2019

How Long Island Water Suppliers Plan to Reduce Peak Water Demand

Water for Long Island

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Water for Long Island Report
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November 2019

Background History

In 1978, the U.S. Environmental Protection Agency (EPA) designated Long Island's aquifer system a "Sole Source Aquifer," because of the Island's total dependence upon groundwater for its drinking water supply. The conservation of this vital natural resource continues to be crucial to the future of Long Island.

In its letter dated January 5, 2016, the NYS Department of Environmental Conservation (DEC) stated that, based upon the Department's review of the groundwater pumped in 2015, it found "… both Nassau and Suffolk County … exceeded the safe yields cited in the *1986 L.I. Groundwater Management Plan*." As a direct result this analysis – and the Department's salient purpose for the letter – the DEC directed each Long Island public water supplier to develop a plan to **reduce peak seasonal water demand** (i.e., summer water demand) **by 15% over the next 3 to 4 years**. The letter also directed the water suppliers to submit annual progress reports on the Department's Water Conservation Annual Reporting Form, which was revised specifically for this purpose. The letter directed each supplier to submit a completed Reporting Form or an initial Water Conservation Plan to the Department by April 28, 2017.[1] (Refer to Appendix A for the DEC's entire letter.)

This *Water for Long Island* (WFLI) Report summarizes the plans submitted by Long Island's water suppliers[2] and the progress they have made in executing them between January 2016 and the April 28, 2017 deadline date. It is based on information obtained by way of a Freedom of Information Act (FOIA) request submitted to the DEC. Out of the 54 public water suppliers in Nassau County, plans and progress reports for 30 suppliers are included in this Report. For Suffolk County, of the 15 major suppliers, the plans and progress reports for 8 suppliers are similarly included.

Putting this program in context: In 1987, the DEC established an annual and a five-year running cap on the amount of water each Nassau County water supplier could pump from their individual wells. Some suppliers indicated in their annual reporting to DEC whether the amount of water they pumped for the year was over or under the respective five-year running cap. For the year 2016, this information is disclosed in Table 1.

[1] In order to comply with New York State Codes, Rules and Regulations Title 6 Chapter V Part 601.10, water suppliers must submit a "Water Conservation Annual Reporting Form." In order to encourage groundwater conservation and preserve Long Island's Sole Source Aquifer, DEC revised this Form to track each supplier's plan and progress to reduce its peak season water demand by 15% over the next 3 to 4 years starting in 2016 from the amount the supplier pumped during 2012. The *Water Conservation Manual for Development of a Water Conservation Plan*, which was distributed by the New York State DEC Division of Water, was used as a guide by suppliers in preparing their conservation programs.

[2] There are four types of public water suppliers on Long Island: water districts; municipal water departments; water authorities; and for-profit, investor-owned water companies.

Infrastructure

The format for the 2016 water reporting by the water suppliers varied and was not consistent among all the suppliers. In general, however, they all included water infrastructure information such as:

- Number of wells in service
- Capacity of standby generation to keep water infrastructure operating in blackouts
- Interconnections to other services, which can be opened in case of emergency
- Description of the water mains: how many miles of mains exist and how old they are
- Number of fire hydrants
- Descriptions of the water meters in use and their maintenance schedule
- Plans and progress for leak detection surveys for water mains
- Treatment of water
    - Disinfecting agent such as calcium hypochlorite
    - pH adjustment using agent such as hydrated lime or NaOH
    - Corrosion control using agent such as sodium hexametaphosphates or caustic soda
    - Some districts treat for iron sequestration and corrosion control using agent such as polyphosphate
    - Some districts indicated if they had wells which required additional treatment for removal of VOCs (volatile organic compounds) or nitrates.

Non-Revenue Water

Water system reports to the DEC also quantify "non-revenue water" (also referred to as "unaccounted for" water), which is the difference between the total amount of water pumped at the wellheads and the amount that is billed to customers. It is a measure of how efficient a system is in delivering water to a supplier's customers. The American Water Works Association Leak Detection and Accountability Committee noted that the **benchmark for non-revenue water is 10 percent**.

Data for non-revenue water are presented in Table 1. Water districts described their plans to minimize their non-revenue water in their reports to the DEC.

Non-revenue water includes apparent losses and real losses. Apparent losses can result from meter inaccuracies and data entry errors. Delivery efficiency can be increased by minimizing real losses. Real losses can result from:

- Problems, including but not limited to:
    - Leaks in the distribution system at pipes, valves and hydrants
    - Overflow of storage tanks
    - Unauthorized consumption
    - Unauthorized use of fire hydrants
- Maintenance requirements, including but not limited to:
    - Make-up water for chemicals used in water treatment
    - Blowoff (water discarded to remove turbidity and air when a well starts up)
    - Water running through continuous analyzers (that keep track of water quality)
    - Flushing of water mains and fire hydrants
- Firefighting training and operations

Reducing Water Consumption

Prompt leak detection, repair and other forms of waste mitigation are important components for reducing real losses. With upgraded technology, most suppliers can now survey water mains for leaks, and have arrangements in place to have them repaired quickly. On the other hand, old meters are less likely to detect leaks, in particular under low-flow conditions. An indication of the amount of infrastructure each supplier must maintain is given by the miles of water main data in Table 2.

Most water suppliers have installed, or are in the process of installing, upgraded meters with greater capabilities. State of the art capabilities, called **Automated Metering Infrastructure** (AMI) or **Automated Meter Reading** (AMR), include a transmitter, which can be read remotely. Upgraded meters also provide the following advantages:

- Overall accuracy is improved, especially at low-flow rates, where old meter readings frequently underestimate consumption (a real loss reduction).
- Meter reading and data recording errors are substantially reduced (an apparent loss reduction).
- Meters can be read more frequently.

The new technology can also compare water usage at a location during identical time periods throughout its service history. Abnormally high consumption during one of these periods may indicate a leak, while abnormally low consumption may indicate a malfunctioning meter. Districts with receivers tied directly to their billing systems can detect leaks much more rapidly. Several water suppliers notify customers of suspected leaks if their meters indicate that water flowed for 24 hours. However, leaks are more difficult to detect in large dwellings or buildings, such as apartment complexes or hospitals, because, even at off-hours, water consumption virtually never stops. The new technology can also detect irrigation systems that operate outside of permitted schedules or during rain events. Several water suppliers issue violation notices for these types of infractions.

A few water supply systems are offering *EyeOnWater*, a tool which allows users to access their water consumption data quickly, which should facilitate leak detection and expedite repair as well.

Finally, many fire districts plan to minimize the water they use in their firefighter training.

Rate Structures

Nearly all water suppliers in Nassau County, and, starting in 2019, the Suffolk County Water Authority (SCWA), use a water pricing schedule, typically referred to as a **tiered rate structure**, that charges higher amounts for a given quantity of water as consumption increases. This is an effective tool for promoting water conservation.

Note: rate structure information has been intentionally excluded from this Report because many water suppliers are planning to review their current rate structures; and WFLI did not want to include outdated information. It is expected most districts, that do not already have a tiered rate structure, will adopt one in the near future to promote conservation.

The Suffolk County Water Authority's 2016 report to the DEC discussed two other rate structures which could be implemented to promote conservation:

- A seasonal rate structure, in which a higher price per gallon is charged during the five warm weather months. (Seasonal consumption is discussed below under irrigation).
- An allocation based rate structure in which customers have a base usage amount assigned to them; and a higher price is charged for usage exceeding their base amount.

Top Ten Users

The DEC requested all Long Island water suppliers to identify the top ten water users in their districts. Data on the top user in each water district, the quantity of water that the user consumed, and the percentage of total water consumed in each district by its top ten users are presented in Table 3. Water suppliers are contacting their top ten users to offer water audits and advice on how to lower their consumption.

Per Capita Water Consumption

Data showing the *per capita* water consumption in each water district are presented in Table 4. According to a US Geological Survey publication, daily water consumption in the United States in 2010 was 89 gallons per capita (*Estimated Use of Water in the United States in 2010*, U.S. Geological Survey Circular 1405, 2014, https://pubs.usgs.gov/circ/1405/pdf/circ1405.pdf). The data in Table 4 demonstrate that *per capita* consumption in most water systems on Long Island is higher than the national average.

Irrigation

Water usage during the cold weather months on Long Island is often considered a district's consumption baseline, representing – for the most part – indoor water consumption only. The aquifers and water infrastructure systems are most stressed during the warm weather months, when most water suppliers see a significant increase in water consumption, generally attributed to summer irrigation needs. The five warm weather months are: May, June, July, August and September. The cold weather months are the remaining seven. Table 5 shows that groundwater pumpage on Long Island, during the warm weather months, is consistently higher than during the cold weather months, frequently by a factor of 2 to 3 times, and sometimes much more. Water is wasted when lawns are over-irrigated, which is when irrigation systems continue to operate during rainstorms, or when the soil already contains sufficient moisture; or when landscaping includes grasses and plants that require frequent watering. The Suffolk County Water Authority noted in its 2016 report that groundwater pumpage during January was typically about 25,000 gal/min. On hot, dry days in July, SCWA pre-dawn groundwater pumpage can exceed 500,000 gal/min – twenty-times the January pumpage. **Therefore, the most effective way to conserve water on Long Island is to reduce the water used for irrigation.**

Nassau County passed its first Water Conservation Ordinance No. 248-A-1987 in 1987, and amended it with Ordinance No. 181-2016 in 2016. The 1987 Ordinance prohibits hosing driveways and sidewalks. It restricts the days on which establishments may irrigate (based on street address to match the odd or even calendar day). To minimize evaporation loss, it further prohibits irrigation between the hours of 10 am and 4 pm. The amended Ordinance requires that technology be installed on automated irrigation systems to prevent operation during periods of adequate moisture. Such technology may consist of a rain sensor, moisture detector or "smart controller," which can assess weather, soil and

related conditions to determine if and when irrigation is required. The use of smart controllers can reduce irrigation by as much as 25%. Users should note that their irrigation systems must be inspected annually.

According to Cornell Cooperative Extension (CCE) guidelines, as noted in reports prepared by H2M Engineering Consultants, Long Island residents over-water their lawns. If the two Nassau County Ordinances could be modified to be consistent with the CCE guidelines, further reductions in groundwater consumption might be achieved.

Another way to reduce wasteful consumption is by use of landscaping with vegetation that requires little irrigation, such as xeriscape. Landscaping with plants and grasses that are drought-tolerant, and avoiding others that require significant irrigation (e.g., such as bluegrass), can also reduce consumption. For other examples, see Table 8, which discloses the irrigation required for different grass varieties. Some water suppliers are now including language in their "letters of water availability"[3] to encourage landscaping that requires little irrigation in new developments, and water suppliers are making lists of xeriscape plants available to customers and contractors. Sands Point recommends using drip irrigation to reduce water consumption; the Village of Old Westbury restricts irrigation to 20% of the first three acres of property, and to 10% of the remaining acreage.

The Riverhead Water District noted many of its homes stand on former farmland, where there are few large trees; and, therefore, not much shade is available. The lack of shade tends to hasten evaporation and, hence, increase the "need" for irrigation.

Commercial Usage versus Residential Usage

A comparison of the water consumption by Long Island's residential customers versus its commercial customers is disclosed in Table 6. This table demonstrates that Long Island's consumption is, by far, due to residential users. **Therefore, the Island's residential population will have to be vigilant about water conservation and protection, and proactively participate in such efforts if they are to be successful.**

Reducing Indoor Water Consumption

Table 7 provides revealing insight into how much water can be saved by upgrading from old high-flow toilets and appliances to water-efficient technology in the home. For many homes, the installation of low-flow toilets provides the best opportunity for significantly reducing indoor water consumption.

The Village of Hempstead has a more urban character than most other Nassau County areas. There are a number of large apartment buildings in the Village. Consequently, peak demand does not occur during hours typically associated with irrigation, but rather during breakfast and dinner hours, which is consistent with the Village being thought of as a "bedroom community."

Another benefit of employing AMI and AMR technology is much faster indoor leak detection. Some water suppliers offer a free home inspection program to detect leaks. Others offer kits for reducing indoor consumption containing items such as faucet aerators, toilet and shower retrofits, toilet

[3] A "letter of water availability" is a letter from a water supplier to an applicant who is applying for water for a new or updated project, which indicates that the supplier has a sufficient water supply to meet the needs of the project. It is used as a commitment from the supplier to serve the new development.

tank displacement bags and dye tablets for toilet leak detection. The Water Authority of Great Neck North (WAGNN) offers a low-flow showerhead exchange program, and the Bethpage Water District is in the process of procuring water-activated timers for encouraging customers to reduce the duration of their showers.

The Environmental Protection Agency (EPA) *WaterSense* program (www.epa.gov/watersense) provides information which can assist customers in locating and acquiring water saving devices. To qualify for the *WaterSense* label, a product must be EPA-certified as being at least 20% more efficient without sacrificing performance. By supplying information about this program, water districts can encourage customers to switch to water-efficient devices. Water suppliers can also encourage the use of the U.S. Green Buildings Council Leadership in Energy and Environmental Design (LEED) rating system for new developments.

Summer Residency

There are some "summer places" on Long Island, where the increase in water consumption can be attributed to a returning population. Two such places are the City of Long Beach in Nassau County and the Hampton Bays in Suffolk. The increase in groundwater pumpage in Long Beach during the warm weather months is attributable directly to its returning "snow-bird" population, rather than to irrigation, especially since many such returnees live in high-rise residences; and homeowner yards are usually small, requiring minimal irrigation. The Hampton Bays Water District estimates its population increases by 30 to 40 percent during the summer months. Water suppliers that see a substantial increase in population during the warm weather months may find it more difficult to achieve the peak season reductions in water consumption now being requested by the DEC.

Other Reasons for Conserving

Conserving water is prudent for reasons other than preserving the groundwater for future generations, as pumping and treating the resource requires expending a significant amount of energy and other resources. For example, consider these statistics disclosed by the Suffolk County Water Authority:

- In winter, the Authority can operate on fewer than 100 wells; but, in summer, over 500 additional wells are used to meet consumer demand. Therefore, most of SCWA's infrastructure exists only because of the increased summer demand (again, attributable mostly to irrigation).
- On an annual basis, the SCWA is the sixth largest consumer of electricity on Long Island; but, in summer, it is the second largest consumer. Thus, conserving water also helps conserve energy, as less demand for water will require less energy to pump and treat it.
- As noted previously in this Report, groundwater requires chemicals for disinfection and pH control before it is suitable for public consumption, but it often also requires additional treatment, such air stripping or Granular Activated Carbon technology, to remove chemical pollutants as well. Therefore, conserving water will also reduce treatment costs and, thereby, the cost of water production, as there will be less pumpage and, hence, less groundwater to treat.

Saltwater Intrusion

Both the Water Authority of Great Neck North (WAGNN) and the Village of Sands Point have indicated they have experienced problems attributable to saltwater intrusion. The WAGNN has already established three wells located off the Great Neck peninsula so their wells located on the peninsula, could have more time to rest to prevent further intrusion. Sands Point has already purchased water on an emergency basis from the Port Washington Water District, due to increased chloride readings resulting from saltwater intrusion at two of its wells. To solve this problem, the Village was considering taking two possible courses of action:

1. Drilling a new well in an area that has acceptable chloride levels to reduce the pumpage required from the two wells that have increased chloride levels; or
2. Drilling up to 20 private wells for pumping up to 40 GPD in areas that have acceptable chloride levels. This option would not reduce the overall pumpage; but it would spread out the withdrawal beyond the area most at risk from saltwater intrusion.

In addition, according to the USGS, a Lloyd Aquifer monitoring well in Long Beach has been recording chloride readings of 110 parts per million (ppm) since May of 2010. This is of concern as water is deemed unpotable at chloride concentrations greater than 250 ppm.

Population Growth

A growing Long Island population may make it more difficult for water conservation efforts to be successful. This is evidenced by the demographics and consumption trends experienced by the Water Authority of Great Neck North. In response to these trends, the WAGNN developed an aggressive conservation program; and avers it has been successful, as average daily demand, in gallons/day/service, has declined significantly since the early 1990s. However, because the number of customers they serve has increased by 4.5 percent over the last 10 years, the Authority's efforts have succeeded in stabilizing the district's average daily demand (at approximately 4.35 MGD). But their efforts since 2003 have not reduced total water use.

Emergencies

All water suppliers are required to have plans in place to cope with emergencies, such as droughts, vandalism or blackouts. A number of districts have implemented *Reverse 911* or *Swiftreach Networks, Inc*. (*Swift911*), so they can get information to customers quickly should an emergency arise.

Public Education Efforts Undertaken By Water Districts

The list that follows immediately below enumerates the public education efforts generally undertaken by Long Island's water suppliers. Nearly every water system has made efforts to advance the first four items; and most systems are making efforts to advance many of the others.

1. **Annual water quality report**
2. **Periodic newsletters**
3. **Bill stuffers**
4. **Brochures available at water system offices**
5. Water conservation kits available at water district offices

6. Information on water district websites, such as xeriscape information,***** irrigation guidelines, Nassau County water conservation ordinances, and links to the EPA *WaterSense* program.
7. Articles in local media.
8. Encourage and facilitate visits to water department facilities by school, youth and college groups.
9. Arrangements for scouts to obtain the Water Merit Badge.
10. Presentations at schools. School activities such as making posters.
11. Presentations at senior centers and civic groups.
12. Presence at community fairs.
13. Water conservation displays at public locations.
14. Water conservation hotlines.
15. Speaker's bureau.
16. ***** The Water Authority of Great Neck North has created a xeriscape
17. Suffolk County Water Authority has implemented the following measures:
    - A water footprint calculator is available on the SCWA website
    - A new position, chief sustainability officer, has been created
    - The *East End Water Wise Club* was created. Customers in the East End can apply for a $50 credit on their accounts, which can be used to purchase low-flow fixtures and/or rain sensors.

In conclusion, the above reporting and the first seven Tables below provide a progress report on the efforts advanced by public water suppliers to comply with the DEC's 2016 directive to reduce their district's peak water consumption on Long Island. *Water for Long Island* hopes additional progress has been made in the 2-1/2 years since the DEC first issued the directive and the reporting forms – revised specifically for reporting directive compliance – were first submitted to the Department in early 2017. It should be noted most of the information cited in this report is based upon on the information disclosed on those forms. WFLI will request copies of supplier reports submitted to DEC since 2017; and will continue to monitor and assess their future efforts and related progress toward complying with the Department's directive.

The following Tables are provided for additional details in this Report.

Table 1: Non-Revenue Water and Five-Year Running Pumpage Cap
Table 2: Miles of Water Main for Water Suppliers
Table 3: Top Water User and Percent Consumption by Top Ten Users in Each District
Table 4: The Average Daily Per Capita Water Consumption (Year 2016 Unless Otherwise Indicated)
Table 5A: Comparison of Warm Weather Months and Cold Weather Months* Pumpage
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Table 6: Comparison of Residential and Commercial Annual Water Consumption
Table 7: Typical Potential for Saving Water by Use of Household Appliances Designed to Reduce Water Consumption
Table 8: Lawn Watering Requirements
Appendix A: DEC Letter to Long Island Water Suppliers, January 5, 2016.
November 2019

Table 1. Non-Revenue Water and Five-Year Running Pumpage Cap		
Water Authority or Water District	**Non-Revenue Water (%)***	**Above Five-Year Running Pumpage Cap?**
Nassau County		
Albertson WD	16.0	
Village of Bayville	10.5	no
Carle Place WD	N/A	
Bethpage WD	11.5	yes
Village of Farmingdale	5.0	no
Franklin Square WD	15.9	yes
Village of Garden City	9.5	yes
Garden City Park WD	9.0	yes
Glenwood Landing WD	9.3	
WA of Great Neck North	8.0	
Village of Hempstead	9.61	
Hicksville WD	14.5	no
Jericho WD	7.1	yes
Locust Valley	N/A	
City of Long Beach	15.8	no
Manhasset/Lakeville WD	8.5	no
Village of Mineola	14.0	
Massapequa WD	4.0	
Oyster Bay WD	9.8	yes
Plainview WD	1.4	no
Village of Plandome	8.0	
Port Washington WD	7.0	
Village of Rockville Centre	18.0	
Roslyn WD	7.7	no
Village of Sands Point	10.0	
Water Authority of Western Nassau (WAWNC)	11.0	
West Hempstead WD	9.98	
Westbury WD	9.0	no
Village of Williston Park	12.0	
Suffolk County		
Dix Hills WD	12.3	
Greenlawn WD	6.8	
Hampton Bays WD	7.0	
Riverhead WD	8.4	
South Huntington WD	12.3	
St James WD	3.0 (estimated)	
Suffolk County Water Authority	9.9 (2014)	

* The reporting year is 2016 unless otherwise indicated

Table 2. Miles of Water Mains	
District	
Nassau	**Miles of Water Mains**
Albertson WD	over 50
Bayville WD	30
Bethpage WD	110
Carle Place WD (2012)	35
Farmingdale WD	22
Franklin Square WD	41
Village of Garden City	104
Garden City Park WD	78
Glenwood Landing WD	4.3
WA of Great Neck North	over 117
Village of Hempstead	93
Hicksville WD	185
Jericho WD	365
Locust Valley WD (2012)	56
City of Long Beach	70
Manhasset-Lakeville WD	170
Massapequa WD	147
Mineola	52
Old Westbury WD	70
Oyster Bay WD	53
Plainview WD	130
Village of Plandome	9
Port Washington WD	110
Village of Rockville Centre	70
Roslyn WD	97
Village of Sands Point (2015)	36
Water Authority of Western Nassau County	234
West Hempstead WD	72
Village of Westbury (2015)	92
Williston Park WD	18
Suffolk	**Miles of Water Mains**
Dix Hills WD	170
Greenlawn WD	197
Hampton Bays WD	100
Town of Riverhead	235
Smithtown WD	84
South Huntington WD	270
St James WD	59
Suffolk County Water Authority	6,000

Table 3. Top Water User and Percent Consumption by Top Ten Users in Each District			
Water Authority or Water District	**Top Water User**	**Water Consumed in 2016 By That User (Gallons)**	**Percent Consumption by the Top Ten Users (%)**
Nassau			
Albertson WD	Holipark Estates	4,500,000	3.8
Village of Bayville	North Centre Island Property Owners	6,250,640	8.3
Bethpage WD	St Joseph Hospital	9,696,000	3.3
Carle Place	N/A	N/A	N/A
Village of Farmingdale	Republic National Holding Co.	5,946,013	8.3
Franklin Square WD	Varsha, Inc. (car wash)	9,085,000	5.8
Village of Garden City	N/A	N/A	N/A
Garden City Park WD	Five Corners Car Wash	5,069,000	2.5
Glenwood Landing WD	Swan Club	6,790,000	29.4
WA of Great Neck North	USMMA	12,847,648	4.0
Village of Hempstead	Jackson Prime Realty LLC	32,955,000	8.6
Hicksville WD	Kozy Shack, Inc.	26,215,000	5.5
Jericho WD	A laboratory complex identified only by account number.	48,875,000	3.3
Locust Valley WD	N/A	N/A	N/A
City of Long Beach	Grandell Rehabilitation and Nursing Center	9,432,280	8.0
Manhasset/Lakeville WD	North Shore Hospital	131,737,000	21.0
Massapequa WD	Southgate Homeowners Assoc	6,924,000	1.4
Village of Mineola	Winthrop University Hospital (Highest of several WUH accounts).	25,200,000	10.0
Old Westbury WD	SUNY Old Westbury	36,600,000	10.3
Oyster Bay WD	Town of Oyster Bay/Town Hall	6,129,000	7.9
Plainview WD	Somerset Gardens Senior Care	88,661,000	11.8
Village of Plandome	Plandome Country Club	1,898,000	N/A
Port Washington WD	St Francis Hospital	37,766,520	N/A
Village of Rockville Centre	Mercy Medical Center	23,525,000	N/A
Roslyn WD	Sunharbor Manor	13,930,000	5.3
Village of Sands Point	An irrigation user	1,130,000	N/A
Water Authority of Western Nassau (WAWNC)	Belmont Park, which also has its own wells for irrigation and welfare of the horses. WAWNC provides potable water.	N/A	N/A
West Hempstead WD	Amy Jiang (Laundromat)	10,340,000	3.4
Westbury WD	Kenilwort Equities	7,100,000	4.2

Village of Williston Park	Village of East Williston	127,700,000	5.2
Suffolk			
Dix Hills WD	USDAN Center for the Arts	14,312,000	4.0
Greenlawn WD	Gurwin Jewish Geriatric Center of LI	25,770,000	3.3
Hampton Bays WD	Garden Homes Management Corp	1,451,200	5.0
Riverhead WD	Stark Mobile Home Park	52,380,000	8.0
Smithtown WD	Avalon Gardens Rehab	62,409,974	13.3
South Huntington WD	Estee Lauder	37,334,000	5.8
St James WD	William Borella (residence)	7,871,788	6.4
Suffolk County Water Authority	Smithtown WD	863,402,839	N/A

Table 4. The Average Daily Per Capita Water Consumption (Year 2016 Unless Otherwise Indicated)	
District	**Average Per Capita Water Consumption Gallons Per Customer Per Day**
Nassau	
Albertson WD	136
Bayville WD	118
Bethpage WD	115
Carle Place WD (2012)	210
Farmingdale WD	110
Franklin Square WD	93
Village of Garden City	204
Garden City Park WD	181
Glenwood Landing WD	136
WA of Great Neck North	136
Village of Hempstead	94
Hicksville WD	124
Jericho WD	241
Locust Valley WD (2012)	210
City of Long Beach	70
Manhasset-Lakeville WD	140
Massapequa WD	131
Village of Mineola	128
Old Westbury WD	398
Oyster Bay WD	130
Plainview WD	158
Plandome WD	191
Port Washington	125
Village of Rockville Centre	142
Roslyn WD	168
Village of Sands Point (2015)	405 over 100 winter over 800 summer
WAWNC	78
Village of West Hempstead (2013)	103
Westbury WD (2015)	152
Village of Williston Park WD	101
Suffolk	
Dix Hills WD	129
Greenlawn WD	N/A
Hampton Bays	196
Riverhead	225
Smithtown WD	145
South Huntington	N/A
St James WD	155
Suffolk County Water Authority (2014)	466

Table 5A. Comparison of Warm Weather Months* and Cold Weather Months* Pumpage**			
Water Authority or Water District	**Average Warm Month Pumpage (MG)**	**Average Cold Month Pumpage (MG)**	**Ratio Warm Month Pumpage/ Cold Month Pumpage**
Nassau			
Albertson WD	N/A	N/A	N/A
Inc Village of Bayville	41.36	16.77	2.47
Bethpage WD	188.91	88.07	2.14
Village of Farmingdale	44.89	22.94	1.96
Franklin Square WD	88.41	52.69	1.68
Village of Garden City	219.84	106.14	2.07
Garden City Park WD	146.72	81.98	1.79
Hicksville WD	287.00	159.00	1.81
Jericho WD	766.89	239.28	3.20
City of Long Beach	105.19	72.47	1.45
Manhasset/Lakeville WD	310.60	137.14	2.26
Oyster Bay WD	56.95	24.49	2.33
Plainview WD	234.82	99.14	2.37
Roslyn WD	167.25	68.03	2.46
West Hempstead WD	130.73 (2000-2013)	81.77 (2000-2013)	1.60
Suffolk			
Dix Hills WD	321.86	84.38	3.81
Greenlawn WD	317.12	112.16	2.83
Hampton Bays WD	169.20	49.46	3.42
Riverhead WD	382.90 (2012-2016)	120.70 (2012-2016)	3.17
Smithtown WD	138.54	39.96	3.47
South Huntington WD	508.14	191.39	2.65
St James WD	99.56	28.90	3.44
Suffolk County Water Authority	9.09 (11/2013-10/2014)	3.54 (11/2013-10/2014)	2.57

Table 5B. Comparison of Warm Weather Months* and Cold Weather Months* Pumpage**			
Water Authority or Water District	**Daily Average Pumpage - Warm Months (MGD)**	**Daily Average Pumpage - Cold Months (MGD)**	**Ratio of Daily Averages Warm Month Pumpage/ Cold Month Pumpage**
Nassau			
Carle Place WD	2.889 (2012)	0.983 (2012)	2.94
Glenwood WD	0.247	0.094	2.63
WA of Great Neck North	6.295	3.050	2.06
Locust Valley WD	2.889 (2012)	0.983 (2012)	2.94
Massapequa WD	8.800	3.374	2.61
Village of Mineola	3.520	2.670	1.32
Village of Old Westbury	3.690	0.950	3.88
Village of Plandome	0.476	N/A	
Port Washington WD	5.620	2.880	1.95
Village of Rockville Centre	5.800	3.000	1.93
Village of Sands Point	2.100 (2015)	0.517(2015)	4.06
Water Authority of Western Nassau County	14.86	9.080	1.64
Westbury WD	4.200 (2015)	2.800 (2015)	1.50
Village of Williston Park	1.470	0.880	1.67

Table 5C. Comparison of Warm Weather Months* and Cold Weather Months* Seasonal Pumpage**			
Seasonal Pumpage (MG)	**Warm Weather (2016)**	**Cold Weather (2016)**	**Ratio**
Nassau			
Village of Hempstead	1,060	900	1.18

*Warm weather months: May, June, July, August & September; Cold weather months: January, February, March, April, October, November & December.

**Data is from year 2016 unless otherwise indicated.

Table 6. Comparison of Residential and Commercial Annual Water Consumption			
Water Supplier	**Residential consumption (thousands of gallons)**	**Commercial consumption (thousands of gallons)**	**Ratio Residential/ Commercial Pumpage**
Albertson WD	600,180	68,293	8.79
Village of Bayville	N/A	N/A	N/A
Bethpage WD	1,111,960	269,012	4.13
Carle Place WD (2012)	331,524	150,629	2.20
Farmingdale WD	223,935	64,806	3.46
Franklin Square WD	567,524	114,385	4.96
Village of Garden City	N/A	N/A	N/A
Garden City Park WD	945,911	124,932	7.57
Glenwood Landing WD	37,696	12,058	3.12
WA Great Neck North	1,093,019	106,190	10.3
Hempstead	N/A	N/A	N/A
Hicksville WD	1,720,636	407,752	4.22
Jericho WD	4,076,318	383,147	10.6
Locust Valley WD (2012)	521,354	54,615	9.55
City of Long Beach	566,821	302,655	1.87
Manhasset-Lakeville WD	1,311,105	889,948	1.47
Massapequa	1,843,367	125,079	14.7
Village of Mineola WD	461,000	327,000	1.41
Old Westbury WD	595,236	47,600	12.5
Oyster Bay WD	345,862	65,462	5.28
Plainview WD	1,417,891	405,112	3.50
Plandome	N/A	N/A	N/A
Port Washington	927,188	442,407	2.10
Village of Rockville Centre	814,000	260,000	3.13
Roslyn WD	926,417	217,785	4.24
Sands Point (2015)	412,335	1,950	211
WAWNC*	2,721,870	397,981	6.84
West Hempstead	N/A	N/A	N/A
Westbury Water District (2015)	960,000	180,000	5.33
Village of Williston Park WD	184,684	53,559	3.45
Suffolk			
Dix Hills WD	1,762,343	166,285	10.6
Greenlawn	N/A	N/A	N/A
Hampton Bays	N/A	N/A	N/A
Riverhead	1,907,664	724,449	2.63
South Huntington	N/A	N/A	N/A
St James	N/A	N/A	N/A
Smithtown	N/A	N/A	N/A
SCWA	N/A	N/A	N/A
*The numbers reported by WAWNC were 2,721,870,000 and 397,981,500. WFLI reduced these numbers by a factor of 1,000 in this table on the assumption that WAWNC reported gallons instead of the thousands of gallons that the reporting form instructions requested.			

Table 7. Typical Potential for Saving Water by Use of Household Appliances Designed to Reduce Water Consumption*		
Household Appliance		
Toilets	Installation Date	Average Water Consumed per Flush (gal)
	Pre 1950	7
	1950-1980	5
	1980-1995	4
	1995 to present	1.6
Showerheads	Type	Gal/min
	Old	3-6
	Low volume	less than 2.5
Faucets	Type	Gal/min
	Conventional high volume	5
	Low-flow	2.5
Washing Machines		New models use approx. ½ as much water as old models
Dishwashers	Type	Typical Water Consumption
	New	Can use as little as 4.5 to 7 gal/load
	Pre-1995	12 -14 gal/load
Smart Irrigation Controllers		Installation of smart controllers can reduce home irrigation demand by as much as 25%
* From reports prepared by D&B Engineers and Architects, P.C.		

Table 8. Lawn Watering Requirements*	
Minimum Turf (Fine Fescue Turf Grass)	Irrigation is not necessary except when starting newly seeded lawns.
Regular Maintenance Lawns (Fescues, Kentucky Bluegrass and Perennial Rye Grass)	Water lawns only when necessary during the growing season. Usually, this type of lawn can go to the point where it will start to show a need for water. When watering, apply sufficiently to penetrate soil five or six inches deep. The need to irrigate should be no more frequently than once a week.
Top-Quality Lawns (3 or 4 Improved Kentucky Bluegrass Varieties)	Apply about one inch of water every four to five days, except during periods of adequate rainfall. Avoid frequent, short-interval watering.
* From Lawn Maintenance Guidelines by Cornell Cooperative Extension	

APPENDIX A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water, Region 1
SUNY @ Stony Brook, 50 Circle Road, Stony Brook, NY 11790
P: (631) 444-0405 I F: (631) 444-0424
www.dec.ny.gov

January 5, 2016

Dear Water District Superintendent/official:

This office recently conducted an analysis of past annual pumpage data for Nassau and Suffolk County. The results show peak seasonal water demand on Long Island is at least twice the rate of the colder months. Results for 2015 show that both Nassau and Suffolk County have exceeded the safe yield as cited in the 1986 Long Island Groundwater Management Program. With other concerns such as salt water intrusion, contaminant plumes migration, salt water upconing and competing demands, a concerted effort is needed to reduce peak season water demand.

New York State Codes, Rules and Regulations Title 6 Chapter V Part 601.10 requires a Water Conservation Plan ("Plan") be submitted to the Department by water suppliers. With the above concerns in mind, this office has completed an update to our Water Conservation Annual Reporting Form ("Reporting Form"). We want to take this opportunity to inform you of the particular requirements included in the Reporting Form.

Aside from having to report on various water reduction measures, the center piece of the Reporting Form is the goal of reducing peak season water demand by 15% over the next 3 to 4 years. Percent reduction calculation should be based on 2012 pumpage as it is considered a normal precipitation year. By April 28, 2017, each water district is required to prepare and submit to the Department the Reporting Form that addresses all items listed therein. Aside from reporting on the 15% reduction goal, the Reporting Form documents the district's conservation achievements over the past year; demonstrates that the objectives for the previous year were met; states the planned measureable objectives and information on funding sources for the next year; and states the long term goals and funding sources for conservation efforts over the next five years.

For the water districts that do not have a Water Conservation Plan or have not previously submitted a copy, please submit a Plan by April 28, 2017, that at a minimum takes into account all the items listed in the Reporting Form.

Please submit the completed Reporting Form or your initial Water Conservation Plan via e-mail to R1dow@dec.ny.gov by **April 28, 2017**.

We look forward to cooperatively solving the peak seasonal water demand concern. If you wish to discuss the content of the Reporting Form/Water Conservation Plan, we are available to do so. Please contact Sara Reutlinger of this office at (631) 444-0354 or via e-mail at sara.reutlinger@dec.ny.gov to make arrangements.

Sincerely,

Tony Leung, P.E., M.B.A.
Regional Water Engineer

cc: File

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation