

## WATER CONSERVATION FOR THE TOWN OF SOUTHOLD

The Town of Southold is currently consuming water at an unsustainable level if the town wishes to rely on its own freshwater aquifer supplies. This study was executed by Peconic Green Growth, Inc., a not-for-profit organization, with a grant from the Long Island Community Foundation. Simultaneously, the town created a water conservation committee to guide education and recommend actions to the Town Board.

### 1. A fragile freshwater source

- Southold relies mostly on water from underground segments of the Upper Glacial Aquifer that float above saline waters. When considering groundwater elevations and thickness, every foot of elevation above sea level represents approximately 40 feet of depth.<sup>1</sup>
- Because the aquifers act more like flexible bubbles than buckets, excessive pumping impacts the viability of the underground reservoirs, reducing their size, increasing susceptibility to saltwater intrusion, and potentially causing existing contamination to migrate.
- The groundwater is dynamic. It travels ten feet horizontally for every foot it sinks vertically, discharging to the bays and Long Island Sound.<sup>2</sup>
- While recharge from onsite wastewater systems is normally considered, studies indicate that 30-50% is lost to outdoor uses.<sup>3</sup> In Southold, public wells tend to be in the middle of the land mass, while most of the development (61%) hugs the shoreline, where groundwater travels to the bays in less than two years and wastewater may not recharge the aquifers being pumped.<sup>4</sup>

### 2. Salt-water intrusion

Southold's vulnerability to saltwater intrusion is exacerbated by the following conditions:

- Its extensive, developed shoreline coupled with a narrow land mass and multiple peninsulas, which all lengthen and complicate the saltwater interface horizontally.
- Aquifers that are surrounded below as well as horizontally by saline waters.
- A shallow saltwater interface, which requires use of low capacity wells.
- Uneven and extreme pumping patterns caused by seasonal demands and irrigation.

### 3. Peaking

It is not just the total quantity of water pumped that impacts the water supply, but also when it is pumped. Due to both agricultural and tourist economies, demand for water is highest in the summer months when recharge is at its lowest, and evapotranspiration rates are high. In summer months of 2008 Southold had early morning demands that were 4.52 times the daily average water demand. If this difference is not modified, a study by CDM Smith estimated that by 2030, the aquifer would become shallower by 40 feet and wetlands negatively impacted.<sup>5</sup> Volumes of withdrawal are already 24% higher in 2016 than those originally projected for 2030. Extremes in demand increase the cost of delivery, as more wells and storage tanks are needed to meet simultaneous draws and water used for outdoor use is treated to potable standards.

### 4. Water Consumption in the Town of Southold

If one considers both SCWA and onsite wells, a total 2.6 billion gallons is withdrawn from Southold's groundwater annually. Just under half of the parcels in the Town of Southold are serviced by the SCWA. Forty-six percent of SCWA water consumption occurs during the summer and another 31% in the autumn. Residential, average summer use is 559 gallons per day (gpd) for single-family homes. This is 2.4 times the national average. Median summer use is 247 gpd. This means that people who are conservative in their water use are subsidizing the heavy users, as water rates are flat.

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<sup>1</sup> Ghyben-Herzberg principle

<sup>2</sup> Schubert, Christopher, *Hydrogeologic Framework of the North Fork and Surrounding Areas, Long Island, New York*, Water-Resources Investigations report 02-4284, U.S. Geological Survey, P16

<sup>3</sup> DeOreao, William G.; Mayer, Peter; Dziegielewski, Benedykt; Kiefer, Jack, *Residential End Uses of Water, Version 2*, Water Research Foundation, 2016

<sup>4</sup> Berry, Glynis, *Pilot Study of Clustered Decentralized Wastewater Treatment systems in the Peconic Estuary*, Peconic Green Growth, Riverhead, NY 2015

<sup>5</sup> CDM, *Long-Term Potable Supply in Southold, New York: Managing a Limited Freshwater Aquifer in a Largely Agricultural Region*, 2011 presented at the 2011 Ground Water Protection Council Forum, Atlanta Georgia

## 5. How is water used?

Use is complicated by a tourist and second-home economy. Occupancies in summer can increase dramatically due to visitors and the use of residences for seasonal income. The accoutrements of a resort area, such as swimming pools, hot tubs, 16-gallon-a-minute showers, and boat maintenance gobble up more water. Irrigation and other outdoor uses can consume 50% of domestic water use. There is a rough correlation between home value and water use. In Southold, the average gpd ranges from 253 for homes worth less than 332,000 to 2,511 gpd for homes valued over two million dollars.

## 6. Uses other than homes

Among other users, Peconic Landing, a life-care community, and a local nursing home are the highest consumers, followed by resort-type uses, such as motels, marinas, golf course clubhouses, and food service. Funeral homes also consume water at a significant rate. The beverage industry is not documented in the SCWA data, but the growing number of breweries and distilleries will likely tax water resources. Amid this is the need to protect water for food production.

## 7. Conservation Goals

SCWA is tasked by NYS DEC to reduce peak demand by 15% by 2020, when compared to 2012 numbers. A CDM Smith report identifies a need to reduce this by 33% in Southold. The Greenport/East Marion aquifer system should aim for an even higher goal of at least 45%, as the water cannot be fully sourced locally, and 100% of water use in the sewer district is lost, discharging directly to the LI Sound. Future growth needs to be reconsidered, as projected figures for 2030 have already been exceeded. A 1964 report recommends not using more than 30% of rainwater recharge<sup>6</sup>. An even more aggressive conservation goal, accounting for the horizontal movement of the aquifers recharging the bays and Long Island Sound, should be considered to protect wetlands and surface water quality. These goals need to be applied to properties accessing onsite wells, as well as those using public supplies, as the source is shared.

## 8. Actions

### 1. *Education coupled with pilot installations and incentives for water conservation*

Information on how people use water, water-wise landscaping, incentives, and how to conduct a water audit are sample topics. Sessions with landscape, irrigation and farming professionals could help outreach. Best practices can be showcased. Incentive programs should focus on both exterior and interior water conservation improvements.

Suggested budget for incentives:

- \$600,000 for town upgrades/pilots for Town Properties and incentives for people using SCWA (This is the cost of one SCWA well)
- \$600,000 for incentives for people on wells (include a water meter)

### 2. *Tiered pricing for both SCWA customers and people using onsite wells, based on consumption*

All additional funds raised should be dedicated to conservation incentives and demonstration projects. For properties using onsite wells, a temporary fee structure could be linked to building value, to be superseded by meter data.

### 3. *Meter program*

Incentives and possible requirements for the installation of working meters for all onsite wells.

### 4. *Annual reports to Southold/public on water use, saltwater intrusion, and the effectiveness of conservation efforts.*

### 5. *Planning strategies, water budgets and regulations to curb demand and control pumping*

Ultimately a series of planning strategies and regulation may be needed to curb excessive water use. Regulations controlling water consumption for irrigation, swimming pools, geothermal systems, and plumbing fixtures may be necessary and cost effective. Southold needs a zero-sum strategy when addressing water consumption from new development, expansions, or intensifications of use.

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<sup>6</sup> Crandell, H.C., *Geology and Ground-Water Resources of the Town of Southold, Suffolk County, New York*, Department of Interior, 1964, Geological Survey Water-Supply Paper 1619-GG