# Water Supply Sustainability for Hempstead Harbor Communities
# Nassau County, NY

October 2022

By Sarah Meyland, MS, JD, for the
Coalition to Save Hempstead Harbor


Report printed on recycled paper.

Cover photos: top right by David North (2019) and all others by Allen Moore (2021).

Report release date: October 21, 2022

# TABLE OF CONTENTS

# LIST OF TABLES

## LIST OF FIGURES

# PREFACE

This report was commissioned by the Coalition to Save Hempstead Harbor (CSHH). The Coalition is a not-for-profit organization, founded in 1986. Its office is in Sea Cliff, New York.

CSHH is dedicated to identifying and eliminating environmental threats in and around Hempstead Harbor. Its objective is to advance the public interest in restoring the harbor to its full ecological potential and to promote sustainable practices that will ensure the protection and resiliency of Hempstead Harbor and surrounding communities.

The fundamental force behind CSHH's efforts is the belief that concerned and informed citizens can make a difference in events that shape the future. The Coalition seeks to increase awareness of environmental issues and promote a greater appreciation of the local environment. Most important, the public is encouraged to participate in local conservation issues.

The goal of this report is to call attention to the impacts of significant new development on the water resources of the Hempstead Harbor area. The long-term consequences of this growth are addressed in this report.

For more information on the Coalition to Save Hempstead Harbor, please visit https://coalitiontosavehempsteadharbor.org/.

## EXECUTIVE SUMMARY

This report, *Water Supply Sustainability for Hempstead Harbor Communities, Nassau County, Nassau County, NY*, was commissioned by the Coalition to Save Hempstead Harbor. It is designed to review the potential impact that the many new development projects being proposed or approved in the area surrounding Hempstead Harbor might have on the local water suppliers, the sustainability of the water resource, and on Hempstead Harbor itself.

Hempstead Harbor is an inlet along the north shore of Nassau County that opens into Long Island Sound. It is bordered on the west by the Cow Neck peninsula (Port Washington) and on the east by the Town of Oyster Bay and the City of Glen Cove.

Seven different water suppliers are surveyed. Their service areas surround Hempstead Harbor, and they will be responsible for providing water to the new development projects as they are completed.

Fifteen proposed and/or approved development projects are identified in the Hempstead Harbor region. The ability of the seven water suppliers to meet current and future water demand is evaluated. Information on each water supplier is provided by the annual water conservation reports prepared by each water supplier, as required by the New York State Department of Environmental Conservation (DEC).

In 2016, the DEC directed all water suppliers on Long Island to try to achieve a 15% reduction in water use during the yearly peak water demand period, May through September. The effort is on-going. To determine the degree of success toward this goal, data for the years 2018, 2019, and 2020 were reviewed. Of the seven water suppliers reviewed, three achieved modest water withdrawal reductions, and four recorded some increases in water demand over the three-year period.

This report also examines the water demand that will be created for some of the larger development projects and discusses the impact this new water need will have on the water suppliers affected. The net effect is that new development will make it practically impossible for involved water suppliers to reduce future water withdrawals without a regional effort to make water conservation a more integral factor when reviewing and approving new growth and development.

The goal of this report is to call attention to an issue that is often overlooked due to the way that water demand and sustainability is handled during environmental and planning reviews. Recommendations for change are presented to address this important omission.

## I. INTRODUCTION

In 1986, the New York State Department of Environmental Conservation (DEC) first imposed groundwater withdrawal limitations on water suppliers in Nassau County.[1] Since then, there has been a growing concern that water demand along much of the northern half of the county may be reaching a tipping point – meaning that the need for water might exceed the ability of the aquifer system to sustainably meet those needs. The 1986 program never achieved any notable results.

In January 2016, the NYS DEC revisited concerns over water supply sufficiency. The DEC notified all water suppliers on Long Island that they should develop and implement their own water conservation plans to reduce by 15% the water used during the peak water demand season, May – September. The notification letter stated that the DEC had assessed past annual pumpage information and found that peak seasonal pumpage was at least "… twice the rate of [pumpage in] the colder months."[2]

In his letter, Mr. Leung, the Regional Water Engineer, also noted:

> "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 saltwater intrusion, contamination plumes migration, salt water upconing and competing demands, a concerted effort is needed to reduce peak water demand."[3]

Also in 2016, a major new groundwater study was initiated, led by the US Geological Survey (USGS) in partnership with the NYS DEC. The *Long Island Groundwater Sustainability Study* marked the first regional, scientific study of the aquifer system in over thirty years. The study was designed to evaluate the present and future sufficiency of the groundwater supply, update and refine our knowledge of the aquifers, investigate the current status of saltwater intrusion, and develop a regional groundwater computer model to predict future groundwater responses to changing conditions including an increase in water demand. Phase 1 of the study focused on western Long Island (Nassau and Queens Counties), and it is scheduled to be released by the end of 2022. The full study (including Phases 2 and 3) is expected to conclude in 2026.

## II. WATER SUPPLY ALONG NASSAU COUNTY'S NORTH SHORE

For over the past twenty years, water problems have continued to be in the news and on peoples' minds. One aspect of the water concern is the impact that numerous new development projects, primarily new high-density housing, may have on the limited groundwater supply along the north shore. The communities around Hempstead Harbor have been faced with the challenges of new development that may generate tax revenue benefits for municipalities while they will also bring additional water demand. One crucial element for consideration is the question of what the impact is on the ability of local water suppliers to meet their water conservation goals while also being obligated to provide water to a growing list of current and future development projects.

In light of this concern, the Coalition to Save Hempstead Harbor commissioned this report to evaluate whether and how water utilities around Hempstead Harbor can bring down their water demand by 15%. The 2016 letter from the NYS DEC to water suppliers suggested that they reduce water demand over the "next 3 to 4 years." It has been six years since the DEC letter was issued. This report reviews the level of success all public water suppliers surrounding Hempstead Harbor are having in meeting the 15% summer water demand conservation goal. The report assesses what role new growth and development will play in the ability of water suppliers to meet this goal.

This report also specifically examines water use information for seven public water suppliers around Hempstead Harbor (listed geographically, north to south starting on the eastern shore):

- Locust Valley Water District (included because it sells water to the City of Glen Cove)
- City of Glen Cove Water Department
- Sea Cliff Water Company (part of New York American Water/Liberty Water and soon to be part of the North Shore Water Authority)
- Glenwood Water District (includes Glenwood Landing)
- Roslyn Water District
- Port Washington Water District
- Sands Point Village Water Department

(For the purposes of this report, both water districts and water departments are referred to by the abbreviation "WD.")

As part of the 2016 water conservation initiative by the DEC, a revised annual water reporting form was provided to water suppliers to report more detailed information on water use. These reports are available on the DEC website, DECinfoLocator (https://on.ny.gov/DECinfoLocator), and they are the main source for the detailed information regarding groundwater withdrawals and water use reduction measures reviewed for this report.

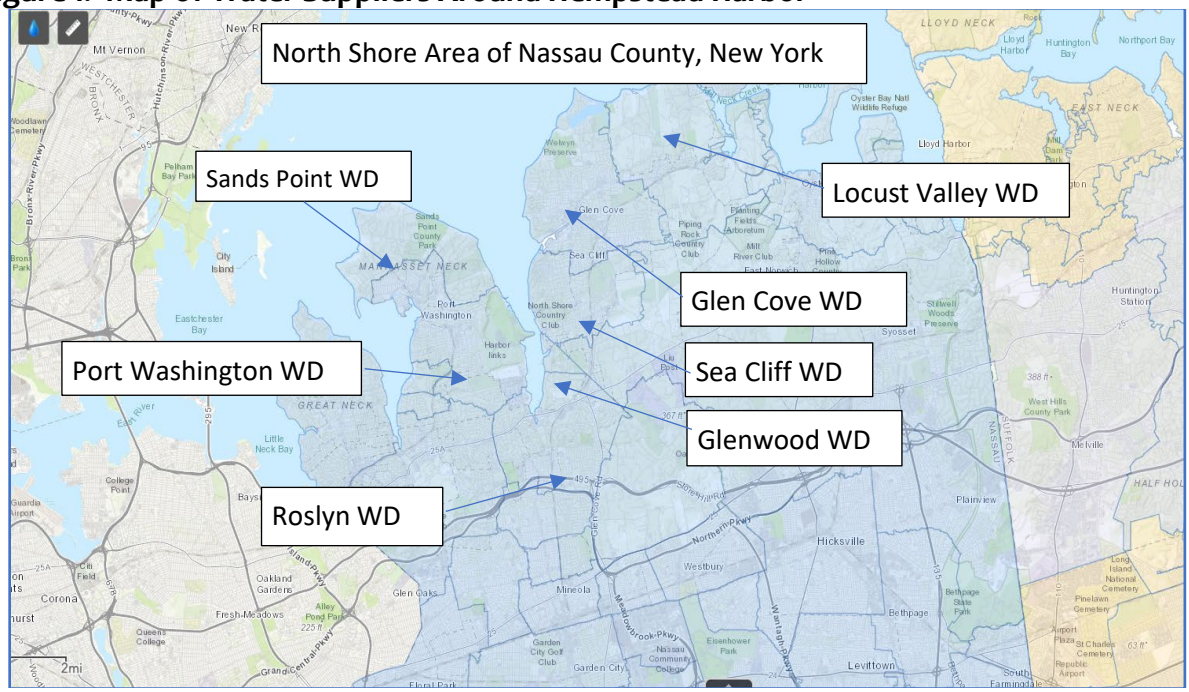
A key element of the new water conservation program was the selection of a benchmark year to evaluate the progress of each water supplier toward the 15% conservation goal. The benchmark year selected by the DEC was 2012, because "… it is considered a normal precipitation year."[4]

## III. WHERE DOES YOUR WATER COME FROM?

Most people on Long Island know the name of their water supplier but may not know the actual boundaries of their service areas. In Nassau County, there are nearly forty-five different public water suppliers, and the service areas do not necessarily coincide with other jurisdictional boundaries.

In preparing to discuss the correlation between development projects and the water supply areas they fall within, the following provides a short overview of the water suppliers we are reviewing and their service areas, including service area maps where they were available. In total, the seven public water suppliers described below serve a combined population of **102,550 people**.

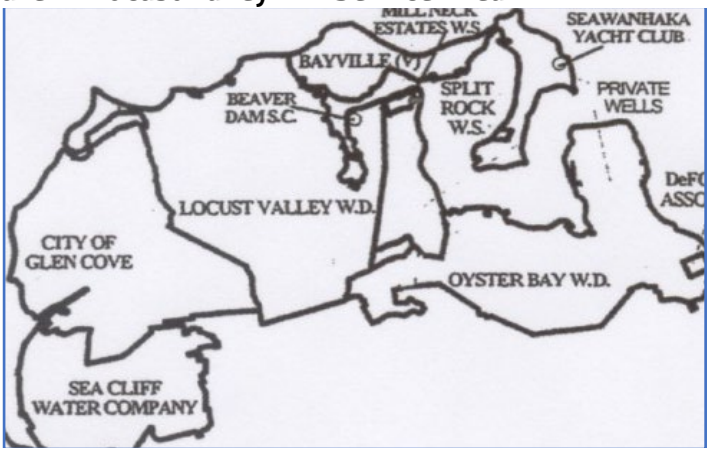
**Figure 1: Map of Water Suppliers Around Hempstead Harbor**




*Source: DECinfoLocator https://on.ny.gov/DECinfoLocator*

1. **Locust Valley WD:** By land area, Locust Valley is one of the larger water suppliers on Nassau County's north shore, although the population it serves is relatively small. Locust Valley provides water to the villages of Lattingtown and Locust Valley along with sections of Mill Neck and Matinecock. Locust Valley is not technically within the area of Hempstead Harbor; however, it is included in this review because it also sells water to the City of Glen Cove. Within its service area, Locust Valley WD serves a population of 7,500.

**Figure 2: Locust Valley WD Service Area**

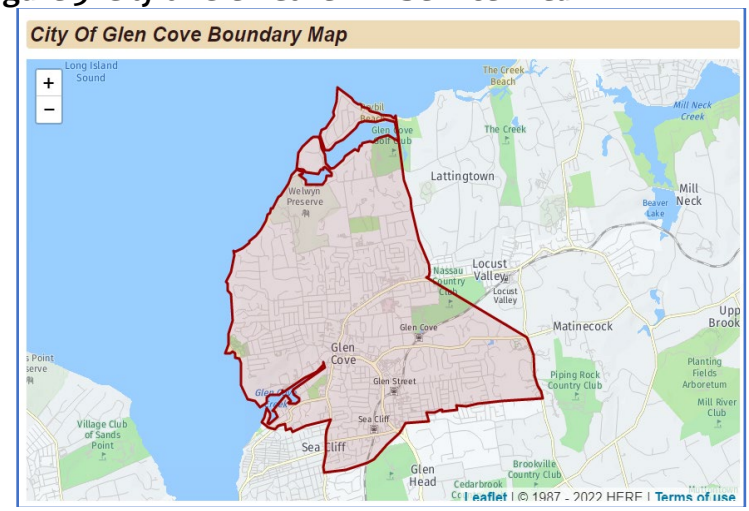



*Source: Nassau County Department of Health, 1998, Ground Water and Public Water Supply Facts for Nassau County, NY*

**2. City of Glen Cove WD:** The city operates its own water department that withdraws water from its own wells within the city limits. All five of its water supply wells have experienced water quality problems. At least one well has temporarily closed. The city also purchases water

from the Locust Valley WD, and some residents may receive water from Sea Cliff WD (transitioning from Liberty Utilities to a new North Shore Water Authority). The City of Glen Cove water department serves a population of 28,000.

**Figure 3: City of Glen Cove WD Service Area**




*Source: https://newyork.hometownlocator.com/cities/map,n,glen%20cove-ny,fid,977339.cfm*

**3. Sea Cliff WD**: This water supplier is now owned by Liberty Utilities (which recently purchased New York American Water), a private water company that will be converted into the North Shore Water Authority pursuant to state legislation of 2021. The water district supplies the communities of Sea Cliff and Glen Head. It also serves portions of Glenwood Landing and parts of Old Brookville, Roslyn Harbor, and Glen Cove. Sea Cliff WD serves a population of 13,450.

**Figure 4: Sea Cliff WD Service Area**


*Source: https://www.seacliff-ny.gov/department-public-works/pages/water-supply*

**4. Glenwood WD**: This is a small water supplier operating along the eastern shore of Hempstead Harbor. It serves portions of Glenwood Landing. It purchases most of its water from the Roslyn Water District. It includes the Glenwood Landing Power Station. Glenwood WD serves a population of 1,000.

**Figure 5: Glenwood WD Service Area**


*Source: https://www.northwordnews.com/glenwood-water-restrictions.html*

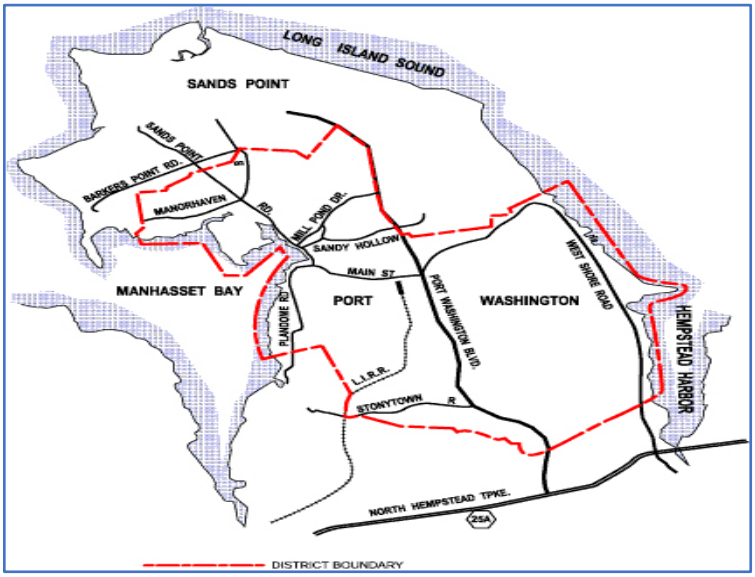
**5. Roslyn WD:** Roslyn is another large district by population served and distributes to a variety of nearby communities. The Roslyn Water District serves the following areas: the villages of Roslyn, Roslyn Estates, East Hills, parts of Roslyn Heights, Roslyn Harbor, Flower Hill, North Hills, Greenvale, Albertson, Glenwood Landing, and Port Washington. The reported population served by the district is 17,900 plus a combined population of 1,800 people in Albertson and Glenwood Landing.

**Figure 6: Roslyn WD Service Area**


*Source: Roslyn Water District Bond Act Report, 2020*

**6. Port Washington WD**: Serving a population of 30,000, Port Washington is the largest water district reviewed. It serves the communities of Port Washington and a portion of Flower Hill, Plandome, Manorhaven, and Baxter Estates. During the summer, the district may provide water to the Sands Point Water District.

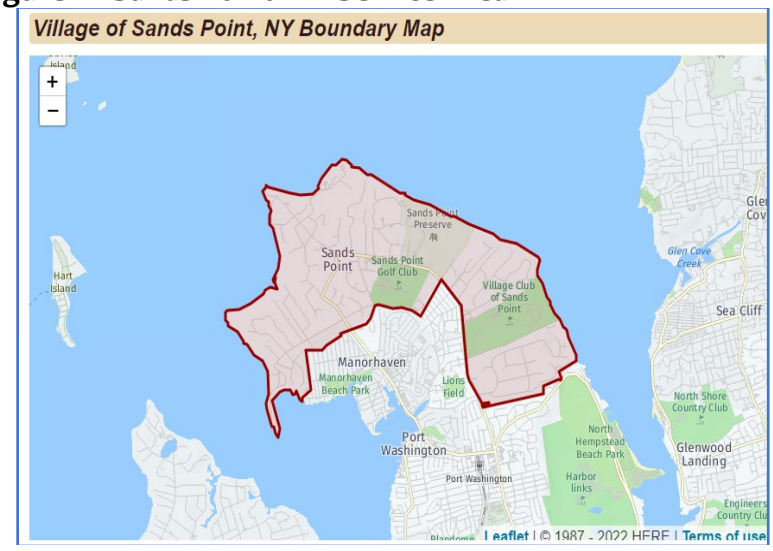
**Figure 7: Port Washington WD Service Area**




*Source: https://pwwd.org/about/about-our-district/*

**7. Sands Point WD**: The Village of Sands Point has its own water department, the Sands Point Water District. It does not distribute water beyond the village boundaries. Sands Point WD serves a population of 2,900.

**Figure 8: Sands Point WD Service Area**




*Source: https://newyork.hometownlocator.com/cities/map,n,sands%20point-ny,fid,964415.cfm*

## IV. WATER USE INFORMATION ABOUT THE SEVEN PUBLIC WATER SUPPLIERS SURROUNDING HEMPSTEAD HARBOR

The following analysis examines how water has been used in the seven water supply systems of interest. It looks at total annual water withdrawals for each of the three years where annual reports were available: 2018, 2019, and 2020. This analysis shows the total water pumpage (e.g., groundwater withdrawal) for each supplier and how pumpage compares over the three years. The report then focuses on water use during the peak water demand season, May through September. And the report compares the average peak demand for three years with the peak demand for the benchmark year, 2012.

In general, this report uses **total water pumped,** as reported by each supplier, as the amount used for analysis. The amount of total water pumped is slightly higher than the amount of total water consumed, which is the amount of water for which customers are billed. Total water pumped includes water that leaked from the system or was used to flush the water mains and similar uses.

In Table 1, the amount of water pumped for each water supplier is listed, as well as how much water was used on a per-person basis. Several observations should be pointed out. A few water suppliers, such as the City of Glen Cove and Port Washington, serve a similar population size, around 30,000 people, and they pump a similar amount of water each year. However, the factors behind their water use are different.

A closer look at the information in Table 1 shows some of the important differences between the seven water suppliers. It shows, for example, the amount of water use on a per-person basis for each water supplier, along with how water use varied from year to year. The population served by each water supplier is also presented, which also helps to explain why the amount of water use changes from one supplier to another.

### A. Comparison of Total Water Demand and Per Capita Water Use

Obviously, not all water suppliers and communities are the same. This is reflected by both the total amount of water withdrawn each year as well as the amount of water used on a per-person basis, a statistic known as *per capita* water use.

The City of Glen Cove does not serve the largest population size (28,000) among the suppliers being studied, but it has the highest total water use. As indicated in Table 1, its total usage includes water purchased from the Locust Valley WD.

The Port Washington WD serves a larger population (30,000) but has a lower water demand over the three reporting years when compared with Glen Cove. Port Washington did not report any sale of water to other suppliers (2018 – 2020) or water imported from any other water supplier.

**Table 1: Summary of Water Use by Public Water Supply District (2018 – 2020)**
(BG = billion gallons; MG = million gallons; MGD = million gallons per day; GPD = gallons per day)

| Water Supplier | 2018 Water Pumped | 2019 Water Pumped | 2020 Water Pumped | Per capita Water use | Population Served (people) |
|---|---|---|---|---|---|
| **Locust Valley WD** | 640.549 MG | 629.458 MG | 706.806 MG | 234 GPD (2018)<br>209 GPD (2019)<br>220 GPD (2020) | 7,500 |
| Water sold to Glen Cove | 27.523 MG | 22.414 MG | 49.566 MG | | |
| **City of Glen Cove Water Dept** | 1.278 BG | 1.314 BG | 1.342 BG | 108 GPD (2018)<br>109 GPD (2019)<br>110 GPD (2020) | 28,000 |
| Water purchased from Locust Valley WD | 27.523 MG | 22.414 MG | 49.566 MG | | |
| **Sea Cliff WD** | 440.391 MG | 441.769 MG | 482.059 MG | 90 GPD (2018)<br>93 GPD (2019)<br>98 GPD (2020) | 13,450 |
| **Glenwood WD** | 42.217 MG | 41.744 MG | 41.159 MG | 108 GPD (2018)<br>109 GPD (2019)<br>NA (2020) | 1,000 |
| Water purchased from Roslyn WD | 42 MG | 41 MG | 41 MG | | |
| **Roslyn WD** | 1.262 BG | 1.215 BG | 1.265 BG | 170 GPD (2018)<br>170 GPD (2019)<br>170 GPD (2020) | 17,900 |
| Water sold to **Albertson WD** and **Glenwood WD** | 8 MG<br>42 MG | 8 MG<br>41 MG | 8 MG<br>41 MG | | 1,800 |
| **Port Washington WD** | 1.254 BG | 1.265 BG | 1.320 BG | 111 GPD (2018)<br>116 GPD (2019)<br>118 GPD (2020) | 30,000 |
| **Sands Point WD** | 359.492 MG | 379.197 MG | 394.659 MG | 339 GPD (2018)<br>320 GPD (2019)<br>330 GPD (2020) | 2,900 |

*Source: Annual Water Conservation Reports from each water supplier for 2018, 2019, and 2020. Data obtained from DECinfoLocator.*
*NOTE: All values in Table 1 are pumpage amounts reported by each water supplier to DEC in the annual Water Conservation Report. For Glenwood WD, the 2020 pumpage value is from the 2020 Pumpage Report. The annual Water Conservation Report for 2020 for Glenwood WD is not available.*

Both Glen Cove and Port Washington have some of the lowest per capita water use amounts of the water utilities being evaluated. Glen Cove reports per person water use in the 108 – 110 gallons-per-day range. This is similar to the national average for per person use of approximately 100 GPD.

Port Washington has slightly more people and a slightly higher per capita water use, 111 – 118 GPD. It should be noted that the City of Glen Cove has experienced the most new development of any of the suppliers studied. The full impact of the new growth has not yet been fully experienced by the city.

**Table 2: Low per Capita Water Use for the City of Glen Cove and Port Washington WD**

| Water Supplier | Total Pumpage 2018 | Total Pumpage 2019 | Total Pumpage 2020 | Per Capita Water Use |
|---|---|---|---|---|
| City of Glen Cove (Population 28,000) | 1.305 BG | 1.336 BG | 1.391 BG | 108 – 110 GPD |
| Port Washington WD (Population 30,000) | 1.254 BG | 1.265 BG | 1.320 BG | 111 – 118 GPD |

*Source: Annual Water Conservation Reports, City of Glen Cove, Annual Water Conservation Reports, Port Washington WD*
*Note: Glen Cove's total demand includes water from the Locust Valley WD. See Table 1 for the breakdown of water from Glen Cove and Locust Valley.*

The Roslyn WD is another supplier that has also experienced increased development activity. Roslyn serves a much smaller population (17,900); however, it also sells water to Albertson WD and Glenwood WD. Roslyn experiences a very high per capita water use level, reportedly 170 GPD. Many of its top ten consumers are large, residential rental and condo housing complexes. This may skew the results if the housing units are not individually counted. It may be that Glen Cove will see this effect when all its development is completed.

At the other end of the per capita water use spectrum are the Sands Point WD and the Locust Valley WD. These two water suppliers serve mainly single-family residential customers with large properties. They have reported the highest per capita water use levels. The Sands Point WD serves a population of 2,900 people. Locust Valley WD serves a population of 7,900 people.

**Table 3: High Per Capita Water Use in Sands Point and Locust Valley WDs**

| Water Supplier | Total Pumpage 2018 | Total Pumpage 2019 | Total Pumpage 2020 | Per Capita Water Use |
|---|---|---|---|---|
| Sands Point WD (Population 2,900) | 359.492 MG | 379.197 MG | 394.659 MG | 320 – 339 GPD |
| Locust WD (Population 7,900) | 640.549 MG | 629.458 MG | 706.806 MG | 209 – 234 GPD |

*Source: Annual Water Conservation Reports, Sands Point and Locust Valley WDs (2018 – 2020)*

Both Sands Point and Locust Valley are different from the other water suppliers because their customer base is nearly all residential (no commercial) and the residents mainly consist of

large-lot properties. The irrigation of these large properties, 1 to 10 acres, drives up the per person water use, as the statistics in Table 3 show.

From all the data on water use by the seven water districts, one fact stands out. Consistently, the month with the highest water use is July. All water suppliers showed the same pattern of water use. The high summer water demand is clearly driven by outdoor water use, particularly summertime irrigation of lawns and property. It is this water use pattern that the DEC is trying to bring down through its 15% water conservation program.

**B. Comparison of 2018-2020 Peak Summer Demand with That of 2012 Benchmark Year**

As directed by the NYS DEC, individual water suppliers are asked to compare their water use during the peak water demand season with peak season water use for the 2012 reporting year. Table 4 presents the pumpage amounts for each supplier for May – September 2012.

**Table 4: 2012 Peak Water Demand Season (May – September)**

| Water Supplier | Total Annual Pumpage in 2012 | Peak Water Pumpage May – September 2012 | Peak Pumpage as a Percentage of Total Annual Pumpage |
|---|---|---|---|
| Locust Valley WD | 650,383 MG | 441,972 MG | 67.9% |
| City of Glen Cove WD | 1,394,516 MG | 756,811 MG | 54.2% |
| Sea Cliff WD | 461,761 MG | 264,686 MG | 56.7% |
| Glenwood WD | 55,178 MG | 36,746 MG | 66.5% |
| Roslyn WD | 1,196,644 MG | 737,833 MG | 61.6% |
| Port Washington WD | 1,324,795 MG | 743,878 MG | 56.1% |
| Sands Point WD | 384,690 MG | 271,160 MG | 70.0% |

*Source: NYS DEC Freedom of Information Act (FOIA) Request 4-6-2022*

It should be remembered that there are seven months in the off-peak season and five months in the peak season. The five months of the summer season have an over-sized impact on total water use for the year. This is shown in the last column of Table 4. Not all water suppliers are affected equally by the imbalance in summer vs. winter water demand. The highest summer impact is observed in the Sands Point WD at 70% of total water use. Locust Valley (67.9%) and Glenwood (66.5%) are close behind. As noted, both Sands Point and Locust Valley are populated with residential properties on large lots that include large areas being irrigated by homeowners.

Knowing the 2012 peak season pumpage figure makes it possible to determine how close individual water suppliers have come to reaching the 15% water conservation goal. A summary of the peak-season pumpage analysis is provided in Table 5. (The details of pumpage for 2012 compared with 2018 – 2020 pumpage is provided in Appendix, Table A-1.)

The only water supplier to achieve a 15% or more reduction was the **Glenwood WD,** which achieved a **19.3**% reduction. Glenwood serves part of the Glenwood Landing area and the LIPA/National Grid power station. National Grid began decommissioning a substation at the plant after the 2012 water reporting year. Although some of the water needed by the power substation for cooling came from Hempstead Harbor, a portion of freshwater was also supplied from an on-site well and water supplied by Glenwood Water District. Approximately 1.8 million gallons (10% of 2011 water use) was no longer provided by Glenwood WD when the substation was decommissioned. This reduction may explain part of the significant drop in water use after 2012. Glenwood WD purchases most of the water it distributes from the Roslyn WD.

**Table 5: Summary of Increase or Decrease in Summer Pumpage Averaged Over the Study Period (2018 – 2020) Compared with the 2012 Peak Season**

| WATER SUPPLIER | 2012 PEAK PUMPAGE | AVERAGE PEAK SUMMER PUMPAGE 2018 – 2020 | PERCENTAGE DECREASE IN PUMPAGE | PERCENTAGE INCREASE IN PUMPAGE |
|---|---|---|---|---|
| Locust Valley WD | 441.972 MG | 485.081 MG | | 9.75% **increase** |
| City of Glen Cove WD | 756.811 MG | 714.312 MG | 5.6% **reduction** | |
| Sea Cliff WD | 264.686 MG | 272.179 MG | | 3.57% **increase** |
| Glenwood WD | 36.746 MG | 29.659 MG* | 19.28% **reduction** | |
| Roslyn WD | 737.833 MG | 779.170 MG | | 5.6% **increase** |
| Port Washington WD | 743.878 MG | 735.704 MG | 1.1% **reduction** | |
| Sands Point WD | 271.160 MG | 272.856 MG | | 0.62% **increase** |

*Source: The annual Pumpage Report for 2018, 2019, and 2020.*
**Note: For Glenwood WD, the average is for 2018 and 2020 because the 2019 Pumpage Report is unavailable.*

The three water suppliers that **reduced** water withdrawals are the **Glenwood WD,** by **19.3%;** the **City of Glen Cove,** by **5.6**%; and **Port Washington WD,** by **1.1**%.

As for increases in water withdrawals, four water suppliers reported **increased** water use compared with 2012 use. **Sands Point WD** reported a **0.6** % increase; **Sea Cliff WD,** a **3.5**% increase; **Roslyn WD,** a **5.6**% increase; and **Locust Valley**, a **9.8**% increase. Locust Valley, with the highest increase, 9.8%, supplies water to Glen Cove, helping to account for the 5.6% reduction reported by Glen Cove.

### C. Conclusion from Water Withdrawal Data

According to the reports from the water suppliers, those suppliers located around Hempstead Harbor have had limited success in bringing down annual water use, especially during the peak summer season. This is not necessarily for lack of trying to conserve. Port Washington, Roslyn, and other suppliers have implemented progressive policies and programs to help their customers to be more aware of their irrigation practices. They have started programs to

encourage the use of smart irrigation controllers, promote water conservation days, and bring conservation messages to local fairs and celebrations. Port Washington and Roslyn have assigned all customers to irrigation zones to regulate time and days of watering. To be successful, it is going to take a much broader level of public engagement and new policies and programs to achieve the level of savings that are now the stated goal of the DEC initiative.

A key challenge that public water suppliers must now face is reducing water demand when local planning decisions approve new developments that create more population growth, and eventually increased water demand. In some instances, water suppliers already are struggling to meet the water demand of the residents they currently serve.

## V. DEVELOPMENT PROJECTS PROPOSED AND/OR APPROVED AROUND HEMPSTEAD HARBOR

Table 5 shows that six out of the seven public water suppliers that supply water to communities around Hempstead Harbor have been unable to achieve the 15% water use reduction goal. This section of the report reviews the large number of new or proposed building projects, mainly multifamily housing proposals, which will increase the demand for water.

There are as many as 15 development projects either approved or in the planning stage within the communities around Hempstead Harbor on Nassau County's north shore. Tables 6 – 10 organize these projects by the water supplier that will service each project.

**Table 6: City of Glen Cove – Projects Proposed, Being Constructed, or Recently Completed**

| Site Name | Number of Units | People per Unit | Status | Comments |
|---|---|---|---|---|
| RXR Garvies Point Phase I | 552 (1-3 bedrooms) | 1 – 3+ | Approved | Completed and residents moving in |
| RXR Garvies Point Phase II* | 573 (1-3 bedrooms) | 1 – 3+ | Pending | Amended planned unit development (PUD) in 2020 |
| RXR Konica/Minolta* Property | 336 | | Pending | Part of Garvies Point Phase II PUD Amendment |
| RXR 1 Garvies Point Road* | 105 | | Pending | Part of Garvies Point Phase II PUD Amendment |
| Crown Dykman site | Unknown | | No proposal | Adjacent to RXR Garvies Point Phase I & II |
| North Realty – 40 Garvies Point Road | 400 | | Pending | Independent project adjacent to Garvies Point Phase I & II |
| Village Square | 146 (1-3 bedrooms | 1 – 3+ | Approved | Completed, almost fully occupied |
| Livingston/ The Villa | 176 | | Approved | Not yet started |

| | | | | |
|---|---|---|---|---|
| 115 Glen Street | 30 | | Pending | Originally 16 units proposed |
| Orchard Neighborhood | 50 | | No Proposal | |
| Commercial space, shops, and restaurants | Unknown | | | Some projects include commercial space options |
| **Total approved/proposed units** | 2,368 | | | |

*****See VHB, December 24, 2020, PUD Amendments letter submitted to City of Glen Cove Planning Board; updated with "Conceptual Build-Out of the 1 Garvies Point Road Property or Konica Minolta Property Application for PUD Amendment Garvies Point Mixed-Use Waterfront Development Project, City of Glen Cove," see https://glencoveny.gov/wp-content/uploads/2021/04/PUD-Amendment-Supplemental-Analysis-March-2021.pdf.

By far, the community experiencing the most development is the City of Glen Cove. Much of this development is connected with the properties in the Garvies Point area being developed by RXR Realty. Only a small part of the total potential construction for this area has been completed and occupied as of 2022. Thus, the full impact on the water needs of the city has not been reported or experienced.

**Table 7: Sea Cliff WD – Potential Projects**

| Site Name | Number of Units | People per Unit | Status | Comments |
|---|---|---|---|---|
| North Shore Country Club (also partly in Glenwood WD) | Unknown | Unknown | Unknown | Potential site for future development |
| Former Sea Cliff Water Co. office, 325 Prospect Avenue | Unknown | Unknown | Purchased by the Village of Sea Cliff | Property features being assessed; no residential development planned |

**Table 8: Glenwood WD – Potential or Recently Completed Projects**

| Site Name | Number of Units | People per Unit | Status | Comments |
|---|---|---|---|---|
| Glen Harbor | 48 (1-3 bedrooms) | 1 – 3+ | Approved | Completed and ready for occupancy |
| Old Shore Realty site | Unknown | Unknown | Delisted Superfund site | Potential site for future development |

**Table 9: Roslyn WD – Projects Proposed, Being Constructed, or Recently Completed**

| Site Name | Number of Units | People per Unit | Status | Comments |
|---|---|---|---|---|
| Roslyn Landing | 78 (all town homes) | 2-3 | Approved | Completed and most units occupied |
| 45 Lumber Road LLC | 33 (all 2- bedroom units) | 1 – 3+ | Approved | |
| RXR Engineers Club | 92 | Unknown | Pending | Will cluster units on 18 acres of the 139-acre golf club |
| Warner Avenue LLC | 54 | Unknown | Approved | Transit-oriented project planned for 0.85-acre lot, near Roslyn train station |

**Table 10: Port Washington WD – Projects Proposed**

| Site Name | Number of Units | People per Unit | Status | Comments |
|---|---|---|---|---|
| Southern Land Co. | 176 (1-3 bedrooms) | 1 – 3+ | Pending - DEIS submitted 8-22-2022 | Final EIS expected by end of 2022 |

There are no projects proposed within the Sands Point WD at this time.

Based on what is known about the projects to date, as presented in Tables 6 – 10, there are at least 2,849 new units of housing being proposed or constructed around Hempstead Harbor. The number of new residents moving into the area around Hempstead Harbor could reach 6,000 people or more, depending on how the units are designed and filled. Most projects are planning to have units with one-, two- and/or three-bedroom options.

(Development projects within the Locust Valley WD were not reviewed for this report.)

## VI. AN ANALYSIS OF POTENTIAL WATER DEMAND FROM DEVELOPMENT PROJECTS PROPOSED AND/OR APPROVED AROUND HEMPSTEAD HARBOR AND THEIR IMPACT ON WATER AVAILABILITY

### The City of Glen Cove

The community that has experienced the largest growth in new development is the City of Glen Cove. A close look at the proposals responsible for much of this growth can be used as a template for considering the overall growth in the region. By far, the largest single project is the Garvies Point development.

The many projects contained in the Garvies Point area, Phases 1 and 2, have been updated and revised in the Planned Unit Development (PUD) Amendment of 2020. In the PUD Amendment, the developer reported the anticipated water demand for the various project components. The PUD projected that a one-bedroom unit (assuming one person) would use 165 gallons of water per day. A two-bedroom unit is projected to need 330 gallons of water per day, and the three-bedroom unit is projected to use 440 gallons per day. The cumulative projected use for the project is 380,986 gallons of water per day. Calculated over a one-year period, the water demand for this project would be over **139 million gallons per year,** according to the developer. This represents new water demand on top of current water needs reported by the city.[5]

Table 11 (below) shows that the City of Glen Cove pumped **1.32 billion gallons** of water in 2020 (see column, 2020 Annual Pumpage, City of Glen Cove). The calculated amount of water needed for the Garvies Point project is **139 million gallons** per year as reported in the 2020 Garvies Point PUD Amendment. The 2020 PUD Amendment projected Garvies Point demand would be equal to **10.5**% of the 2020 water use in Glen Cove. Stated another way, Garvies Point would raise water demand by approximately **10.5%.**

However, the projected water demand numbers for Garvies Point East Parcel Phase 2 were updated to include both the 1 Garvies Point and Konica properties under the 2021 Garvies Point PUD Amendment. Therefore, the Garvies Point total water demand numbers are recalculated under the updated scenario. With the recalculated totals, the projected Garvies Point water demand increases to **13.3**% of Glen Cove's total pumpage. By comparison, all water used by the top 10 Glen Cove water consumers in 2020 (which did not include Garvies Point) was **9.3**% of total water use.

**Table 11: Summary of Impact from Garvies Point on the City of Glen Cove Water Supply**

| Phase/Location | Projected Daily Average Demand | Projected Annual Demand | 2020 Annual Pumpage for Glen Cove | Projected Garvies Point Water Demand as a % of Glen Cove's 2020 Pumpage |
|---|---|---|---|---|
| Garvies Point – West Phase 1 | 176,693 GPD | 64.492 MG | | |
| Garvies Point – East Phase 1 | 107,960 GPD | 39.405 MG | | |
| Garvies Point – East Parcel – Phase 2 | 96,333 GPD | 35.161 MG | | |
| **TOTALS** | **380,986 GPD** | **139.058 MG** | **1.32 BG** | **Garvies Point equal to 10.5% of total 2020 water demand** |
| | | | | |

| | | | | |
|---|---|---|---|---|
| **Updated** Garvies Point East Parcel – Phase 2 + Future Phase (including both 1 Garvies Point Road and Konica) | 195,408 GPD | 71.324 MG | | |
| **Recalculated Totals** (Garvies Point West, Phase 1 + Garvies Point East Phase 1 + Updated Garvies Point East Phase 2) | **480,061 GPD** | **175.221 MG** | **1.32 BG** | **Garvies Point equal to 13.3% of total 2020 water demand** |
| | | | | |
| Current top 10 water consumers in 2020 in Glen Cove (7 out of 10 are commercial/ residential properties) | | **102.8 MG** | | **9.3% of total 2020 water demand for the City of Glen Cove attributed to the top 10 water consumers** |

*Note: The projected daily and annual water demand for Garvies Point were taken from – VHB, December 24, 2020, PUD Amendments letter submitted to City of Glen Cove Planning Board. However, the numbers for Garvies Point East, Phase 2, were recalculated to include potential buildout of both Konica and 1 Garvies Point Road properties in VHB: Conceptual Build-Out of the 1 Garvies Point Road Property or Konica Minolta Property Supplemental Analysis p.105. https://glencoveny.gov/wp-content/uploads/2021/04/PUD-Amendment-Supplemental-Analysis-March-2021.pdf.*

### *The City of Glen Cove and Locust Valley WD*

The Annual Water Conservation Reports by the City of Glen Cove show that water pumpage increased each year from 2018 through 2020. In addition, water purchased from Locust Valley over the same period also went up. This is shown in Table 12.

**Table 12: Glen Cove Water Demand Plus Water Purchased from Locust Valley WD**

| YEAR | Glen Cove Annual Water Pumpage* | Water Purchased from Locust Valley* | Total Water Demand/Yr. without Garvies Point Projections | Total Water Demand/Yr. with Updated (2021) Garvies Point Projections |
|---|---|---|---|---|
| 2018 | 1.278 BG | 27.523 MG | 1.305 BG | |
| 2019 | 1.314 BG | 22.414 MG | 1.336 BG | |
| 2020 | 1.342 BG | 49.566 MG | 1.392 BG | **1.495 BG** |

**Source: Annual Water Conservation Reports, City of Glen Cove and Locust Valley WD.*

It is now possible to see what the future impact the Garvies Point project will have on Glen Cove's water. To the 1.392 billion gallons in total water demand for 2020, add the projected water demand of 175 **million gallons** per year for Garvies Point development. The total annual water demand in Glen Cove would increase to **1.495 billion gallons,** based on 2020 pumpage.

The above analysis addressed only the potential impact of the Garvies Point projects. Table 6 lists all the current projects under consideration for the City of Glen Cove. The cumulative impact of all the projects together has not been analyzed, but it will likely be substantial. Also, the analysis considered only water demand due to the units and facilities planned. The projected water use stated in the 2021 Amended PUD does not include ancillary water use such as for irrigation around the properties. The proposed domestic water demand that was included in this document does account for additional commercial water usage, such as for restaurants.

***How Will Glen Cove and Locust Valley WD Be Able to Reduce Their Water Demand by 15%?***

Glen Cove reported that its average water use for 2018-2020 was reduced by **5.6%** or approximately **42 million gallons** when compared with its water use in 2012, the benchmark year for reaching the 15% reduction goal set by the DEC. (See Table 5.) The water demand from Garvies Point alone could create more than 175 million gallons of new water demand. This growth in water demand would eliminate the 42 million gallons of saved water and instead create a **shortfall of 133 million gallons** that would require additional pumpage to meet demand. If half of this shortfall, or 67 MG, occurred in the summer peak season, it would make it nearly impossible for Glen Cove to reach the goal of a 15% reduction in water demand.

For Locust Valley WD, each year from 2018 to 2020, total water withdrawals increased. Water sold to Glen Cove also increased over the same years. Water pumpage in Locust Valley increased by **nearly 10%** (instead of decreasing over this period) when compared with 2012 pumpage. If Locust Valley were to increase its pumpage further to meet the increased demand in Glen Cove, its ability to reduce water pumpage by 15% would be impossible.

***Full Build-Out for Glen Cove***

In addition to the Garvies Point development, other Glen Cove development projects have been proposed or completed. They include the Livingston/The Villa (176 units), Village Square (146 units), and the Orchard Neighborhood (50 units). The three additional projects could add approximately 372 more units to the mix. If the population for the three projects is estimated at 2 people per unit, the total would be 744 additional residents. The water demand for the additional 744 residents (applying the calculation used for Garvies Point at 165 gallons per person per day) would reach 122,760 gallons per day or **44.8 million gallons per year** to the water demand of the City of Glen Cove. The net effect of the three additional projects would be to further strain the water availability of the city and possibly Locust Valley Water District as well.

To date, it is unclear on how the City of Glen Cove will manage the new water demand.

**Roslyn WD**

Like the City of Glen Cove, the Roslyn WD serves a large area, and its annual water withdrawals from the aquifers have increased from the 2012 withdrawal in two of the three years from 2018 to 2020 (see Table 1). Table 5 compares summer pumpage in 2012 with peak season pumpage for years 2018 – 2020. Overall, water pumpage during the peak season **increased by 5.6**% rather than decreased.

Table 9 lists the four projects proposed in the Roslyn WD service area. The total number of units so far proposed is 257. Although final details about some of these projects are a year or more away, potential water use can be projected. If the population for the units is estimated at 2 people per unit, there could be an increase of 514 additional residents. Again, applying the same calculations used for Garvies Point, if each person used 165 gallons per day, the daily water demand would be 84,810 gallons per day. The annual total water demand would be about **31 million gallons per year** in additional water needed for the projects.

Since water demand in the Roslyn WD is going up, an additional 31 million gallons per year in demand would make it even more difficult for Roslyn to meet the 15% water use reduction goal.

It should not be assumed that the Roslyn WD has ignored or failed to try to conserve water. In fact, it has implemented some of the most progressive steps and policies of any of the water districts under review. But the ability to control new growth and development is not in its hands under the procedures used today to evaluate available water for new projects.

**Port Washington WD**

Table 10 lists the only major project proposed along the Hempstead Harbor side of Port Washington. The project, at 145 West Shore Road, is a 7-story residential building and marina complex. The residential design calls for 80 units with one-bedroom; 82 units with 2-bedrooms; and 14 units with 3-bedrooms. The marina will have 30 boat slips available with water and wastewater services provided for each slip.[6]

The DEIS for the West Shore Residences project estimates that for the design alternative favored by the builder, the total population of the building will be 378. The project water use is estimated to be 46,650 GPD plus an additional irrigation demand of 4,665 GPD for a total daily water demand of 51,315 GPD.[7] This amount of water demand would generate an annual water demand of 18,729,975 gallons per year of additional water needed to serve the customers of the Port Washington Water District.

In 2020, the Port Washington WD pumped 1.320 billion gallons of water (see Table 2). An additional increase of over 18 million gallons per year due to the West Shore Residences project is an increase of 1.4% above the pumpage in 2020. Since Port Washington was only able to reduce peak pumpage by 1.1 %, the new demand from the West Shore Residences will eliminate the hard-earned water savings achieved by Port Washington and make it extremely hard to bring down overall water pumpage by even 5%, not to mention the 15% water reduction goal. (Note that in summer 2022, the Port Washington WD announced stringent water conservation

measures due to the summer drought and the need to take wells offline to construct treatment systems to address emerging contaminants. Residents were required to reduce irrigation by 20%.[8])

**Table 13: Summary of Projected Impact from 145 West Shore Road on Port Washington Water Supply**

| 145 West Shore Road Proposed Development | Projected Daily Average Demand | Projected Annual Demand | 2020 Annual Pumpage for Port Washington | Projected 145 West Shore Road Water Demand as a % increase over Port Washington's 2020 Pumpage |
|---|---|---|---|---|
| 176 (1 – 3 bedroom units) | 51,315 GPD | 18,729,975 | 1.320 BG | 1.4% |
| Projected total occupancy = 378 | | | | |

**Source: West Shore Residences, DEIS, 8-2022, p. 207.*

## VII. WHAT IS NEXT FOR WATER SUPPLIERS AROUND HEMPSTEAD HARBOR?

This report has reviewed water use from available documents provided by seven water suppliers for the years 2018 – 2020. Three of the seven suppliers were able to reduce water use in the peak season by a modest amount (City of Glen Cove, Glenwood,[9] and Port Washington; see Table 5). Four suppliers reported an increase in water use for the same three-year period. It was noted that the peak month for water demand is July. The years 2018 and 2019 were relatively normal years in temperature and precipitation. However, 2020 was hotter than normal. What can happen when an unusual year comes along?

In July of 2020, Long Island experienced a hot spell, with several days in the 90-degree range. In response, Nassau County opened cooling centers. Many water suppliers struggled to meet soaring water demand The Port Washington Water District asked their customers to cut back on water use. Other water suppliers around Long Island were reporting extremely high or record levels of water demand. The Water Authority of Western Nassau reported a pumpage level just short of its maximum record of 18.33 million gallons a day. The Suffolk County Water Authority reported their highest pumpage rate ever, at 545,000 gallons per minute for their entire system. This would produce 32 million gallons of water per hour.[10] The impact of the heat wave is reflected in the jump in water withdrawals for 2020 recorded by all seven water suppliers reviewed in this report. The 2022 summer was more extreme than 2020. It included an extended heat wave with very dry conditions. Long Island was officially declared to be in a severe drought in July 2022. Drought conditions extended into October. Many water suppliers asked customers to reduce water use. Some water suppliers declared drought emergencies and asked customers to stop watering lawns.

Long Island will not always be so lucky as to have normal temperatures and precipitation each year. If the water supply for various communities is over-allocated, then during the exceptional years, we could see the undesirable consequences, such as saltwater intrusion, dried up streams and ponds, and less groundwater water discharge to coastal waters, which can in turn upset normal temperature, alkalinity, and salinity conditions.

Local communities are now at the proverbial fork in the road. Two paths lie ahead. Do communities choose to take active measures to rein in high water demand, or do they hope for the best and choose the *status quo*, putting off the hard decisions until it is too late? In addition, how will the NYS DEC handle the likelihood that numerous water suppliers are unable or unwilling to take firm measures to reduce peak season demand. Will the DEC demand new policies from local governments to help suppliers? Will the DEC take a harder line on over-pumping?

**Worst-Case Scenario**

For an area like Long Island that has long expected a generous yearly rainfall level of about 45 – 46 inches of rain, it is hard to imagine how dreadful things can get. Las Vegas, Nevada, is an example that could provide a snapshot of what a worst-case scenario might look like. As one of the fastest growing regions of the country for decades, Las Vegas is experiencing a drought that has lasted 20 years. The abundant water it relies on from the Colorado River is a thing of the past. The river and the reservoirs, like Lake Mead behind the Hoover Dam, are at the lowest level since the reservoir was first filled in 1937. Last year, the state of Nevada adopted a law banning "nonfunctional" turf, including home lawns and grassy strips along roadways. This year home lawns were actively removed. Eliminating 3,900 acres of grass will save 9.5 billion gallons of water annually for the area, which is about 10% of the water drawn from the Colorado river system each year.[11] Long Island is not in such a serious situation yet, but like most regions of the US, water is never an unlimited supply and certain restraints are necessary to maintain a sustainable water supply. Long Island has not succeeded in even the baby steps necessary to wisely use the groundwater supply.

## VIII. POTENTIAL IMPACTS TO HEMPSTEAD HARBOR WATER QUALITY

The water quality and conditions within Hempstead Harbor itself are as important as the impact that new construction will have on the drinking water supply. The addition of more hardened surfaces surrounding the harbor will potentially contribute more runoff unless projects have effective stormwater control measures. The Coalition to Save Hempstead Harbor (CSHH) noted in its comments on the PUD Amendments[12] that the previous design for stormwater retention was inadequate and requested that the designs be updated to retain an 8-inch storm (the Nassau County criteria) rather than the current 2-inch stormwater retention design.

Runoff often brings increased bacterial loads into the harbor. CSHH has documented increases in bacteria from outfalls in Glen Cove Creek and other areas that drain into the harbor. (A factor contributing to the elevated bacteria was the discovery in 2021 of a sewer line break that drained into Mill Pond and then into the creek.) When bacteria levels are high, the use of the harbor as a recreational area is affected and beaches are closed. After so much work over the past 35 years to improve the environmental conditions in Hempstead Harbor, it would be tragic to see conditions deteriorate once again.

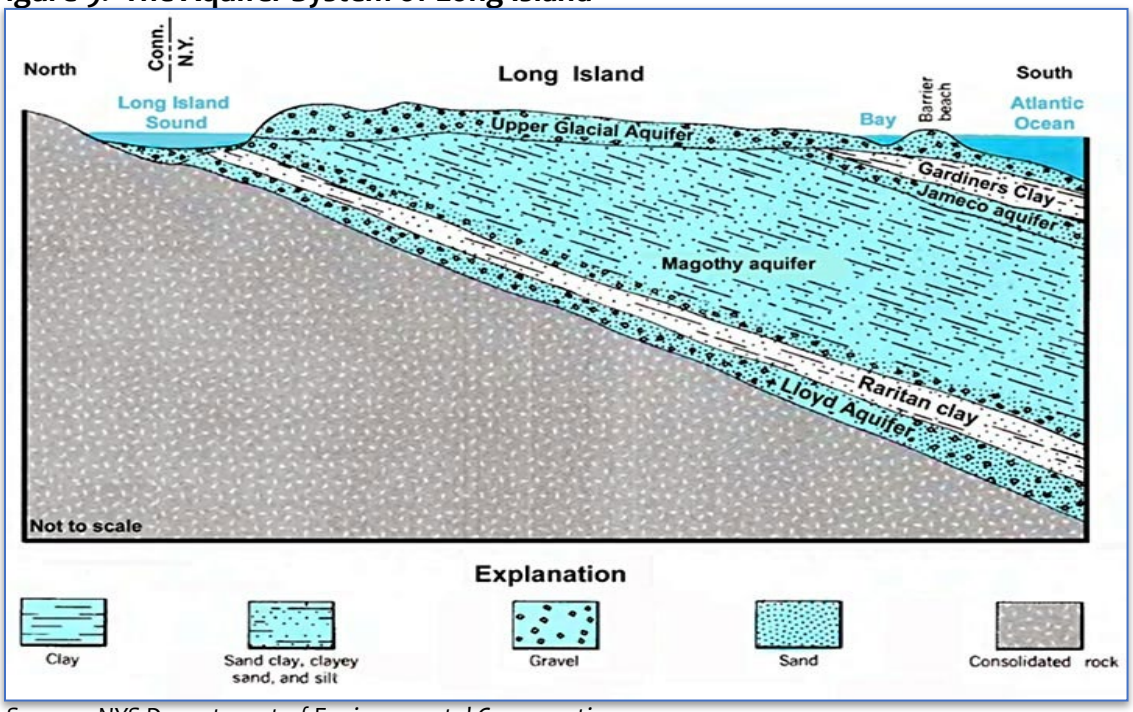
Fertilizers and other nutrients in runoff can contribute to algal blooms and depleted oxygen levels in harbor water, making it unhealthy for aquatic life. The contribution of underflow of fresh groundwater into the bottom of the harbor helps to balance the ecosystem salinity. If groundwater underflow seeping into the bottom sediments and waters of the harbor is reduced due to excessive pumping of the aquifers, the salinity in the shallower parts of the harbor may increase.

## IX. WHY IS WATER CONSERVATION AND MANAGEMENT IMPORTANT?

Change takes time. Changing human behavior is far harder than letting a technological fix do the work. There are some technologies that can help, such as using "smart irrigation controllers" that more precisely match the need for water with conditions such as recent precipitation, humidity, type of soil, and other variables so that overwatering is prevented.

A rarely discussed aspect of water supply is that not all aquifers are equal across Long Island. The aquifer system along Nassau County's north shore does not store as much water as the same aquifer stores along the south side of the county. This is because the north shore formations themselves are shallower and thinner. By definition, this means that there is less total water stored and available to be withdrawn without creating "undesirable consequences," which is how water sustainability is defined.

**Figure 9: The Aquifer System of Long Island**




*Source: NYS Department of Environmental Conservation.*

In Figure 9, the diagram of the aquifer system of Long Island shows that the aquifer layers on the north shore along Long Island Sound are thinner than they are along the Atlantic Ocean. The bedrock is about 400 feet deep on the north shore and 1,500 feet deep or more along the south shore such as beneath Long Beach. Thus, with less total groundwater storage available

for the north shore, communities there may need to take more urgent water conservation action before others.
The "undesirable consequences" are responses that occur in the aquifers when too much water is removed. The consequences include salt water intrusion, which is already a serious concern along the north shore. Also, increased water withdrawal helps spread existing contamination plumes through more of the aquifers. The result is that more water suppliers may have to install expensive treatment systems to make the water drinkable – something that is also occurring. This makes water more expensive for everyone. When the water table drops, streams and ponds dry up and plants and wildlife can die. This can affect the ecological value and aesthetics of a favorite park. A lowering of the water table also leads to a smaller amount of water draining into estuaries and coastal waters, upsetting the health and balance of these important ecosystems.

For all the reasons presented and more, water conservation and management are key strategies for keeping the water supply plentiful and affordable.

## X. FINDINGS

By reviewing the many new development projects in the communities around Hempstead Harbor, the impact that these projects can have on the local water suppliers becomes clear. Without a regional effort by all the communities together, it will not be possible for these communities to substantially reduce their summer water use or reach the 15% reduction goal.

The following findings help to describe the challenges facing the communities served by the seven water suppliers surveyed in this report. The findings are:

1. A substantial increase in water withdrawals for 2018 – 2020 far exceeded the modest water reductions among the seven water suppliers surveyed. Three of the seven water suppliers reported a significant increase of 4 – 10% in water use over the three years studied. Two water suppliers reported very modest declines in water withdrawals.

Water withdrawal increases (compared with 2012 pumpage) were reported by Sands Point (0.6%); Sea Cliff (3.6%); Roslyn (5.6%); and Locust Valley (9.8%) water districts. For both Roslyn and Locust Valley, a contributing factor was the sale of water to other communities outside their service areas.

The three water suppliers that reported a decrease in water withdrawals were: Glen Cove (5.6%); Glenwood WD (19.3%); and Port Washington WD (1.1%). There were extenuating circumstances in the case of Glenwood WD and the City of Glen Cove.

A. The City of Glen Cove documented a much higher amount of water use in 2012 than water use today, and this worked in the city's favor. Also, the city's water supply was supplemented by Locust Valley, and the extra water was not attributed to Glen Cove pumpage.

B. Glenwood WD had the largest reduction; however, a major water consumer, the Glenwood Landing Power Plant, began decommissioning a substation, resulting in a decrease in water demand and pumpage.

C. Port Washington WD had a modest reduction even though it actively promoted programs to bring down water demand.

2. For those areas experiencing new proposals for development, in most cases, the full impacts of the projects have not yet been fully felt by the water suppliers. The added new water demand will make it extremely difficult to successfully reduce water use in the coming months and years.

3. Increased water demand due to new development does not appear to be a significant factor in evaluating the impact of new projects around the region through the SEQRA process. The current system of using "letters of water availability" from individual water suppliers does not reflect the ability of the water supplier to bring down water use now or in the future. This is a flaw in the environmental impact review process.

The need for water conservation has not reached the awareness of most residents in the area.

4. The total amount of water available from the aquifer system is smaller along the north shore, due to the thinner and shallower dimensions of the aquifers, than other parts of Nassau County. Some of the communities along Long Island Sound are on peninsulas. The narrow and elongated shape of the peninsulas can make it harder for groundwater to flow into the peninsulas and replenish the aquifers. Thus, the long-term sustainability of groundwater needs to be considered in order to avoid unwanted consequences such as saltwater intrusion, lowering of the water table, loss of stream flow, and less groundwater discharge into coastal waters such as Hempstead Harbor.

## XI. RECOMMENDATIONS

Long Island is one of the few areas in the nation where water demand is increasing. Most large metropolitan areas have achieved impressive water demand reductions over the years.

This report analyzed how water is used within the seven water districts servicing the Hempstead Harbor area. It has shown that development is still occurring that will raise water demand and water use above where it is today. However, active measures to bring water demand down to sustainable levels are rare or absent. This is not an issue that rests solely on water suppliers. All those entities that have a role in growth and water management are part of the process and part of the solution. This includes local town, city, and village governments, planning and zoning departments, developers, the county planning department, state agencies such as the DEC, and interested organizations and citizens.

There is plenty of action needed. The following are recommendations for change, in response to a serious water problem. **These are recommendations for action, now.**

1. The water problem along Hempstead Harbor is not the responsibility of a single community or supplier. It is a regional problem, and it needs a regional response. Before additional development is approved, a moratorium should be established by all the affected local governments for at least one year, with additional extensions available to craft and adopt stronger policies and protocols to bring water use under control.

2. During the moratorium period, the following issues need to be raised and resolved:

A. Each community should define the amount of water that represents a 15% reduction in water use and set that amount as the local water conservation goal. The number will vary from district to district, but the 15% goal will be a shared goal.

B. Each community should evaluate what measures can be taken as a community to help reach the 15% conservation reduction. Each community can craft its own list of actions, or there can be a regionally accepted list. Then, a strategy should be developed to gain community support, cooperation, and engagement. This is not an effort left solely to the water districts. It will take everyone.

C. In some cases, communities may wish to update their local master plans. This will allow agreement on issues of community growth, carrying capacity, build-out potential, as well as how local zoning encourages or discourages achieving the 15% conservation goal.

D. Along with the master plans, other policies or ordinances can be considered, such as those related to yard or lawn size; the area to be planted in turf; grass choices; protections for homeowners who choose to rewild their properties; tree coverage; water recharge options such as swales and rain gardens; pervious pavements; and many other well-known water-conservation practices being used around the county.

E. The communities can also petition their local state representatives and ask for state legislation requiring annual reports from the NYS DEC on water use by region, county, townships, and villages, as well as by individual water supplier. That information is not available from the DEC on an annual basis. The absence of regular information on water use tends to obscure the issue regionally.

F. Communities can also establish certain water conservation design specifications for local development projects, such as the latest water-conserving fixtures, landscaping designs that do not need irrigation, rain catchment systems for certain irrigation purposes, native plantings, substituting pervious for impervious pavement for parking areas, walkways, and other hard surfaces to reduce runoff and increase infiltration. These options may be incorporated in building codes.

G. Local governments can sponsor public education sessions to inform residents why conservation is needed and how they can help. Ask for their participation. Publicize progress on meeting the 15% goal.

H. In reviewing development proposals, local governments need to change what information is necessary to confirm that the local water supply is sufficient and available. This is known as the "letter of water availability" that each water system produces to confirm that it can service a potential developer. The letter of availability should be revised to include the success to date that each supplier is having in reaching the 15% water conservation goal. This information should be considered when making approval decisions for new developments.

I. For developers seeking approvals for water availability in districts that are not making progress in meeting conservation goals, approvals could be contingent upon requiring developers to sponsor projects that will create water savings as a trade-off that would allow water for the new projects. For example, developers could retrofit a municipal building or facility, so it uses less water. The actual water savings could be credited to the developer.

J. Local governments can adopt their own ordinances or agree to enforce the watering rules established by the county. Without active enforcement, the rules have no teeth. Also, they can reduce watering to one day a week.

K. The NYS DEC should be more proactive in pushing for real water conservation results. A deadline for reaching the 15% goal should be announced. Also, the DEC should confirm the 2012 benchmark year for purposes of water conservation tracking. Again, the DEC should annually report on the progress by each water supplier toward reaching the 15% conservation goal.

L. A practice that some water suppliers are using already is to define the size of a yard that can be irrigated and include the limits in water service agreements.

M. Nassau County has been a leader on water conservation efforts since its first water conservation ordinance in 1987. In 2016, the county issued its water conservation ordinance to require all residents using lawn irrigation systems to include devices that have moisture sensors to stop irrigation when it has rained. Since then, more advanced systems are now available that connect to weather services and that have more programmable features. All water suppliers in Nassau County should update their own rules to require the use of these advanced, "smart" sprinkler controllers that help reduce unnecessary watering. In 2019, Nassau County also adopted a rebate program to offset the expense of installing the new controllers.

N. In 2019, Nassau County authorized the preparation and publication of the annual "Groundwater and Public Water Supply Facts Report." (A similar annual report series was terminated by the Nassau County Department of Health in 1999.) This report provides a wealth of detailed information for everyone interested in what is happening from year to year regarding groundwater in Nassau County. The reports should have been reintroduced in 2020, but the COVID pandemic caused

the reports to be delayed. Now, it is time for this important public information to again be available to all residents in Nassau County.

3. Water conservation should become a valued ethic across all of Long Island. Competitions, challenge grants, and other creative approaches are possible to make water conservation a part of the fabric of the area.

The average Long Island resident is unaware of the need to reduce water use. Having a green, beautifully manicured yard is a common expectation of Long Islanders, no matter how much water and chemical support it takes. Water features and swimming pools are all part of the modern lifestyle that take a lot of water. Providing these amenities without building in water conservation is a pattern of excess that needs to change. Why? Because, how we are living now is unsustainable.

## APPENDIX A

Table A-1 presents the percentage change between 2012 peak pumpage and the average peak pumpage for 2018 – 2020. The goal is to achieve a 15% reduction in peak season pumpage when compared with that of 2012. The table provides the data for how the calculations are made. The average of the peak pumpage for 2018 – 2020 is compared to the peak pumpage for 2012 and converted to a percentage of change.

**Table A-1: Comparison of 2012 Peak Season Pumpage with the 2018 – 2020 Average Peak Season Pumpage**

| WATER SUPPLIER | 2012 PEAK PUMPAGE May – Sept. | 2018 PEAK PUMPAGE May – Sept. | 2019 PEAK PUMPAGE May – Sept. | 2020 PEAK PUMPAGE May – Sept. | 2018 - 2020 PEAK PUMPAGE AVERAGE May – Sept. | PERCENT CHANGE 2012 vs 2018 – 2020 |
|---|---|---|---|---|---|---|
| **Locust Valley WD** | **441.972 MG** | 469.897 MG | 454.799 MG | 530.549 MG | **485.081 MG** | Average **increase** of 485.081 – 441.972 = 43.109 MG or **+9.75%** |
| **City of Glen Cove WD** | **756.811 MG** | 697.068 MG | 704.718 MG | 741.438 MG | **714.312 MG** | Average **reduction** of 756.811 – 714.312 = 42.499 MG or **5.6 %** |
| **Sea Cliff WD** | **264.686 MG** | 271.855 MG | 252.287 MG | 292.395 MG | **272.179 MG** | Average **increase** of 272.179 – 264.686 = 9.493 MG or **+3.586 %** |
| **Glenwood WD*** | **36.746 MG** | 29.775 MG | Data Missing * | 29.543 MG | **29.659 MG** | Average **reduction** of 36.746 – 29.659 = 7.087 MG or **19.28%** |
| **Roslyn WD** | **737.833 MG** | 789.341 MG | 744.944 MG | 803.227 MG | **779.170 MG** | Average **increase** of 779.107 – 737.833 = 41.337 MG or **+5.6 %** |
| **Port Washington WD** | **743.878 MG** | 719.695 MG | 722.844 MG | 764.575 MG | **735.704 MG** | Average **reduction** of 743.878 – 735.704 = 8.175 MG or **1.09%** |
| **Sands Point WD** | **271.160 MG** | 244.342 MG | 266.832 MG | 266.832 MG | **272.856 MG** | Average **increase** of 272.856 – 271.160 = 1.696 MG or **0.625%** |

**Glenwood WD 2019 Pumpage Report with monthly pumpage amounts is not available. Only 2018 and 2020 monthly pumpage is used for this chart.*

*Source: Based on data from NYS DEC FOIA request on water caps, 2012 pumpage data; and annual pumpage reports by each water supplier for 2018, 2019, and 2020.*

## APPENDIX B

### THE AQUIFER EQUILIBRIUM EQUATION

*By Sarah Meyland, MS, JD, for the Coalition to Save Hempstead Harbor*

To correctly state and understand how the groundwater system on Long Island works, one must first correctly state the relationships that influence the groundwater system. The groundwater system seeks to be a balanced system where:

Inflow = Outflow +/- Storage.

In this equation, first note that when this equation correctly describes the groundwater system, that system is **hydrologically balanced**. It is in a state of **dynamic equilibrium**.

***Inflow*** means water is entering the aquifer system. Normally, this is assumed to be freshwater derived from precipitation falling on the land surface of Long Island. However, when the system is seeking equilibrium, it also may be saltwater from the surrounding surface water, entering the aquifer, which is described as saltwater intrusion.

Second, the term ***Outflow*** includes the many ways that groundwater leaves the aquifer system. Outflow includes discharge to streams and ponds, underflow discharge into coastal saltwater bodies, and groundwater withdrawals by pumping.

***Storage*** is the term that recognizes that an aquifer acts as a large water storage container. Groundwater pumped from the aquifer is coming from the water stored in the sandy deposits of the aquifer. Storage helps the aquifers to stay in equilibrium between inflow and outflow when conditions may change.

The DEIS statement suggests that the relationship where **inflow ≥ pumpage** means the aquifer is safe. This is not true. Why? Because pumpage is not the only outflow of importance. To determine if an aquifer is hydrologically healthy is to account for all of the outflow and change in storage and match it to the water coming into the aquifers or inflow.

The 2005 Nassau County DPW report, "Nassau County Groundwater Monitoring Program," addresses the process of dynamic equilibrium on page 7. The report states:

> "Changing conditions, such as increases in water withdrawn from the aquifers to satisfy public water demand and fluctuations in the amount of recharge, are the two main factors that affect the behavior of the groundwater system. Since the flow of water into the groundwater system will always be in balance with the flow out of the system, these changes cause the groundwater system to constantly strive to reach a new equilibrium state. The groundwater system is therefore considered to be in a state of "dynamic equilibrium" as it continually adjusts to change."

The 2005 report continues to explain how the groundwater system adjusts to changing conditions:

> "With the great ability the aquifers have to adjust to the impacts of development and to re-establish equilibrium, the flow into the groundwater system still remains in balance with the flow out of the system. The adjustments that the groundwater system made in seeking a new state of equilibrium in response to development include reduced streamflow during dry weather conditions, reduced underflow from the aquifers to the surrounding saltwater bodies, and a permanent lowering of the water table resulting from the installation of sanitary sewers. Thus, the two major environmental impacts of development are reduced streamflow and surface water levels in ponds, and altered movement of the saltwater interfaces along the north and south shores of the County" (p. 7).

In terms of groundwater management, the adjustments that occur in the aquifers to reach a new equilibrium are considered to be the negative and the undesirable consequences of excessive withdrawal of groundwater from the aquifer system.

In fact, it is the significant growth in groundwater pumpage that upsets the equilibrium of the aquifers and causes the negative responses such as loss of stream flow, drop in water tables, loss of surface water and reduced outflow into coastal waters. The way the aquifers increase inflow in order to achieve a new equilibrium is by allowing saltwater intrusion into the aquifers. The saltwater thus becomes an inflow part of the equilibrium formula. This is a serious, negative consequence that damages the long-term sustainability of the groundwater supply in Nassau County.

To make the point clear, it is the **total loss** of water from the aquifers due to outflow that is the important relationship and not simply the impact of pumping alone. Water is leaving the aquifers all the time. Groundwater withdrawals due to pumping only add to the total amount of water lost from the system and upsets the natural equilibrium. It does not take pumping to reach the level of total recharge to upset the aquifers – the impact occurs long before "recharge = pumping" is reached.

The DEIS concludes that the water requirements of the project and increased pumpage required by the development have no impact on the groundwater supply. This is not true. The new water demand it represents will contribute to negative impacts noted above in the DPW report on page 7 – loss of stream flow, reduced underflow, lowering of the water table and increased saltwater intrusion. Of equal concern is that these changes will also have the effect of spreading existing contamination within the aquifer system, putting additional public water supply wells at risk.

## REFERENCE LIST


Breault, Robert F., John P. Masterson, Christopher E. Schubert, and Liv M. Herdman. *Managing Water Resources on Long Island, New York, with Integrated Multidisciplinary Science*: U.S. Geological Survey Fact Sheet 2021 – 3044, 2021.

Coalition to Save Hempstead Harbor. Letter to Glen Cove Planning Board, CSHH Comments Re: RXR's Amended PUD Plan for Blocks D, E, F, October 17, 2021. See https://coalitiontosavehempsteadharbor.org/wp-content/uploads/CSHH-comments-on-PUD-Amendment-for-DEF-10.17.21.pdf.

Buxton, Herbert T., and Douglas A. Smolensky. *Simulation of the Effects of Development of the Ground-Water Flow System of Long Island, New York*: U.S. Geological Survey Water-Resources Investigations Report 98 – 4069, 1999.

Chinese, Vera. "Water Usage Causes Concern." *Newsday,* July 21, 2020.

Choi-Schagrin, Winston. "Water Levels Have Fallen to Dire Low in Lake Mead." *The New York Times,* July 23, 2022.

Fountain, Henry. "Where Water's Scarce, Lawns Are Cut Out and Carted Away." *The New York Times,* May 4, 2022.

Konikow, Leonard F. *Groundwater Depletion in the United States (1900 – 2008)*: U.S. Geological Survey Scientific Investigations Report 2013 – 5079, 2013.

Leung, Tony. Letter to Public Water Suppliers: New York State Department of Environmental Conservation, January 5, 2016.

Long Island Power Authority. *Glenwood Overhead 69Kv Transmission Line Relocation and Glenwood Power Stations Decommissioning and Demolition Project; SEQRA Environmental Impact Assessment*: TRC Engineering, Consulting and Construction Management, Lyndhurst, NJ, pg. 1-12, and 4-2, June 2012. https://hempsteadharbor.org/applications/DocumentLibraryManager/HHPCupload/LIPA EAF for demolition of GW Power Station 12-21-11.pdf.

Meyland, Sarah J. Presentation to the Committee on Water Resources Regarding Water Caps. Nassau County Legislature: New York State Legislative Commission on Water Resource Needs of Long Island, 1986.

Misut, Paul E., and Omkar Aphale. *Simulation of Groundwater Flow Pathlines and Freshwater/Saltwater Transition Zone Movement, Manhasset Neck, Nassau County, New York*: U.S. Geological Survey Scientific Investigations Report 2013 – 5210, 2014.

Misut, Paul E., Nicole A. Casamassina, and Donald A. Walter. *Delineation of Areas Contributing Groundwater and Travel Times to Receiving Waters I Kings, Queens, Nassau and Suffolk Counties, New York*: U.S. Geological Survey Scientific Investigations Report 2021 – 5047, 2021.

*Nassau County Department of Health Ground Water and Public Water Supply Facts for Nassau County, New York*, 1998.

Nassau County Ordinance No 248 – A – 1987. An Ordinance with respect to establishing a Comprehensive Plan for Water Conservation and regulation of water throughout Nassau County, including provisions for enforcement thereof, pursuant to Article XII of the county government law of Nassau County. (Adopted June 8, 1987)

Nassau County Ordinance No 42 – 2016. An Ordinance to Amend Ordinance No 248 – A – 1987 to require rain-sensor devices for automatic lawn irrigation systems.

Nassau County Resolution No 409 – 2019. A Resolution to establish a Nassau County reimbursement program for the installation of "smart sprinkler" systems.

Nassau County Local Law------ 2019. A Local Law to amend the Nassau County Administrative Code to establish an annual report to Nassau County on the current conditions of the groundwater and public water supply systems.

New York State Department of Environmental Conservation FOIA Request
- City of Glen Cove Pumpage Report for 2012
- Glenwood Water District Pumpage Report for 2012
- Locust Valley Water District Pumpage Report for 2012
- Port Washington Water District Pumpage Report for 2012
- Roslyn Water District Pumpage Report for 2012
- Sands Point Water District Pumpage Report for 2012
- Sea Cliff Water District (New York American Water) for 2012

New York State Department of Environmental Conservation Water Conservation Annual Reports from DECinfoLocator for:
- City of Glen Cover, 2018 – 2020
- Glenwood Water District, 2018 – 2019
- Locust Valley Water District 2018 – 2020
- Port Washington Water District, 2018 – 2020
- Roslyn Water District, 2018 – 2020
- Sands Point Water District 2018 – 2020
- Sea Cliff Water District (New York American Water) 2018 – 2020

New York State Department of Environmental Conservation Annual Pumpage Reports, 2018 – 2020, where available from DECinfoLocator for:
- City of Glen Cove
- Glenwood Water District
- Locust Valley Water District

Port Washington Water District
Roslyn Water District
Sands Point Water District
Sea Cliff Water District (New York American Water)

Roslyn Water District Urges Conservation. *The Port Washington Times,* July 16, 2021.

Serkin, Les. "Geology." In *Hempstead Harbor, Its History, Ecology, and Environmental Challenges*, ed. by John Waldman and Carol DiPaolo, 7-20. Coalition to Save Hempstead Harbor, 1998.

Stumm, Frederick, Andrew D. Lange, and Jennifer L. Candela. *Hydrology and Extent of Saltwater Intrusion on Manhasset Neck, Nassau County, New York*: U.S. Geological Survey Water-Resources Investigation Report 2000 – 4193, 2002.

Stumm, Frederick, Andrew D. Lange, and Jennifer L. Candela. *Hydrology and Extent of Saltwater Intrusion in the Northern Part of the Town of Oyster Bay, Nassau County, New York: 1995 – 98*: U.S. Geological Survey Water-Resources Investigation Report 03 – 4288, 2004.

Stumm, Frederick, Michael D. Como, and Marie A. Zuck. *Use of Time Domain Electromagnetic Soundings and Borehole Electromagnetic Induction Logs to Delineate the Freshwater/Saltwater Interface on Southwestern Long Island, New York, 2015 – 17*: U.S. Geological Survey Open-File Report 2020 – 1093, 2020.

Tagliaferri, Tristen N., Shawn C. Fisher, Christopher M. Kephart, Natalie Cheung, Ariel P. Reed, and Robert J. Welk. *Using Microbial Source Tracking to Identify Fecal Contamination Sources in an Embayment in Hempstead Harbor on Long Island, New York*: U.S. Geological Survey Scientific Investigations Report 2021 – 5042, *2021.*

Veatch, A.C., Charles Sumner Slichter, Isaiah Bowman, W.O. Crosby, and R.E. Horton. *Underground Water Resources of Long Island, New York*: U.S. Geological Survey, Professional Paper No. 44, 1906.

Valenti, John. "Nassau Opens Cooling Centers as Temps Hit 90." *Newsday,* July 21, 2020.

VHB, PC. *City of Glen Cove/Garvies Point – PUD Amendment*, December 16, 2020.

*VHB, PC, Conceptual Build-Out of the 1 Garvies Point Road Property or Konica Minolta Property Supplemental Analysis, March 2021, p.105.* https://glencoveny.gov/wp-content/uploads/2021/04/PUD-Amendment-Supplemental-Analysis-March-2021.pdf.

VHB, PC, West Shore Residences, Port Washington, Town of North Hempstead, DEIS, August 2022.

Village of Sands Point, Water Emergency Announcement, July 1, 2021.

Walter, Donald A., and Jason S. Finkelstein. *Distribution of Selected Hydrogeologic Characteristics of the Upper Glacial and Magothy Aquifers, Long Island, New York*: U.S. Geological Survey Scientific Investigations Report 2020 – 5023, 2020.

Walter, Donald A., John P. Masterson, Jason S. Finkelstein, Jack Monti, Paul E. Misut, and Michael N. Fienen. *Simulation of Groundwater Flow in the Regional Aquifer System of Long Island, New York, for Pumping and Recharge Conditions in 2005 – 15*: U.S. Geological Survey Scientific Investigations Report 2020 – 5091, 2020.

Williams, John H., Madison Woodley, and Jason S. Finkelstein. *Aquifer Transmissivity in Nassau County, Queens and Kings Counties, New York, Estimated from Specific-Capacity Tests at Production Wells*: U.S. Geologic Survey Open-File Report 2020 – 1108, 2020.

## ENDNOTES

[1] In 1986, the NYS Department of Environmental Conservation established the Nassau County Water Caps program. It set limits on groundwater withdrawal for nearly all public water suppliers in the County. Using an annual water withdrawal limit or "cap" and a 5-year running cap, water suppliers were asked to slowly bring down water withdrawals and stay within the withdrawal caps established by the program. The cap withdrawal limits would gradually reset to lower amounts as water conservation was achieved. However, some water suppliers challenged the program through litigation. When the legal challenges succeeded, the program lost momentum and the caps were never utilized to establish a gradual decline in water use. The caps as first established still exist but have not been updated since their original proposal.

[2] Tony Leung, June 5, 2016, Letter to Water Suppliers, NYS Department of Environmental Conservation.

[3] Ibid.

[4] Ibid.

[5] Garvies Point, PUD Amendment, 12-6-2022; Attachment B, 12-4-2020.

[6] West Shore Residences, DEIS, 8-2022; https://www.northhempsteadny.gov/filestorage/16281/16283/16285/West_Shore_Residences_DEIS.pdf.

[7] West Shore Residences DEIS, Ibid., pg. 207).

[8] See Port Washington Water District, https://pwwd.org/conservation/water-conservation/.

[9] The water use in Glenwood WD, which noted a 19% reduction, was influenced by extenuating circumstances.

[10] Chinese, Vera. *Newsday*, July 20, 2020.

[11] H. Fountain, *The New York Times*, May 4, 2022; W. Choi-Schargrin, *The New York Times*, July 23, 2022.

[12] CSHH Comments to the Glen Cove Planning Board, October 17, 2021; https://coalitiontosavehempsteadharbor.org/special-reports/.