------------------|-------------------------------|----------------------------|----------------|---|
| Eastern States | Booster | 1 to 1A | 3 | |
| Churchmans Booster | Booster | 1 to 2 | 3 | |
| Newport Heights | Booster | 1 to 2 | 2 | |
| Carousel Park | Booster | 2 to 3PC | 3 | |
| Roseville Park | Booster | 2 to 3PC | 1 | |
| Tybrook | Booster | 2 to 3LP | 1.2 | |
| Pike Creek | Booster | 3PC to 4 | 1.5 | |
| Stenning Woods | Booster | 4 to 5PM | 1 | |
| Penn Manor | Booster | 4 to 5PM | 1 | Emergency back-up for when Chester is out of service |
| Stenning Woods | Booster | 4 to 5PM | 1 | Emergency back-up for when Chester is out of service. |
| Old Wilmington Road | Booster | 4 to 5OWR | 1.7 | |
| Chesapeake City Road | Pressure Reducing Valve (PRV) | 10 to 1 | n/a | |
| Roseville Park | PRV | 3PC to 2 | n/a | |
| Tybrook | PRV | 3SP to 2 | n/a | |
| Cooper Farms | PRV | 3SP to 2 | n/a | |
| Ochletree Lane | PRV | 4 to 3PC | n/a | |
| Pike Creek Road | PRV | 4 to 3PC | n/a | |
| Polly Drummond Hill Road | PRV | 4 to 3PC | n/a | |
| Westminster | PRV | 4 to 3SP | n/a | |
| Duncan Road | PRV | 4 to 3SP | n/a | |
| McKennans Church Rd | PRV | 4 to 3SP | n/a | |
| Limestone Road | PRV | 3PC to 3SP | n/a | |
| Tybrook | PRV | 3LP to 3SP | n/a | |
| Lancaster Pike | PRV | 4 to 3LP | n/a | |
| Stenning Woods | PRV | 5PM to 4 | n/a | |
| Valley Road | PRV | 5PM to 4 | n/a | |

Artesian Water Company
New Castle County Main System Well Fields

| WELLFIELD | SERVICE LEVEL | NUMBER OF WELLS | DNREC WELLFIELD ALLOCATION ANNUAL AVG DAY (MGD)* |
|--------------------------------------|---------------|-----------------|--|
| Chesapeake City Road/Brennan | 1 | 6 | 3.88 |
| Old County Road | 1 | 2 | 2.00 |
| Eastern States | 1 | 2 | 1.01 |
| Caravel Farms | 1 | 1 | 0.29 |
| Glendale | 1 | 5 | 1.80 |
| Artisans Village | 1 | 4 | 3.02 |
| Llangollen Estates | 1 | 5 | 2.00 |
| Fairwinds | 1 | 5 | 2.00 |
| Midvale | 1 | 2 | 0.58 |
| Airport Industrial Park | 1 | 2 | 0.72 |
| Wilmington Manor Gardens (#1 and #3) | 1 | 2 | 0.78 |
| Jefferson Farms | 1 | 2 | 1.30 |
| Greater Wilmington Airport | 1 | 3 | 0.86 |
| Castle Hills | 1 | 4 | 1.39 |
| Collins Park | 1 | 1 | 0.58 |
| Hockessin | 4 | 6 | 1.93 |
| Middle Run | 3PC | 2 | 1.10 |
| Levels | 10 | 2 | Less than 50,000 (see note) |
| Willow Grove | 10 | 3 | 0.79 |
| Chestnut Grove | 10 | 1 | 0.65 |
| Hyetts | 10 | 1 | Less than 50,000 (see note) |
| Choptank | 10 | 3 | 2.38 |
| Bethel Church | 10 | 2 | 1.00 |
| Townsend (#1 and #2) | 10 | 2 | 0.50 |
| Stonefield | 10 | 1 | 0.58 |
| Thomas Cove | 10 | 2 | 0.29 |

*Refer to Exhibit 14 for the DNREC Wellfield Allocation Limitations.

Note: Water allocation permits are required for all water withdrawals greater than 50,000 gallons in any 24 hour period. Water withdrawals of 50,000 gallons or less in 24 hours are granted with the permits to construct the water facilities with which the withdrawals are made.

Artesian Water Company
New Castle County Interconnections

| INTERCONNECTION | DIRECTION | WATER AUTHORITY | AVG. DAY CAPACITY (MGD) | PEAK MONTH CAPACITY (MGD) |
|-------------------------|-----------|-------------------------|-------------------------|---------------------------|
| Chester Water Authority | 2-WAY | Chester Water Authority | 3.0 | 6.0 |
| School Lane | 2-WAY | City of New Castle | 0.5 | 0.7 |
| Lukens Drive* | 1-WAY | City of New Castle | ---- | ---- |
| Polly Drummond Hill Rd* | 2-WAY | City of Newark | 0.4 | 0.4 |
| Moorehouse Lane* | 2-WAY | City of Wilmington | ---- | ---- |
| South Heald Street* | 2-WAY | City of Wilmington | 1.0 | 1.5 |
| Maryland Avenue* | 1-WAY | City of Wilmington | 3.0 | 5.0 |
| Taft and Cleveland | 1-WAY | City of Wilmington | 0.5 | 0.7 |
| Red Lion Road* | 2-WAY | United Water | ---- | ---- |
| First State Blvd* | 2-WAY | United Water | 1.0 | 0.0 |
| Pleasant Valley* | 2-WAY | United Water | 0.7 | 0.0 |
| Newport Heights* | 1-WAY | United Water | 2.0 | 0.0 |
| Churchmans Road* | 2-WAY | United Water | 1.0 | 0.0 |
| Industrial Drive | 2-WAY | Town of Middletown | 1.4 | 1.4 |
| Route 299 | 2-WAY | Town of Middletown | 1.4 | 1.4 |
| Route 301/71 | 2-WAY | Town of Middletown | 1.4 | 1.4 |
| Bunker Hill Road | 2-WAY | Town of Middletown | 1.4 | 1.4 |
| Green Giant Road | 1-WAY | Town of Middletown | 1.0 | 1.4 |

Artesian Water Company
 New Castle County Water Treatment Facilities

| FACILITY | CHLORINE, PHOSPATE, FLUORIDE | pH ADJUST- MENT | AERATION | ADDITIONAL TREATMENT | PURPOSE |
|--------------------------------|------------------------------------|-----------------------|----------|--|----------------|
| Airport Industrial Park | CPF | NaOH | --- | Carbon Contactors | PCE/TCE |
| Artisans Village | CPF | Lime | Yes | | |
| Augustine Creek | CP | NaOH | --- | Filtration** | Iron Removal |
| Bayview* | CP | --- | --- | Filtration | Iron Removal |
| Bethel Church | CP | NaOH | --- | Filtration | Iron Removal |
| Caravel Farms | CPF | NaOH | --- | | |
| Castle Hills* | CPF | Lime | Yes | | |
| Chesapeake City Road* | CPF | NaOH | --- | Filtration** | Iron Removal |
| Chestnut Grove | CP | NaOH | --- | Filtration | Iron Removal |
| Choptank* | CPF | NaOH | --- | Filtration** | Iron Removal |
| Collins Park | CPF | Lime | --- | Carbon Contactors & Air Stripper | PCE/TCE/BCEE |
| Commodore Estates* | CP | --- | --- | Filtration | Iron Removal |
| DCC | C | --- | --- | | |
| Eastern States* | CPF | Lime | Yes | | |
| Fairwinds | CPF | Lime | Yes | Filtration | Radium Removal |
| Glendale | CPF | Lime | Yes | Filtration | Radium Removal |
| Greater Wilmington Airport* | CPF | --- | Yes | Filtration | Iron Removal |
| Hockessin* | CPF | --- | --- | Carbon Contactors | PCE |
| Hyetts | CP | NaOH | --- | Filtration | Iron Removal |
| Jefferson Farms | CPF | Lime | Yes | | |
| Levels | CPF | NaOH | --- | Filtration | Iron Removal |
| Llangollen Estates | CPF | Lime | Yes | Carbon Contactors & Air Stripper | PCE/TCE/BCEE |
| Middle Run | CPF | --- | --- | | |

Artesian Water Company
 New Castle County Water Treatment Facilities

| FACILITY | CHLORINE, PHOSPATE, FLUORIDE | pH ADJUST- MENT | AERATION | ADDITIONAL TREATMENT | PURPOSE |
|--------------------------------|------------------------------------|-----------------------|----------|-------------------------|--------------|
| Midvale | CPF | Lime | Yes | | |
| Odessa Woods* | CP | --- | --- | | |
| Old County Road* | CPF | Lime | Yes | Filtration** | Iron Removal |
| Stonefield* | CPF | NaOH | --- | Filtration** | Iron Removal |
| Thomas Cove* | CPF | --- | --- | Filtration** | Iron Removal |
| Townsend #1* | CPF | --- | --- | Filtration** | Iron Removal |
| Townsend #2* | CPF | --- | --- | Filtration** | Iron Removal |
| Willow Grove* | CPF | --- | --- | Filtration** | Iron Removal |
| Wilmington Manor Gardens #1 | CPF | NaOH | --- | | |
| Wilmington Manor Gardens #3 | CPF | NaOH | --- | | |

*Backup power provided

**Potassium Permanganate added

Artesian Water Company
New Castle County Storage Tanks

| LOCATION | SYSTEM | SERVICE LEVEL | TYPE OF TANK | TANK CAPACITY (GALLONS) |
|----------------------------|--------|---------------|--------------|-------------------------|
| Bear Tank | Main | 1 | Ground | 5,396,000 |
| Clearview | Main | 1 | Elevated | 600,000 |
| Glasgow Tank | Main | 1 | Elevated | 1,000,000 |
| Red Lion Tank | Main | 1 | Elevated | 2,000,000 |
| School Lane | Main | 1 | Ground | 2,000,000 |
| Tuxedo Park | Main | 2 | Elevated | 1,000,000 |
| Tuxedo Park | Main | 2 | Elevated | 500,000 |
| Willow Run | Main | 2 | Elevated | 1,000,000 |
| Crow Hill | Main | 2 | Elevated | 3,972,000 |
| Cooper Farm | Main | 2 | Elevated | 3,000,000 |
| Cooper Farm | Main | 2 | Elevated | 660,000 |
| Tybrook | Main | 2 | Elevated | 1,184,000 |
| Tybrook | Main | 2 | Elevated | 110,000 |
| Tybrook | Main | 2 | Elevated | 3,000,000 |
| Pike Creek | Main | 3PC | Elevated | 4,000,000 |
| North Star Tank | Main | 4 | Elevated | 200,000 |
| Stenning Woods | Main | 4 | Elevated | 4,000,000 |
| Old Wilmington Road Tank 1 | Main | 4 | Elevated | 1,187,000 |
| Old Wilmington Road Tank 2 | Main | 5OW | Elevated | 150,000 |
| Hyetts | Main | 10 | Elevated | 400,000 |
| Industrial Drive | Main | 10 | Elevated | 1,500,000 |
| Fieldsboro | Main | 10 | Elevated | 1,000,000 |
| Townsend | Main | 10 | Elevated | 150,000 |

Artesian Water Company
New Castle County Stand-Alone Water Systems

| STAND-ALONE WATER SYSTEM | NUMBER OF CUSTOMERS | DISTRIBUTION SYSTEM | NO. OF WELLS | DNREC WELLFIELD ALLOCATION | TREATMENT | STORAGE | BACK-UP POWER |
|------------------------------------|---------------------|--|--------------|----------------------------|---|-----------------------------------|---------------|
| Delaware Correctional Center (DCC) | 4 Master Meters | 15,000 Feet of Water Main and 12 Fire Hydrants | 4 | 2,131,000 gpd | Chlorine | 300,000 Gallon Elevated Storage | Well #3 |
| Bayview | 43 | 1,790 Feet of Water Main | 3 | 430,000 gpd | Chlorine, Phosphate, Iron Removal | Hydro-Pneumatic Tanks | Yes |
| Commodore Estates | 47 | 6,614 Feet of Water Main and 5 Fire Hydrants | 2 | 430,000 gpd | Chlorine, Phosphate, Iron Removal | Hydro-Pneumatic Tanks | Yes |
| Augustine Creek | 203 | 18,938 Feet of Water Main and 20 Fire Hydrants | 3 | 124,000 gpd | Chlorine, Phosphate, Potassium Permanganate, Iron Removal | 88,000 Gallon Ground Storage Tank | Yes |
| Odessa Woods | 12 | 1,440 Feet of Water Main | 2 | Less than 50,000 gpd | Chlorine, Phosphate | Hydro-Pneumatic Tanks | Yes |

Artesian Water Company
Kent County Stand-Alone Water Systems

| STAND-ALONE WATER SYSTEM | NUMBER OF CUSTOMERS | DISTRIBUTION SYSTEM | NO. OF WELLS | DNREC WELLFIELD ALLOCATION | TREATMENT | STORAGE | BACK-UP POWER |
|---|---------------------|--|--------------|----------------------------|--|------------------------------------|---------------|
| Big Oak (Serves Spring Meadows, Twin Willows, and Burtonwood Village) | 498 | 6.5 Miles of Water Main and 30 Fire Hydrants | 2 | 576,000 gpd | Chlorine, Phosphate, Caustic, Fluoride | 190,000 Gallon Ground Storage Tank | Yes |
| Deer Meadows (Also serves Breeders Crown & Southfield) | 113 | 14,323 Feet of Water Main and 15 Fire Hydrants | 2 | Less than 50,000 gpd | Chlorine, Phosphate, Ion Exchange (Iron Removal) | 88,000 Gallon Ground Storage Tank | Yes |
| Weatherstone Crossing (Also serves Fiddlers' Creek & Lynwood Village) | 32 | 19,312 Feet of Water Main and 18 Fire Hydrants | 2 | 864,000 | Chlorine, Phosphate | 80,000 Gallon Clear Well | Yes |
| Paradise Estates | 42 | 9,978 Feet of Water Main | 2 | Less than 50,000 gpd | Chlorine, Phosphate, Ion Exchange (Iron Removal) | No | Yes |

Artesian Water Company
Sussex County Stand-Alone Water Systems

| STAND-ALONE WATER SYSTEM | NUMBER OF CUSTOMERS | DISTRIBUTION SYSTEM | NO. OF WELLS | DNREC WELLFIELD ALLOCATION | TREATMENT | STORAGE | BACK-UP POWER |
|--|---------------------|--|--------------|---|---|------------------------------------|---------------|
| Beaver Creek (includes service to Shoreview Woods and Holland Mills) | 292 | 42,400 Feet of Water Main and 42 Fire Hydrants | 2 | 414,500 gpd | Chlorine, Caustic, Phosphate, Ion Exchange (Iron Removal) | 132,000 Gallon Ground Storage Tank | Yes |
| Cedar Landing | 108 | 8,546 Feet of Water Main | 2 | Less than 50,000 gpd | Chlorine, Phosphate, Ion Exchange (Iron Removal) | Hydro-Pneumatic Tanks | Yes |
| Ingram Village | 2 | 4,400 Feet of Water Main | - | One residential well was drilled to provide service to the first three homes. | No treatment required for a residential well. | Hydro-Pneumatic Tanks | No |

SUMMARY OF HISTORIC DELIVERY

| YEAR | | TOTAL DELIVERY | | | Maximum Day Demand | | Peak/Avg Ratio |
|------|------|----------------|-------------|------------------|--------------------|-------|----------------|
| | | Total MG | Average MGD | Percent Increase | Date | MGD | |
| 1970 | | | | | | | |
| 1971 | 1971 | 3518 | 9.64 | | 7/16 | 11.75 | 1.22 |
| 1972 | | 3703 | 10.12 | 5.0% | 8/27 | 13.96 | 1.38 |
| 1973 | | 3785 | 10.37 | 2.5% | 6/14 | 13.46 | 1.30 |
| 1974 | | 3860 | 10.58 | 2.0% | 7/17 | 14.27 | 1.35 |
| 1975 | 1975 | 3834 | 10.50 | -0.7% | 8/4 | 14.23 | 1.35 |
| 1976 | | 3918 | 10.70 | 1.9% | 6/30 | 14.62 | 1.37 |
| 1977 | | 4111 | 11.26 | 5.2% | 7/19 | 16.12 | 1.43 |
| 1978 | | 4059 | 11.12 | -1.3% | 7/25 | 14.40 | 1.29 |
| 1979 | | 4244 | 11.63 | 4.6% | 7/26 | 14.46 | 1.24 |
| 1980 | 1980 | 4415 | 12.06 | 3.7% | 6/29 | 15.71 | 1.30 |
| 1981 | | 4140 | 11.34 | -6.0% | 7/15 | 14.48 | 1.28 |
| 1982 | | 4236 | 11.61 | 2.3% | 7/21 | 15.86 | 1.37 |
| 1983 | | 4333 | 11.87 | 2.3% | 7/14 | 15.77 | 1.33 |
| 1984 | | 4379 | 11.96 | 0.8% | 6/12 | 15.42 | 1.29 |
| 1985 | 1985 | 4537 | 12.43 | 3.9% | 8/13 | 14.60 | 1.17 |
| 1986 | | 4928 | 13.50 | 8.6% | 6/4 | 17.90 | 1.33 |
| 1987 | | 5041 | 13.81 | 2.3% | 8/13 | 18.20 | 1.32 |
| 1988 | | 5422 | 14.81 | 7.3% | 6/23 | 20.80 | 1.40 |
| 1989 | | 5602 | 15.35 | 3.6% | 9/20 | 20.11 | 1.31 |
| 1990 | 1990 | 5641 | 15.45 | 0.7% | 8/5 | 20.10 | 1.30 |
| 1991 | | 6043 | 16.56 | 7.1% | 6/9 | 25.38 | 1.53 |
| 1992 | | 6208 | 16.96 | 2.4% | 7/15 | 24.03 | 1.42 |
| 1993 | | 6409 | 17.56 | 3.5% | 7/11 | 24.95 | 1.42 |
| 1994 | | 6506 | 17.82 | 1.5% | 6/16 | 26.98 | 1.51 |
| 1995 | 1995 | 6561 | 17.98 | 0.8% | 7/15 | 27.74 | 1.54 |
| 1996 | | 6414 | 17.57 | -2.2% | 6/15 | 22.00 | 1.25 |
| 1997 | | 6637 | 18.18 | 3.5% | 7/18 | 26.89 | 1.48 |
| 1998 | | 6739 | 18.46 | 1.5% | 9/01 | 24.27 | 1.31 |
| 1999 | | 6758 | 18.52 | 0.3% | 7/19 | 27.10 | 1.46 |
| 2000 | 2000 | 6881 | 18.85 | 1.8% | 5/07 | 25.31 | 1.34 |
| 2001 | | 7194 | 19.71 | 4.5% | 8/9 | 27.99 | 1.42 |
| 2002 | | 7198 | 19.72 | 0.1% | 6/19 | 27.08 | 1.37 |
| 2003 | | 7216 | 19.77 | 0.3% | 8/20 | 25.80 | 1.31 |
| 2004 | | 7119 | 19.50 | -1.3% | 6/7 | 25.60 | 1.31 |
| 2005 | 2005 | 7271 | 19.92 | 2.1% | 6/26 | 28.83 | 1.45 |
| 2006 | | 7698 | 21.09 | 5.9% | 5/9 | 29.30 | 1.39 |
| 2007 | | 7825 | 21.44 | 1.6% | 5/31 | 29.92 | 1.40 |
| 2008 | | 7655 | 20.97 | -2.2% | 4/27 | 29.86 | 1.42 |
| 2009 | | 7087 | 19.42 | -7.4% | 7/20 | 30.65 | 1.58 |
| 2010 | 2010 | 7596 | 20.81 | 7.2% | 9/20 | 32.82 | 1.58 |
| 2011 | | 7422 | 20.34 | -2.3% | 7/25 | 32.24 | 1.59 |
| 2012 | | 7462 | 20.39 | 0.2% | 7/16 | 29.76 | 1.46 |
| 2013 | | 7330 | 20.08 | -1.5% | 7/8 | 28.99 | 1.44 |

ANNUAL WELLFIELD PRODUCTION

All values are annual average and expressed in MGD

| WELLFIELD | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Northern New Castle County | | | | | | | | | | |
| Airport Ind. Park | 0.528 | 0.473 | 0.603 | 0.714 | 0.664 | 0.627 | 0.574 | 0.679 | 0.565 | 0.568 |
| Artisans Village | 2.594 | 2.562 | 2.371 | 2.592 | 2.561 | 2.498 | 2.571 | 2.606 | 2.188 | 2.266 |
| Caravel Farms | 0.120 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.055 | 0.062 | 0.006 | 0.000 |
| Castle Hills | 0.961 | 0.881 | 0.822 | 0.920 | 0.957 | 0.904 | 0.892 | 0.345 | 1.186 | 0.927 |
| Chesapeake City | 0.556 | 1.774 | 1.416 | 1.560 | 1.563 | 1.834 | 1.628 | 2.037 | 1.749 | 1.787 |
| Collins Park | 0.392 | 0.336 | 0.295 | 0.383 | 0.363 | 0.379 | 0.276 | 0.307 | 0.463 | 0.423 |
| Eastern States | 0.701 | 0.689 | 0.749 | 0.837 | 0.790 | 0.712 | 0.783 | 0.779 | 0.701 | 0.740 |
| Fairwinds | 1.332 | 1.209 | 1.240 | 1.460 | 1.248 | 1.161 | 1.248 | 1.365 | 1.546 | 1.389 |
| Glendale | 1.361 | 1.383 | 1.213 | 1.081 | 1.192 | 1.284 | 1.253 | 0.821 | 0.577 | 1.264 |
| Hockessin | 1.168 | 1.448 | 1.583 | 1.478 | 1.350 | 0.533 | 0.849 | 0.807 | 0.806 | 0.778 |
| Jefferson Farms | 0.663 | 0.744 | 0.744 | 0.767 | 0.744 | 0.595 | 0.681 | 0.438 | 0.573 | 0.563 |
| Llangollen Estates | 1.610 | 1.511 | 1.800 | 1.877 | 1.969 | 1.506 | 1.540 | 1.451 | 1.103 | 1.002 |
| Middle Run | 0.252 | 0.157 | 0.227 | 0.226 | 0.274 | 0.536 | 0.336 | 0.295 | 0.255 | 0.441 |
| Midvale | 0.142 | 0.091 | 0.066 | 0.197 | 0.043 | 0.116 | 0.072 | 0.146 | 0.309 | 0.241 |

ANNUAL WELLFIELD PRODUCTION

All values are annual average and expressed in MGD

| WELLFIELD | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Old County Road | 1.936 | 1.719 | 1.718 | 1.347 | 1.465 | 1.247 | 1.918 | 1.584 | 1.895 | 1.529 |
| Wilm. Airport | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| Wilm. Manor Gardens | 0.340 | 0.372 | 0.444 | 0.437 | 0.252 | 0.401 | 0.284 | 0.518 | 0.514 | 0.429 |
| Southern New Castle County | | | | | | | | | | |
| Augustine Creek | 0.007 | 0.003 | 0.023 | 0.033 | 0.035 | 0.030 | 0.038 | 0.042 | 0.042 | 0.040 |
| Bayview | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.002 | 0.003 | 0.003 | 0.003 | 0.003 |
| Bethel Church | 0.017 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Chestnut Grove | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Choptank | 0.135 | 0.234 | 0.377 | 0.452 | 0.551 | 0.623 | 0.637 | 0.813 | 0.662 | 0.489 |
| Commodore Estates | 0.011 | 0.011 | 0.011 | 0.011 | 0.012 | 0.011 | 0.011 | 0.010 | 0.009 | 0.009 |
| DE Correction Center | 0.576 | 0.519 | 0.532 | 0.515 | 0.453 | 0.460 | 0.478 | 0.477 | 0.374 | 0.270 |
| Hytt's Corner | 0.001 | 0.001 | 0.004 | 0.006 | 0.016 | 0.013 | 0.002 | 0.000 | 0.000 | 0.000 |
| Odessa Woods | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Levels | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL WELLFIELD PRODUCTION

All values are annual average and expressed in MGD

| WELLFIELD | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Stonefield | 0.035 | 0.082 | 0.140 | 0.156 | 0.167 | 0.163 | 0.203 | 0.136 | 0.140 | 0.168 |
| Thomas Cove | 0.100 | 0.093 | 0.054 | 0.088 | 0.065 | 0.051 | 0.046 | 0.124 | 0.124 | 0.111 |
| Townsend | 0.043 | 0.052 | 0.071 | 0.094 | 0.106 | 0.113 | 0.094 | 0.103 | 0.021 | 0.017 |
| Willow Grove | 0.098 | 0.108 | 0.143 | 0.235 | 0.135 | 0.137 | 0.273 | 0.296 | 0.257 | 0.271 |
| Kent County | | | | | | | | | | |
| Barkers Landing | 0.020 | 0.017 | 0.020 | 0.035 | 0.077 | 0.118 | 0.174 | 0.151 | 0.162 | 0.127 |
| Big Oak | 0.016 | 0.019 | 0.028 | 0.052 | 0.055 | 0.050 | 0.064 | 0.065 | 0.073 | 0.079 |
| Deer Meadows | 0.002 | 0.006 | 0.013 | 0.022 | 0.014 | 0.014 | 0.016 | 0.014 | 0.014 | 0.015 |
| Church Creek | 0.138 | 0.111 | 0.159 | 0.126 | 0.078 | 0.042 | 0.033 | 0.061 | 0.090 | 0.062 |
| Hunters Ridge | 0.000 | 0.000 | 0.005 | 0.042 | 0.046 | 0.000 | 0.000 | 0.000 | 0.000 | 0.054 |
| Jonathans Landing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Paradise Estates | 0.000 | 0.000 | 0.006 | 0.007 | 0.006 | 0.006 | 0.007 | 0.008 | 0.007 | 0.004 |
| Riverside | 0.000 | 0.005 | 0.010 | 0.035 | 0.042 | 0.073 | 0.077 | 0.074 | 0.047 | 0.057 |
| Riverview Estates | 0.004 | 0.008 | 0.000 | 0.013 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Weatherstone Crossing | | | | | | 0.000 | 0.009 | 0.007 | 0.007 | 0.017 |

ANNUAL WELLFIELD PRODUCTION

All values are annual average and expressed in MGD

| WELLFIELD | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Windsong | 0.007 | 0.011 | 0.016 | 0.040 | 0.046 | 0.040 | 0.080 | 0.119 | 0.129 | 0.068 |
| Timber Mills | | 0.002 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sussex County | | | | | | | | | | |
| Bayville | 0.291 | 0.425 | 0.423 | 0.579 | 0.600 | 0.483 | 0.595 | 0.504 | 0.491 | 0.525 |
| Beaver Creek | | | | 0.036 | 0.029 | 0.023 | 0.028 | 0.027 | 0.031 | 0.037 |
| Cedar Landing | 0.013 | 0.012 | 0.015 | 0.013 | 0.011 | 0.011 | 0.014 | 0.009 | 0.010 | 0.009 |
| Heron Bay | | | | 0.012 | 0.025 | 0.057 | 0.079 | 0.081 | 0.086 | 0.088 |
| Holland Mills | | | | | | 0.000 | 0.009 | 0.005 | 0.008 | 0.004 |
| South Bethany | 0.241 | 0.130 | 0.171 | 0.124 | 0.111 | 0.119 | 0.156 | 0.199 | 0.210 | 0.179 |
| Stonewater Creek | | 0.014 | 0.027 | 0.050 | 0.035 | 0.000 | 0.002 | 0.000 | 0.002 | 0.000 |

Test Year Well Production
January through December 2013

| WELLFIELD | 2013 | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|-----------------------------------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Northern New Castle County | | | | | | | | | | | | | | |
| Airport Industrial Park | MG | 17.870 | 17.225 | 19.384 | 17.594 | 16.568 | 17.263 | 19.163 | 20.798 | 5.953 | 15.751 | 17.504 | 22.246 | 207.319 |
| | MGD | 0.576 | 0.615 | 0.625 | 0.586 | 0.534 | 0.575 | 0.618 | 0.671 | 0.198 | 0.508 | 0.583 | 0.718 | 0.568 |
| Artisans Village | MG | 70.519 | 63.374 | 70.283 | 66.442 | 69.828 | 70.215 | 71.852 | 72.718 | 69.022 | 70.476 | 64.295 | 67.973 | 826.997 |
| | MGD | 2.275 | 2.263 | 2.267 | 2.215 | 2.253 | 2.341 | 2.318 | 2.346 | 2.301 | 2.273 | 2.143 | 2.193 | 2.266 |
| Caravel Farms | MG | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | MGD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Castle Hills | MG | 38.111 | 34.125 | 37.163 | 35.734 | 37.222 | 35.813 | 37.287 | 38.319 | 36.430 | 7.981 | 0.000 | 0.000 | 338.185 |
| | MGD | 1.229 | 1.219 | 1.199 | 1.191 | 1.201 | 1.194 | 1.203 | 1.236 | 1.214 | 0.257 | 0.000 | 0.000 | 0.927 |
| Chesapeake City Rd | MG | 61.812 | 53.748 | 49.509 | 50.197 | 48.089 | 51.754 | 61.711 | 58.228 | 58.156 | 50.928 | 51.298 | 56.887 | 652.317 |
| | MGD | 1.994 | 1.920 | 1.597 | 1.673 | 1.551 | 1.725 | 1.991 | 1.878 | 1.939 | 1.643 | 1.710 | 1.835 | 1.787 |
| Collins Park | MG | 12.511 | 11.890 | 13.490 | 13.101 | 12.533 | 12.571 | 12.623 | 13.027 | 11.158 | 13.493 | 13.714 | 14.198 | 154.309 |
| | MGD | 0.404 | 0.425 | 0.435 | 0.437 | 0.404 | 0.419 | 0.407 | 0.420 | 0.372 | 0.435 | 0.457 | 0.458 | 0.423 |
| Eastern States | MG | 23.860 | 12.839 | 24.364 | 24.358 | 24.137 | 24.411 | 25.484 | 24.325 | 24.551 | 23.616 | 21.728 | 16.450 | 270.123 |
| | MGD | 0.770 | 0.459 | 0.786 | 0.812 | 0.779 | 0.814 | 0.822 | 0.785 | 0.818 | 0.762 | 0.724 | 0.531 | 0.740 |
| Fairwinds | MG | 43.129 | 38.605 | 42.334 | 41.665 | 42.781 | 41.740 | 43.562 | 42.947 | 41.756 | 43.437 | 41.847 | 43.046 | 506.849 |
| | MGD | 1.391 | 1.379 | 1.366 | 1.389 | 1.380 | 1.391 | 1.405 | 1.385 | 1.392 | 1.401 | 1.395 | 1.389 | 1.389 |
| Glendale | MG | 32.130 | 36.677 | 41.383 | 39.907 | 40.439 | 36.938 | 41.531 | 39.323 | 38.348 | 39.527 | 37.530 | 37.573 | 461.306 |

Test Year Well Production
January through December 2013

| WELLFIELD | 2013 | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|---------------------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | MGD | 1.036 | 1.310 | 1.335 | 1.330 | 1.304 | 1.231 | 1.340 | 1.268 | 1.278 | 1.275 | 1.251 | 1.212 | 1.264 |
| Hockessin | MG | 12.565 | 1.673 | 2.258 | 25.773 | 36.886 | 31.500 | 35.562 | 31.335 | 38.278 | 24.813 | 20.895 | 22.612 | 284.150 |
| | MGD | 0.405 | 0.060 | 0.073 | 0.859 | 1.190 | 1.050 | 1.147 | 1.011 | 1.276 | 0.800 | 0.697 | 0.729 | 0.778 |
| Jefferson Farms | MG | 21.141 | 18.853 | 20.181 | 3.435 | 17.034 | 19.995 | 18.912 | 10.272 | 21.032 | 21.994 | 13.917 | 18.803 | 205.569 |
| | MGD | 0.682 | 0.673 | 0.651 | 0.115 | 0.549 | 0.667 | 0.610 | 0.331 | 0.701 | 0.709 | 0.464 | 0.607 | 0.563 |
| Liangollen | MG | 30.506 | 42.525 | 30.535 | 25.799 | 28.696 | 29.359 | 28.103 | 31.211 | 29.928 | 29.421 | 29.321 | 30.347 | 365.751 |
| | MGD | 0.984 | 1.519 | 0.985 | 0.860 | 0.926 | 0.979 | 0.907 | 1.007 | 0.998 | 0.949 | 0.977 | 0.979 | 1.002 |
| Middle Run | MG | 0.000 | 0.000 | 0.000 | 16.245 | 19.765 | 23.272 | 20.452 | 20.457 | 21.456 | 16.024 | 9.278 | 13.982 | 160.931 |
| | MGD | 0.000 | 0.000 | 0.000 | 0.542 | 0.638 | 0.776 | 0.660 | 0.660 | 0.715 | 0.517 | 0.309 | 0.451 | 0.441 |
| Midvale | MG | 0.000 | 0.000 | 0.000 | 6.006 | 11.773 | 12.263 | 12.797 | 8.993 | 5.919 | 9.946 | 10.154 | 10.264 | 88.115 |
| | MGD | 0.000 | 0.000 | 0.000 | 0.200 | 0.380 | 0.409 | 0.413 | 0.290 | 0.197 | 0.321 | 0.338 | 0.331 | 0.241 |
| Old County Road | MG | 60.381 | 49.911 | 46.152 | 46.841 | 45.376 | 44.606 | 48.337 | 44.752 | 45.176 | 42.292 | 40.398 | 43.934 | 558.156 |
| | MGD | 1.948 | 1.783 | 1.489 | 1.561 | 1.464 | 1.487 | 1.559 | 1.444 | 1.506 | 1.364 | 1.347 | 1.417 | 1.529 |
| Wilm. Manor Gardens | MG | 0.000 | 0.262 | 10.029 | 16.964 | 17.054 | 14.450 | 16.680 | 16.619 | 14.013 | 15.303 | 14.428 | 19.795 | 156.596 |
| | MGD | 0.000 | 0.009 | 0.324 | 0.565 | 0.550 | 0.482 | 0.538 | 0.536 | 0.467 | 0.494 | 0.481 | 0.639 | 0.429 |
| Wilm. Airport | MG | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | MGD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Totals | MG | 424.535 | 381.707 | 407.065 | 424.055 | 456.408 | 453.887 | 481.259 | 464.331 | 455.257 | 415.056 | 376.153 | 407.846 | 5236.673 |

Test Year Well Production
January through December 2013

| WELLFIELD | | 2013 | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|--------------|-----|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Keilkopf | MG | | 0.054 | 0.049 | 0.073 | 0.114 | 0.067 | 0.052 | 0.063 | 0.054 | 0.068 | 0.055 | 0.055 | 0.060 | 0.763 |
| | MGD | | 0.002 | 0.002 | 0.002 | 0.004 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Levels | MG | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | MGD | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Stonefield | MG | | 2.900 | 2.304 | 3.606 | 3.721 | 4.094 | 4.413 | 5.480 | 5.273 | 7.080 | 5.885 | 6.625 | 9.999 | 61.380 |
| | MGD | | 0.094 | 0.082 | 0.116 | 0.124 | 0.132 | 0.147 | 0.177 | 0.177 | 0.170 | 0.236 | 0.190 | 0.221 | 0.323 |
| Thomas Cove | MG | | 4.310 | 4.192 | 3.617 | 3.331 | 4.421 | 4.104 | 3.612 | 2.929 | 2.040 | 3.840 | 3.387 | 0.798 | 40.581 |
| | MGD | | 0.139 | 0.150 | 0.117 | 0.111 | 0.143 | 0.137 | 0.117 | 0.117 | 0.094 | 0.068 | 0.124 | 0.113 | 0.026 |
| Townsend | MG | | 0.195 | 0.117 | 0.115 | 0.154 | 0.332 | 0.674 | 1.234 | 1.015 | 1.284 | 1.024 | 0.000 | 0.036 | 6.180 |
| | MGD | | 0.006 | 0.004 | 0.004 | 0.005 | 0.011 | 0.022 | 0.040 | 0.040 | 0.033 | 0.034 | 0.000 | 0.001 | 0.017 |
| Willow Grove | MG | | 8.925 | 9.760 | 12.010 | 5.068 | 5.485 | 7.849 | 9.028 | 9.025 | 5.398 | 7.694 | 8.122 | 10.431 | 98.795 |
| | MGD | | 0.288 | 0.054 | 0.387 | 0.169 | 0.177 | 0.262 | 0.291 | 0.291 | 0.291 | 0.248 | 0.271 | 0.336 | 0.271 |
| Totals | MG | | 31.252 | 32.949 | 37.016 | 37.562 | 46.875 | 46.894 | 49.006 | 45.119 | 51.924 | 46.535 | 39.324 | 39.306 | 503.763 |
| | MGD | | 1.008 | 1.177 | 1.194 | 1.252 | 1.512 | 1.563 | 1.581 | 1.581 | 1.455 | 1.501 | 1.311 | 1.268 | 1.380 |

| Kent County | | | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|-----------------|-----|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Barkers Landing | MG | | 7.494 | 5.046 | 4.628 | 4.994 | 2.617 | 3.420 | 2.893 | 3.491 | 4.210 | 2.851 | 2.160 | 2.665 | 46.469 |
| | MGD | | 0.242 | 0.180 | 0.149 | 0.166 | 0.084 | 0.114 | 0.093 | 0.093 | 0.113 | 0.140 | 0.092 | 0.072 | 0.086 |

Test Year Well Production
January through December 2013

| | | 2013 | | | | | | | | | | | | |
|-----------------------|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| WELLFIELD | | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Total |
| Weatherstone Crossing | MG | 0.930 | 0.527 | 0.546 | 0.676 | 0.337 | 0.402 | 0.507 | 0.578 | 0.423 | 0.371 | 0.371 | 0.421 | 6.089 |
| | MGD | 0.030 | 0.019 | 0.018 | 0.023 | 0.011 | 0.013 | 0.016 | 0.019 | 0.014 | 0.012 | 0.012 | 0.014 | 0.017 |
| Windsong | MG | 2.739 | 2.023 | 1.470 | 1.548 | 1.659 | 1.950 | 1.860 | 2.253 | 2.520 | 2.286 | 2.268 | 2.086 | 24.662 |
| | MGD | 0.088 | 0.072 | 0.047 | 0.052 | 0.054 | 0.065 | 0.060 | 0.073 | 0.084 | 0.074 | 0.076 | 0.067 | 0.068 |
| Total | MG | 16.165 | 12.526 | 13.524 | 15.256 | 16.549 | 18.076 | 21.247 | 18.272 | 20.532 | 18.128 | 17.926 | 16.912 | 176.176 |
| | MGD | 0.521 | 0.418 | 0.436 | 0.492 | 0.591 | 0.583 | 0.708 | 0.589 | 0.684 | 0.585 | 0.598 | 0.546 | 0.483 |

Sussex County

| | | | | | | | | | | | | | | |
|---------------|-----|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|-------|---------|
| Bayville | MG | 8.559 | 8.400 | 3.479 | 8.828 | 12.726 | 18.488 | 31.557 | 26.746 | 25.906 | 27.870 | 12.666 | 6.546 | 191.771 |
| | MGD | 0.276 | 0.300 | 0.112 | 0.294 | 0.411 | 0.616 | 1.018 | 0.863 | 0.864 | 0.899 | 0.422 | 0.211 | 0.525 |
| Beaver Creek | MG | 0.933 | 0.659 | 0.745 | 1.042 | 0.828 | 0.910 | 1.429 | 1.893 | 1.427 | 1.266 | 1.030 | 1.438 | 13.600 |
| | MGD | 0.030 | 0.024 | 0.024 | 0.035 | 0.027 | 0.030 | 0.046 | 0.061 | 0.048 | 0.041 | 0.034 | 0.046 | 0.037 |
| Cedar Landing | MG | 0.256 | 0.163 | 0.191 | 0.255 | 0.350 | 0.313 | 0.640 | 0.372 | 0.297 | 0.226 | 0.182 | 0.197 | 3.440 |
| | MGD | 0.008 | 0.006 | 0.006 | 0.009 | 0.011 | 0.010 | 0.021 | 0.012 | 0.010 | 0.007 | 0.006 | 0.006 | 0.009 |
| Heron Bay | MG | 2.157 | 1.829 | 1.857 | 2.331 | 3.089 | 2.921 | 3.826 | 3.447 | 3.536 | 2.698 | 2.112 | 2.439 | 32.242 |
| | MGD | 0.070 | 0.065 | 0.060 | 0.078 | 0.100 | 0.097 | 0.123 | 0.111 | 0.118 | 0.087 | 0.070 | 0.079 | 0.088 |
| Holland Mills | MG | 0.223 | 0.137 | 0.134 | 0.204 | 0.245 | 0.216 | 0.338 | 0.118 | 0.000 | 0.000 | 0.000 | 0.000 | 1.614 |
| | MGD | 0.007 | 0.005 | 0.004 | 0.007 | 0.008 | 0.007 | 0.011 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 |

Test Year Well Production
January through December 2013

| WELLFIELD | 2013 | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>June</u> | <u>Jul</u> | <u>Aug</u> | <u>Sept</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> | <u>Total</u> |
|------------------|------|------------|------------|------------|------------|------------|-------------|------------|------------|-------------|------------|------------|------------|--------------|
| South Bethany | MG | 2.617 | 3.224 | 5.338 | 4.872 | 6.834 | 7.605 | 15.853 | 10.888 | 3.487 | 0.079 | 0.000 | 4.531 | 65.328 |
| | MGD | 0.084 | 0.115 | 0.172 | 0.162 | 0.220 | 0.254 | 0.511 | 0.351 | 0.116 | 0.003 | 0.000 | 0.146 | 0.179 |
| Stonewater Creek | MG | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.039 | 0.006 | 0.000 | 0.005 | 0.002 | 0.053 |
| | MGD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ===== | | | | | | | | | | | | | | |
| Total | MG | 14.745 | 14.412 | 11.744 | 17.532 | 24.073 | 30.452 | 53.643 | 43.502 | 34.659 | 32.139 | 15.995 | 15.153 | 308.048 |
| | MGD | 0.476 | 0.515 | 0.379 | 0.584 | 0.777 | 1.015 | 1.730 | 1.403 | 1.155 | 1.037 | 0.533 | 0.489 | 0.844 |

DNREC WELLFIELD ALLOCATION LIMITATIONS

| WELLFIELD | ALLOCATION LIMITS | | | | | |
|--------------------------|-------------------|----------------|-------------------|---------------------|-------------------|---------------------------|
| | MAXIMUM GPM | MAXIMUM MGD | MAX DAY MGD | MAX 30-DAY MG | MAX YEAR MG | DRAWDOWN LIMIT FEET |
| New Castle County | | | | | | |
| Airport Ind. Park | | | 0.720 | 21.600 | 262.800 | |
| | 1 | 250 | 0.360 | | | 100 |
| | 2 | 250 | 0.360 | | | 97 |
| Artisans Village | | | 3.024 | 90.720 | 1088.640 | |
| | 1 | 1100 | 1.584 | | | 130 |
| | 2 | 300 | 0.432 | | | 125 |
| | 3 | 700 | 1.080 | | | 125 |
| | 4 | 150 | 0.216 | | | 116 |
| Brennan Estates | | | 3.166 | 95.040 | 976.740 | |
| | 1R | 900 | 1.296 | | | 315 |
| | 2R | 750 | 1.080 | | | 447 |
| | 3 | 550 | 0.792 | | | 510 |
| Chesapeake City | | | 1.166 | 34.980 | 419.700 | |
| | 1 | 50 | 0.050 | | | 97 |
| | 2 | 225 | 0.324 | | | 98 |
| | 3 | 550 | 0.792 | | | 510 |
| Castle Hills | | | 1.368 | 42.408 | 499.320 | |
| | 1* | 100 | 0.144 | | | N/A |
| | 2 | 250 | 0.360 | | | 94 |
| | 4 | 600 | 0.864 | | | 98 |
| | 5 | 450 | 0.648 | | | N/A |
| Collins Park | | | 0.576 | 17.280 | 180.000 | |
| | 1 | 400 | 0.576 | | | 94 |
| Caravel Farms | | | 0.360 | 10.800 | 105.120 | |
| | 1 | 250 | 0.360 | | | 55 |
| Eastern States | | | 1.290 | 38.500 | 365.000 | |
| | 1 | 600 | 0.864 | | | 135 |
| | 2 | 300 | 0.432 | | | 110 |
| Fairwinds | | | 2.000 | 60.000 | 720.000 | |
| | 2 | 370 | 0.533 | | | 120 |
| | 4R | 350 | 0.504 | | | 105 |
| | 5 | 400 | 0.576 | | | 105 |
| | 6 | 225 | 0.324 | | | 110 |
| | ASR | 125 | 0.180 | | | 320 |

DNREC WELLFIELD ALLOCATION LIMITATIONS

| WELLFIELD | ALLOCATION LIMITS | | | | | DRAWDOWN LIMIT FEET |
|---------------------|-------------------|----------------|-------------------|---------------------|-------------------|---------------------------|
| | MAXIMUM GPM | MAXIMUM MGD | MAX DAY MGD | MAX 30-DAY MG | MAX YEAR MG | |
| Glendale | | | | | | |
| Columbia Wells | | | 0.500 | 15.000 | 180.000 | |
| 2 | 350 | 0.504 | | | | N/A |
| 4R* | 100 | 0.144 | | | | N/A |
| Potomac Wells | | | 1.301 | 39.030 | 474.865 | |
| 5 | 275 | 0.400 | | | | 100 |
| 6 | 225 | 0.325 | | | | 92 |
| 7 | 400 | 0.576 | | | | 116 |
| Hockessin | | | 3.000 | 100.000 | 693.500 | |
| G-1 | 400 | 0.576 | | | | 125 |
| G-3* | 300 | 0.432 | | | | 115 |
| 1* | 425 | 0.612 | | | | 120 |
| 2 | 425 | 0.612 | | | | 200 |
| 3 | 425 | 0.612 | | | | 120 |
| 4 | 700 | 1.008 | | | | 100 |
| Jefferson Farms | | | 1.296 | 38.880 | 466.560 | |
| 1R | 600 | 0.864 | | | | 94 |
| 2R | 600 | 0.864 | | | | 92 |
| Llangollen | | | 2.218 | 66.500 | 720.000 | |
| 2 | 320 | 0.461 | | | | 120 |
| 6 | 600 | 0.864 | | | | 110 |
| 7 | 600 | 0.864 | | | | 97 |
| G-3R | 1220 | 0.893 | | | | 98 |
| ASR | 1000 | 1.440 | | | | 92 |
| Middle Run | | | 1.080 | 32.400 | 394.200 | |
| 1 | 300 | 0.432 | | | | 152 |
| 2 | 450 | 0.648 | | | | 116 |
| Midvale | | | 0.576 | 17.280 | 207.360 | |
| 1 | 200 | 0.288 | | | | N/A |
| 2 | 200 | 0.288 | | | | N/A |
| Old County Road | | | 3.160 | 95.040 | 720.000 | |
| 1 | 1000 | 1.440 | | | | 320 |
| 2 | 1200 | 1.728 | | | | 413 |
| Wilm. Manor Gardens | | | 0.780 | 23.400 | 284.700 | |
| 1* | 200 | 0.288 | | | | N/A |
| 3 | 350 | 0.492 | | | | N/A |

DNREC WELLFIELD ALLOCATION LIMITATIONS

| WELLFIELD | ALLOCATION LIMITS | | | | | | |
|----------------------------|-------------------|----------------|--------|-------------------|---------------------|-------------------|---------------------------|
| | | MAXIMUM GPM | MGD | MAX DAY MGD | MAX 30-DAY MG | MAX YEAR MG | DRAWDOWN LIMIT FEET |
| Wilm. Airport | | | | 0.864 | 25.920 | 311.040 | |
| | 1* | 200 | 0.288 | | | | 185 |
| | 2 | 200 | 0.288 | | | | 208 |
| | 3 | 200 | 0.288 | | | | 134 |
| Augustine Creek | | | | 0.124 | 3.000 | 25.000 | |
| | 1 | 50 | 0.072 | | | | 422 |
| | 2 | 80 | 0.115 | | | | 422 |
| | 3 | 65 | 0.094 | | | | 86 |
| Bayview | | | | 0.430 | 12.900 | 156.950 | |
| | 1R | 100 | 0.144 | | | | 120 |
| | 2R | 100 | 0.144 | | | | 120 |
| | 3 | 300 | 0.432 | | | | 120 |
| Bethel Church | | | | 1.000 | 30.000 | 365.000 | |
| | 1 | 700 | 1 | | | | 500 |
| | 2 | 50 | 0.05 | | | | 98 |
| Chestnut Grove | | | | 0.650 | 19.500 | 237.250 | |
| | 1 | 600 | 0.650 | | | | 410 |
| Choptank | | | | 2.376 | 63.000 | 730.000 | |
| | 1 | 250 | 0.360 | | | | 510 |
| | 2 | 400 | 0.576 | | | | 210 |
| | 3 | 1000 | 1.440 | | | | 803 |
| Commodore Estates | | | | 0.430 | 12.900 | 156.950 | |
| | 1 | 350 | 0.430 | | | | 345 |
| | 2 | 70 | 0.050 | | | | 90 |
| Delaware Correction Center | | | | 2.131 | 63.94 | 777.888 | |
| | 1 | 180 | 0.2592 | | | | 154 |
| | 2 | 500 | 0.720 | | | | 172 |
| | 3 | 400 | 0.567 | | | | 390 |
| | 4 | 400 | 0.567 | | | | 353 |
| Emerson Farm | | | | 0.290 | 8.700 | 105.850 | |
| | 1 | 250 | 0.290 | | | | 378 |
| Lester Farm | | | | 1.000 | 30.000 | 365.000 | |
| | 1 | 500 | 0.720 | | | | 400 |
| | 2 | 350 | 0.5043 | | | | 400 |

DNREC WELLFIELD ALLOCATION LIMITATIONS

| WELLFIELD | | ALLOCATION LIMITS | | | | DRAWDOWN LIMIT FEET | |
|--------------------|----|-------------------|----------------|-------------------|---------------------|---------------------------|-------------------|
| | | MAXIMUM GPM | MAXIMUM MGD | MAX DAY MGD | MAX 30-DAY MG | | MAX YEAR MG |
| Stonefield | | | | 0.580 | 17.400 | 211.700 | |
| | 1 | 450 | 0.580 | | | | 658 |
| Thomas Cove | | | | 0.290 | 8.700 | 105.850 | |
| | 1 | 250 | 0.290 | | | | 192 |
| | 2 | 250 | 0.290 | | | | 192 |
| Townsend | | | | 0.500 | 15.000 | 182.500 | |
| | 1R | 225 | 0.324 | | | | 63 |
| | 2R | 225 | 0.324 | | | | 63 |
| Willow Grove | | | | 0.792 | 23.800 | 289.080 | |
| | 1 | 450 | 0.648 | | | | 380 |
| | 2 | 100 | 0.144 | | | | 154 |
| | 3 | 500 | 0.792 | | | | 380 |
| Kent County | | | | | | | |
| Barkers Landing | | | | 0.400 | 8.000 | 75.000 | |
| | 1 | 400 | 0.400 | | | | 196 |
| | 2 | 700 | 0.400 | | | | 128 |
| Big Oak | | | | 0.576 | 17.280 | 210.240 | |
| | 1 | 400 | 0.576 | | | | N/A |
| | 2 | 400 | 0.576 | | | | N/A |
| Church Creek | | | | 0.468 | 14.040 | 170.820 | |
| | 1 | 325 | 0.468 | | | | 135 |
| | 2 | 325 | 0.468 | | | | 135 |
| Hunters Ridge | | | | 0.1 | 3.02 | 26.2 | |
| | 1 | 75 | 0.100 | | | | 195 |
| Riverside | | | | 0.093 | 2.8 | 22.24 | |
| | 1 | 65 | 0.093 | | | | 200 |
| Riverview | | | | 0.11 | 3.02 | 26.28 | |
| | 1 | 75 | 0.108 | | | | 200 |
| Weatherstone | | | | 0.864 | 25.800 | 309.600 | |

DNREC WELLFIELD ALLOCATION LIMITATIONS

| WELLFIELD | | ALLOCATION LIMITS | | | | DRAWDOWN LIMIT FEET |
|----------------------|---|-------------------|----------------|-------------------|---------------------|---------------------------|
| | | MAXIMUM GPM | MAXIMUM MGD | MAX DAY MGD | MAX 30-DAY MG | |
| | 1 | 450 | 0.648 | | | 171 |
| | 2 | 600 | 0.864 | | | 150 |
| Windsong | | | | 0.648 | 19.440 | 236.520 |
| | 1 | 200 | 0.288 | | | 255 |
| | 2 | 250 | 0.360 | | | 430 |
| Sussex County | | | | | | |
| Bayville | | | | 2.016 | 60.48 | 735.84 |
| | 1 | 700 | 1.008 | | | 290 |
| | 2 | 700 | 1.008 | | | 90 |
| | 3 | 700 | 1.008 | | | 83 |
| Beaver Creek | | | | 0.415 | 8.29 | 50.435 |
| | 2 | 450 | 0.415 | | | N/A |
| | 3 | 525 | 0.415 | | | N/A |
| Heron Bay | | | | 2.448 | 41.4 | 420.48 |
| | 1 | 500 | 0.72 | | | N/A |
| | 2 | 1200 | 2.448 | | | N/A |
| South Bethany | | | | 2.304 | 47.52 | 287.28 |
| | 1 | 1500 | 2.16 | | | 312 |
| | 2 | 1000 | 1.44 | | | 185 |
| Stonewater Creek | | | | 1.728 | 41.4 | 420.48 |
| | 1 | 600 | 0.864 | | | N/A |
| | 2 | 1200 | 1.728 | | | N/A |
| | 3 | 1200 | 1.728 | | | N/A |

NOTES:

* Marginal well

Standby well for emergency use only.

Wellfield Constraints

Airport Industrial Park

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Artisans Village

Wellfield capacity is limited by allocation permit pumping limits and water level drawdown limits.

Caravel Farms

Wellfield capacity is constrained by allocation permit water level drawdown limits. Given its relatively low capacity, this well is designated for Emergency Use.

Castle Hills

Well #1 is marginal and is designated for Emergency Use.

Chesapeake City Road

Wellfield production reflects addition of new supply wells. Wellfield is limited by allocation permit pumping limits. Well #1 is marginal and designated for Emergency Use.

Collins Park

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Eastern States

Wellfield capacity is limited by allocation permit drawdown limits.

Fairwinds

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Glendale

Wellfield capacity is constrained by allocation permit water level drawdown limits. Well #4R may add a small increment of supply to meet peak demand.

Hockessin

Wellfield capacity is limited by allocation permit drawdown limits and actual demand in this part of Artesian's system. Well G-3 is constrained by water quality and is currently designated for Emergency Use.

Llangollen

Wellfield limited by allocation permit pumping limits.

Middle Run

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Midvale

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Old County Road

Wellfield capacity is limited by allocation permit pumping and drawdown limits.

Wilmington Airport

Wellfield capacity is limited by the capacity and manpower requirements of the iron removal plant.

Wilmington Manor Gardens

Wellfield capacity is constrained by allocation permit water level drawdown limits. Additionally, Well #1 is limited by water quality.

Chestnut Grove

Well #1 is used for backup to Willow Grove due to need for iron removal.

Jonathan's Landing

Well #1 is used for backup to Church Creek due to marginal iron levels.

TEST PERIOD WATER SUPPLY NEED

| | Number Customers | Per Customer Delivery (gpcd) | Average Daily Demand (gpd) | Monthly Demand (MG) | Monthly Wellfield Pumpage (MG) | Purchased Water (MG) |
|--------|------------------|------------------------------|----------------------------|---------------------|--------------------------------|----------------------|
| Oct-13 | 79,560 | 243 | 19,333,080 | 599.33 | 506.72 | 92.61 |
| Nov-13 | 79,617 | 233 | 18,550,761 | 556.52 | 453.77 | 102.75 |
| Dec-13 | 79,706 | 235 | 18,730,910 | 580.66 | 481.01 | 99.65 |
| Jan-14 | 79,772 | 242 | 19,304,930 | 598.45 | 499.56 | 98.89 |
| Feb-14 | 79,839 | 242 | 19,321,009 | 540.99 | 451.67 | 89.32 |
| Mar-14 | 79,905 | 239 | 19,097,371 | 592.02 | 493.13 | 98.89 |
| Apr-14 | 79,972 | 250 | 19,992,940 | 599.79 | 504.09 | 95.70 |
| May-14 | 80,038 | 268 | 21,450,238 | 664.96 | 566.07 | 98.89 |
| Jun-14 | 80,105 | 289 | 23,150,241 | 694.51 | 598.81 | 95.70 |
| Jul-14 | 80,171 | 306 | 24,532,350 | 760.50 | 661.61 | 98.89 |
| Aug-14 | 80,238 | 281 | 22,546,743 | 698.95 | 600.06 | 98.89 |
| Sep-14 | 80,304 | 260 | 20,879,030 | 626.37 | 530.67 | 95.70 |
| MG | | | | 7513.04 | 6347.16 | 1165.88 |
| MGD | | | | 20.58 | 17.39 | 3.19 |

Oct thru Dec are actual
Feb thru Sep are projected
Per customer delivery for 2014 based upon 5-year average

ANNUALIZED SUPPLY NEEDS FOR TEST PERIOD
October 2013 through September 2014

| | Number Customers | Per Customer Delivery (gpcd) | Projected Average Daily Demand (gpd) | Monthly Demand (MG) | Monthly Wellfield Pumpage (MG) | Projected Purchase (MG) |
|--------|------------------|------------------------------|--------------------------------------|---------------------|--------------------------------|-------------------------|
| Oct-13 | 80,304 | 243 | 19,513,872 | 604.93 | 506.04 | 98.89 |
| Nov-13 | 80,304 | 233 | 18,710,832 | 561.32 | 465.62 | 95.70 |
| Dec-13 | 80,304 | 235 | 18,871,440 | 585.01 | 486.12 | 98.89 |
| Jan-14 | 80,304 | 242 | 19,433,568 | 602.44 | 503.55 | 98.89 |
| Feb-14 | 80,304 | 242 | 19,433,568 | 544.14 | 454.82 | 89.32 |
| Mar-14 | 80,304 | 239 | 19,192,656 | 594.97 | 496.08 | 98.89 |
| Apr-14 | 80,304 | 250 | 20,076,000 | 602.28 | 506.58 | 95.70 |
| May-14 | 80,304 | 268 | 21,521,472 | 667.17 | 568.28 | 98.89 |
| Jun-14 | 80,304 | 289 | 23,207,856 | 696.24 | 600.54 | 95.70 |
| Jul-14 | 80,304 | 306 | 24,573,024 | 761.76 | 662.87 | 98.89 |
| Aug-14 | 80,304 | 281 | 22,565,424 | 699.53 | 600.64 | 98.89 |
| Sep-14 | 80,304 | 260 | 20,879,040 | 626.37 | 530.67 | 95.70 |
| MG | | | | 7546.17 | 6381.82 | 1164.35 |
| MGD | | | | 20.67 | 17.44 | 3.19 |

| W Labels | Name | Project Description | Sum of Estimates2 |
|------------------|-------------------------------------|----------------------------------|---------------------|
| 311000000 | Structures & Improve Sup,Pmps | Hockessin Well Houses | 209,373.34 |
| 311000000 | Structures & Improve Sup,Pmps | Jefferson Farms Well 2 Replace | 2,212.64 |
| 311000000 | Structures & Improve Sup,Pmps Total | | 211,585.98 |
| 311000000 | Total | | 211,585.98 |
| 314000000 | Source Of Supp Struct (Wells) | 2013 Well Replacements | - |
| 314000000 | Source Of Supp Struct (Wells) | Augustine Creek Allocation | 13,142.86 |
| 314000000 | Source Of Supp Struct (Wells) | Choptank Well Investigation | 68,037.32 |
| 314000000 | Source Of Supp Struct (Wells) | Fairwinds Well #6 Replacement | 249,000.00 |
| 314000000 | Source Of Supp Struct (Wells) | Hunter's Ridge Allocation Incr | 3,184.89 |
| 314000000 | Source Of Supp Struct (Wells) | Hyetts Well DNREC Allocation | 3,941.83 |
| 314000000 | Source Of Supp Struct (Wells) | Ingram Village Well | 83,585.25 |
| 314000000 | Source Of Supp Struct (Wells) | Jefferson Farms ATS | 18,227.35 |
| 314000000 | Source Of Supp Struct (Wells) | Jefferson Farms Well 2 Replace | 287,997.86 |
| 314000000 | Source Of Supp Struct (Wells) | Kelly Well Replacement Budget | 6,298.73 |
| 314000000 | Source Of Supp Struct (Wells) | Llangollen ASR DNREC UIC Permi | 6,722.40 |
| 314000000 | Source Of Supp Struct (Wells) | Llangollen Well # G3 Replacement | 329,007.34 |
| 314000000 | Source Of Supp Struct (Wells) | Magnolia System DRBC permit | 11,876.82 |
| 314000000 | Source Of Supp Struct (Wells) | Old County Road allocation | 2,047.58 |
| 314000000 | Source Of Supp Struct (Wells) | Riverside Allocation Increase | 5,566.17 |
| 314000000 | Source Of Supp Struct (Wells) | Riverview Allocation Increase | 3,214.72 |
| 314000000 | Source Of Supp Struct (Wells) Total | | 1,091,851.12 |
| 314000000 | Total | | 1,091,851.12 |
| 320000000 | Land & Land Rights-Pumping | I-95 Crossover Booster Station | 182,898.17 |
| 320000000 | Land & Land Rights-Pumping Total | | 182,898.17 |
| 320000000 | Total | | 182,898.17 |
| 321000000 | Struct & Improves (Pump Hses) | Blacktop for Station Driveways | 50,000.00 |
| 321000000 | Struct & Improves (Pump Hses) | Fac. Main. Station Improvement | 75,000.00 |
| 321000000 | Struct & Improves (Pump Hses) | I-95 Crossover Booster Station | 1,359,172.76 |
| 321000000 | Struct & Improves (Pump Hses) | Roofs at Stations | 75,000.00 |
| 321000000 | Struct & Improves (Pump Hses) | South Heald Street Interconnec | 37,073.42 |
| 321000000 | Struct & Improves (Pump Hses) | Station and Tank Fence Replace | 45,000.00 |
| 321000000 | Struct & Improves (Pump Hses) | Sussex Station Improv 2013 | 36,000.00 |
| 321000000 | Struct & Improves (Pump Hses) Total | | 1,677,246.18 |
| 321000000 | Total | | 1,677,246.18 |
| 323000000 | Power Production Equipment | Augustine Creek Generator | 60,000.00 |
| 323000000 | Power Production Equipment | Beaver Creek WTP Generator | 75,124.67 |
| 323000000 | Power Production Equipment | I-95 Crossover Booster Station | 238,680.00 |
| 323000000 | Power Production Equipment | Llangollen generator | 100,000.00 |
| 323000000 | Power Production Equipment Total | | 473,804.67 |
| 323000000 | Total | | 473,804.67 |
| 325000000 | Electric Pumping Equipment | 1700 gpm Portable Pump | 120,000.00 |
| 325000000 | Electric Pumping Equipment | Barkers Landing VFD Replacemen | 10,000.00 |
| 325000000 | Electric Pumping Equipment | Beaver Creek Booster Pump Repl | 10,692.57 |
| 325000000 | Electric Pumping Equipment | Ingram Village Ph. 1 Treatment | 0.09 |

| Row Labels | Name | Project Description | Sum of Estimates2 |
|-------------------------|--|--------------------------------|---------------------|
| 325000000 | Electric Pumping Equipment | Old County Rd Well #2 VFD Repl | 3,804.60 |
| 325000000 | Electric Pumping Equipment | S Bethany VFD replacement ph 2 | 35,815.69 |
| 325000000 | Electric Pumping Equipment | South Heald Street Interconnec | 9,600.00 |
| 325000000 | Electric Pumping Equipment | VFD Replacements | 50,000.00 |
| 325000000 | Electric Pumping Equipment Total | | 239,912.95 |
| 325000000 Total | | | 239,912.95 |
| 3250010000 | Submersible Pump | 2013 Pump Replacements | 146,000.00 |
| 3250010000 | Submersible Pump | Choptank Well Investigation | 62,700.00 |
| 3250010000 | Submersible Pump | Jefferson Farms Well 2 Replace | 28,748.90 |
| 3250010000 | Submersible Pump Total | | 237,448.90 |
| 3250010000 Total | | | 237,448.90 |
| 3310000000 | Struct & Improves-Trtmt Plant | 2013 Station Improvements | 205,206.11 |
| 3310000000 | Struct & Improves-Trtmt Plant | AWC Internal Engineering 2012 | 682,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | BAYVILLE AERATOR WALKWAY | 82,271.10 |
| 3310000000 | Struct & Improves-Trtmt Plant | Castle Hills Station Upgrades | 1,164,488.95 |
| 3310000000 | Struct & Improves-Trtmt Plant | DCC #2 WTP Piping | 10,521.41 |
| 3310000000 | Struct & Improves-Trtmt Plant | Fairwinds Grounding Grid | 44,450.75 |
| 3310000000 | Struct & Improves-Trtmt Plant | Glendale Grounding Grid | 37,279.71 |
| 3310000000 | Struct & Improves-Trtmt Plant | Ingram Village Ph. 1 Treatment | 125,045.54 |
| 3310000000 | Struct & Improves-Trtmt Plant | Llangollen 1.4-Dioxane | 3,028,859.62 |
| 3310000000 | Struct & Improves-Trtmt Plant | Llangollen Radium Prlmnry Eng | 4,360.51 |
| 3310000000 | Struct & Improves-Trtmt Plant | Old County Road - Doors | 23,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | Old County Road - Driveway to | 18,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | Old County Road - Sidewalks | 7,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | Old County Road - Well Roof an | 33,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | PRV Data Aquisition | 50,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | South Ops Surge Protection | 10,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | Stonefield Plant Operation | 1,913.90 |
| 3310000000 | Struct & Improves-Trtmt Plant | Stonefield WTP Fluoride | 21,845.45 |
| 3310000000 | Struct & Improves-Trtmt Plant | Thomas Cove MOVs | 50,000.00 |
| 3310000000 | Struct & Improves-Trtmt Plant | Thomas Cove WTP Fluoride | 13,076.97 |
| 3310000000 | Struct & Improves-Trtmt Plant | Tuxedo Park Priv.Utility Poles | 12,329.86 |
| 3310000000 | Struct & Improves-Trtmt Plant Total | | 5,624,649.88 |
| 3310000000 Total | | | 5,624,649.88 |
| 3320000000 | Water Treat Equip-Purification | Bayview Analyzers | 15,000.00 |
| 3320000000 | Water Treat Equip-Purification | Bayville Sludge Management | 200,000.00 |
| 3320000000 | Water Treat Equip-Purification | Ingram Village Ph. 1 Treatment | 2,943.08 |
| 3320000000 | Water Treat Equip-Purification | Llangollen 1.4-Dioxane | 873,417.67 |
| 3320000000 | Water Treat Equip-Purification | Midvale Analyzers | 20,000.00 |
| 3320000000 | Water Treat Equip-Purification Total | | 1,111,360.75 |
| 3320000000 Total | | | 1,111,360.75 |
| 3420000000 | Dist Reservs,Tanks,Stantpipes | 2013 Tank Improvements | 45,000.00 |
| 3420000000 | Dist Reservs,Tanks,Stantpipes Total | | 45,000.00 |
| 3420000000 Total | | | 45,000.00 |
| 3430000000 | Transm & Distri Mains | Batson Creek, Phase 1 | 125,252.27 |
| 3430000000 | Transm & Distri Mains | Bayberry North, Phase 2A | 187,504.51 |

| Row Labels | Name | Project Description | Sum of Estimates2 |
|-------------------|-----------------------------|--------------------------------|----------------------|
| 3430000000 | Transm & Distri Mains | Bayberry North, Phase 3A | 19,466.28 |
| 3430000000 | Transm & Distri Mains | Bayberry North, Phase 8A | 60,712.99 |
| 3430000000 | Transm & Distri Mains | Bayberry South - Offsite Main | 640.80 |
| 3430000000 | Transm & Distri Mains | Bayberry South to Commodore 2 | 210,094.46 |
| 3430000000 | Transm & Distri Mains | Bayberry South, Phase 7 | 297,528.00 |
| 3430000000 | Transm & Distri Mains | Bayberry-AWC Funded Materials | 50,000.00 |
| 3430000000 | Transm & Distri Mains | Bowlerama Renewal | 435,392.82 |
| 3430000000 | Transm & Distri Mains | BR1-665 over Baylor Blvd | 75,885.64 |
| 3430000000 | Transm & Distri Mains | Brookmeade I 2014 | 460,657.43 |
| 3430000000 | Transm & Distri Mains | Canal View at Crossland Phse 3 | 102,063.40 |
| 3430000000 | Transm & Distri Mains | Cedar Lane, Phase 1 | 80,537.75 |
| 3430000000 | Transm & Distri Mains | Christiana Mall to Continenal | 1,100,000.00 |
| 3430000000 | Transm & Distri Mains | Collins Park 2014 | 785,771.10 |
| 3430000000 | Transm & Distri Mains | DelPark Manor 2014 | 717,000.00 |
| 3430000000 | Transm & Distri Mains | East Minquadale 2014 | 400,000.00 |
| 3430000000 | Transm & Distri Mains | Howell School Rd SR896 to SR71 | 485,527.57 |
| 3430000000 | Transm & Distri Mains | I-95 Crossover Main Extension | 97,363.02 |
| 3430000000 | Transm & Distri Mains | Klair Estates Open Cut | 14.83 |
| 3430000000 | Transm & Distri Mains | Manette Heights C&L | 225,000.00 |
| 3430000000 | Transm & Distri Mains | Newport Gap Pike 2014 | 337,319.93 |
| 3430000000 | Transm & Distri Mains | Odessa Woods Off-Site Main | 50,000.00 |
| 3430000000 | Transm & Distri Mains | Preserve at Robinson Farm-Ph1A | 0.01 |
| 3430000000 | Transm & Distri Mains | Res. @ Chestnut Rdge Sec3Ph3 | - |
| 3430000000 | Transm & Distri Mains | Richardson Park 2014 | 806,374.71 |
| 3430000000 | Transm & Distri Mains | Rt 273 to Christiana Mall | 1,350,000.00 |
| 3430000000 | Transm & Distri Mains | Sheffield Manor Bridge Xing | 200,000.00 |
| 3430000000 | Transm & Distri Mains | SR7, Skyline Drive | 75,376.61 |
| 3430000000 | Transm & Distri Mains | Stonewater Creek, Phase 6.1 | 107,565.71 |
| 3430000000 | Transm & Distri Mains | Swanwyck Estates 2014 | 275,096.37 |
| 3430000000 | Transm & Distri Mains | T&D Valve Replacement | 40,000.00 |
| 3430000000 | Transm & Distri Mains | Townsend Village II, Phase 4 | 27,532.70 |
| 3430000000 | Transm & Distri Mains | Traditions at Pike Creek | 171.40 |
| 3430000000 | Transm & Distri Mains | Tybrook Valves 2014 | 15,000.00 |
| 3430000000 | Transm & Distri Mains | US301, Levels Rd to Summit | 376,513.15 |
| 3430000000 | Transm & Distri Mains | Valley Road Ped Improvements | 6,259.03 |
| 3430000000 | Transm & Distri Mains | Valve Adjust DeIDOT 2013 | 4,750.00 |
| 3430000000 | Transm & Distri Mains | Vilone Village 2013 | 833,620.99 |
| 3430000000 | Transm & Distri Mains | Waters Run Off-site | 323,423.69 |
| 3430000000 | Transm & Distri Mains | Windsor Commons, Phase 1A & 1B | 182,950.35 |
| 3430000000 | Transm & Distri Mains | Windsor South, Phase 1 | 80,455.72 |
| 3430000000 | Transm & Distri Mains Total | | 11,008,823.24 |
| 3430000000 | Total | | 11,008,823.24 |
| 3450000000 | Services (Old) | Batson Creek, Phase 1 | 26,784.00 |
| 3450000000 | Services (Old) | Bayberry North, Phase 2A | 33,940.51 |
| 3450000000 | Services (Old) | Bayberry North, Phase 3A | 24,092.08 |
| 3450000000 | Services (Old) | Bayberry North, Phase 8A | 24,476.26 |

| Row Labels | Name | Project Description | Sum of Estimates2 |
|-------------------|---------------------------|--------------------------------|-------------------|
| 3450000000 | Services (Old) | Bayberry South, Phase 7 | 31,442.02 |
| 3450000000 | Services (Old) | Canal View at Crossland Phse 3 | 26,996.33 |
| 3450000000 | Services (Old) | Cedar Lane, Phase 1 | 8,121.60 |
| 3450000000 | Services (Old) | Directionally Drilled Services | 10,000.00 |
| 3450000000 | Services (Old) | Hampton Suites - 8" Service | 1,500.00 |
| 3450000000 | Services (Old) | Small Services 2013 | 225,000.00 |
| 3450000000 | Services (Old) | Stonewater Creek, Phase 6.1 | 12,963.91 |
| 3450000000 | Services (Old) | T&D Service Replacement | 20,000.00 |
| 3450000000 | Services (Old) | Townsend Village II, Phase 4 | 7,706.66 |
| 3450000000 | Services (Old) | Uniqema - 8-inch Service | 565.83 |
| 3450000000 | Services (Old) | Vilone Village 2013 | 45,357.30 |
| 3450000000 | Services (Old) | Windsor Commons, Phase 1A & 1B | 33,954.18 |
| 3450000000 | Services (Old) | Windsor South, Phase 1 | 9,524.47 |
| 3450000000 | Services (Old) Total | | 542,425.15 |
| 3450000000 | Total | | 542,425.15 |
| 3460000000 | Meters | ERT Change Outs | 76,000.00 |
| 3460000000 | Meters | Klair Estates Open Cut | 60.62 |
| 3460000000 | Meters | Misc Meter Pits Sussex 2013 | 48,000.00 |
| 3460000000 | Meters | New Meters for New Constr | 76,000.00 |
| 3460000000 | Meters | Periodic Meter Change Outs | 675,000.00 |
| 3460000000 | Meters | South Heald Street Interconnec | 2,565.79 |
| 3460000000 | Meters | Station Meter Changeouts | 112,000.00 |
| 3460000000 | Meters Total | | 989,626.41 |
| 3460000000 | Total | | 989,626.41 |
| 3480000000 | Hydrants (Fire) | 130 Hampden Rd Hydrant | 969.94 |
| 3480000000 | Hydrants (Fire) | Batson Creek, Phase 1 | 16,516.39 |
| 3480000000 | Hydrants (Fire) | Bayberry North, Phase 2A | 21,096.89 |
| 3480000000 | Hydrants (Fire) | Bayberry North, Phase 3A | 4,123.79 |
| 3480000000 | Hydrants (Fire) | Bayberry North, Phase 8A | 8,144.39 |
| 3480000000 | Hydrants (Fire) | Bayberry South, Phase 7 | 15,256.07 |
| 3480000000 | Hydrants (Fire) | Canal View at Crossland Phse 3 | 11,652.64 |
| 3480000000 | Hydrants (Fire) | Cedar Lane, Phase 1 | 8,213.79 |
| 3480000000 | Hydrants (Fire) | Stonewater Creek, Phase 6.1 | 8,269.59 |
| 3480000000 | Hydrants (Fire) | T&D Hydrant Replacements | 20,000.00 |
| 3480000000 | Hydrants (Fire) | Townsend Village II, Phase 4 | 3,639.13 |
| 3480000000 | Hydrants (Fire) | Vilone Village 2013 | 20,258.65 |
| 3480000000 | Hydrants (Fire) | Waters Run Off-site | 12,631.98 |
| 3480000000 | Hydrants (Fire) | Windsor Commons, Phase 1A & 1B | 17,219.58 |
| 3480000000 | Hydrants (Fire) | Windsor South, Phase 1 | 8,389.19 |
| 3480000000 | Hydrants (Fire) Total | | 176,382.02 |
| 3480000000 | Total | | 176,382.02 |
| 3900000000 | Office & Warehouse Bldgs. | Best Locks for AWC & Stations | 10,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | Blacktop for Lower yard at AWC | 25,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | Chemical Building Improvements | 50,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | Entrance Sign | 50,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | new entry sign @ 664 | 13,265.54 |

| Row Labels | Name | Project Description | Sum of Estimates2 |
|-------------------------|--------------------------------------|--------------------------------|-------------------|
| 3900000000 | Office & Warehouse Bldgs. | Office and Building Improvemen | 15,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | Renovations - Design/Plans | 8,000.00 |
| 3900000000 | Office & Warehouse Bldgs. | Sussex Office - Security Upgra | 20,000.00 |
| 3900000000 | Office & Warehouse Bldgs. Total | | 191,265.54 |
| 3900000000 Total | | | 191,265.54 |
| 3910000000 | Office Furniture | Furniture and Fixtures | 12,000.00 |
| 3910000000 | Office Furniture Total | | 12,000.00 |
| 3910000000 Total | | | 12,000.00 |
| 3910010000 | Office Equipment | Office Equipment | 8,000.00 |
| 3910010000 | Office Equipment Total | | 8,000.00 |
| 3910010000 Total | | | 8,000.00 |
| 3910020000 | Office Equip-Microcomp Hardwr | Corporate Automation 2012 | 160,000.00 |
| 3910020000 | Office Equip-Microcomp Hardwr | Hardware/Softw for Operations | 10,000.00 |
| 3910020000 | Office Equip-Microcomp Hardwr | Repl Equip Retire Auto 2012 | 94,000.00 |
| 3910020000 | Office Equip-Microcomp Hardwr | System Auto for New Hires 2012 | 29,000.00 |
| 3910020000 | Office Equip-Microcomp Hardwr Total | | 293,000.00 |
| 3910020000 Total | | | 293,000.00 |
| 3910040000 | Office Equip-Computer Software | Asset Management System - 2012 | 20,000.00 |
| 3910040000 | Office Equip-Computer Software | Budget Software | 50,000.00 |
| 3910040000 | Office Equip-Computer Software | DataStream Upgrade | 30,000.00 |
| 3910040000 | Office Equip-Computer Software Total | | 100,000.00 |
| 3910040000 Total | | | 100,000.00 |
| 3910070000 | Office Equip-Comp-PeopleSoft | CIS Soft w/Implent Contingency | 245,000.00 |
| 3910070000 | Office Equip-Comp-PeopleSoft | CIS Software Phase 1 | 31,500.00 |
| 3910070000 | Office Equip-Comp-PeopleSoft | CIS Software w/Implementation | 542,759.16 |
| 3910070000 | Office Equip-Comp-PeopleSoft | Misc IT capitalize payroll | 100,000.00 |
| 3910070000 | Office Equip-Comp-PeopleSoft Total | | 919,259.16 |
| 3910070000 Total | | | 919,259.16 |
| 3910080000 | Office Equip-Comp-GIS System | Geographic Information System | 20,000.00 |
| 3910080000 | Office Equip-Comp-GIS System Total | | 20,000.00 |
| 3910080000 Total | | | 20,000.00 |
| 3920000000 | Trans Equip (Cars-Trucks) | Bucket Truck | 200,000.00 |
| 3920000000 | Trans Equip (Cars-Trucks) | Emergency Lights | 5,000.00 |
| 3920000000 | Trans Equip (Cars-Trucks) | Transportation Purchases | 750,000.00 |
| 3920000000 | Trans Equip (Cars-Trucks) Total | | 955,000.00 |
| 3920000000 Total | | | 955,000.00 |
| 3940000000 | Tools Shop & Garage Equip | Misc Meter Shop Equipment | 7,000.00 |
| 3940000000 | Tools Shop & Garage Equip | MISC SHOP TOOLS | 4,000.00 |
| 3940000000 | Tools Shop & Garage Equip | Misc T&D Tools | 20,000.00 |
| 3940000000 | Tools Shop & Garage Equip | Tools - Facilities Maintainenc | 15,000.00 |
| 3940000000 | Tools Shop & Garage Equip | Water Quality Tools | 1,500.00 |
| 3940000000 | Tools Shop & Garage Equip Total | | 47,500.00 |
| 3940000000 Total | | | 47,500.00 |
| 3950000000 | Laboratory Equipment | 2012 General Laboratory Equip | 10,000.00 |
| 3950000000 | Laboratory Equipment | Chemical Analyzer | 7,500.00 |
| 3950000000 | Laboratory Equipment Total | | 17,500.00 |

| Row Labels | Name | Project Description | Sum of Estimates2 |
|-------------------------|-------------------------------|--------------------------------|----------------------|
| 150000000 Total | | | 17,500.00 |
| 3970000000 | Communication Equipment | 3 Mobile Radios (did 125 orgin | 3,000.00 |
| 3970000000 | Communication Equipment | 5 Portable Radios | 5,000.00 |
| 3970000000 | Communication Equipment | Bayview Automation Controls | 30,000.00 |
| 3970000000 | Communication Equipment | Chesapeake City Intercon Auto | 15,000.00 |
| 3970000000 | Communication Equipment | Comm system improvements | 25,000.00 |
| 3970000000 | Communication Equipment | Control System Replacement | 50,000.00 |
| 3970000000 | Communication Equipment | Generators at radio repeaters | 30,000.00 |
| 3970000000 | Communication Equipment | Middletown Intercon Automation | 50,000.00 |
| 3970000000 | Communication Equipment | Midvale Automation Controls | 50,000.00 |
| 3970000000 | Communication Equipment | Miscellaneous Purchases (Radio | 6,000.00 |
| 3970000000 | Communication Equipment | Roseville Park Auto Improvemen | 50,000.00 |
| 3970000000 | Communication Equipment Total | | 314,000.00 |
| 3970000000 Total | | | 314,000.00 |
| 3980000000 | Misc. Equipment | 2013 Well Monitoring Equipment | 10,000.00 |
| 3980000000 | Misc. Equipment | Misc Safety Equipment | 18,800.00 |
| 3980000000 | Misc. Equipment | Misc Security Equipment | 5,000.00 |
| 3980000000 | Misc. Equipment | Monitoring Equipment | 10,000.00 |
| 3980000000 | Misc. Equipment | New Employee Photo Identificat | 25,000.00 |
| 3980000000 | Misc. Equipment | New security specialist positi | 10,000.00 |
| 3980000000 | Misc. Equipment | Planning Dept Survey Equipment | 5,000.00 |
| 3980000000 | Misc. Equipment | Portable Remote Surveillance | 10,000.00 |
| 3980000000 | Misc. Equipment | Ready Key System in 664 Buildi | 30,000.00 |
| 3980000000 | Misc. Equipment | S Bethany Confined Space Acces | 1,483.51 |
| 3980000000 | Misc. Equipment | South Ops Emergency Lights | 10,000.00 |
| 3980000000 | Misc. Equipment Total | | 135,283.51 |
| 3980000000 Total | | | 135,283.51 |
| Grand Total | | | 26,625,823.63 |