BASIS FOR DISCHARGE

TO SUBSURFACE SEWAGE DISPOSAL SYSTEM ("SSDS")

HOUSEHOLD SIZE (**Attachment 1**)	2.68[1]
WATER USAGE	
3 Showers at 10 min./shower	45 gallons
30 toilet flushes at 1.6 gal/flush	48 gallons
2 dishwasher runs (energy star)	8 gallons
.5 washing machine cycle/day	7.5 gallons
Dish washing (non-machine), cooking and personal care	25 gallons
DAILY DISCHARGE TO SSDS	**133.5 gallons**
Compared to households served by Norwich Public Utilities (**Attachment 2**)	144.9 gallons[2]
Compared to households served by Groton Utilities (**Attachment 3**)	177 gallons[3]

This calculation supports the use of a 45 gallon per bedroom discharge to a SSDS contained in a report entitled "Avery Brook Homes Septic System Effluent Renovation Analysis 94-100 Stoddards Wharf Road Ledyard, Connecticut February 3, 2023 (the "Study") prepared by Angus McDonald Gary Sharpe & Associates, Inc. The calculation is inherently consistent with data for household use published by Groton Utilities and Norwich Public Utilities. It highlights the fact that the 150 gallon per bedroom design requirement contained in the public health code is no longer a representative standard for projecting actual SSDS discharges to the soil. As indicated in the report, the design standard of 150 gallons/bedroom/day has remained unchanged since the adoption of the code. The code originally had a 50% regulatory margin of safety and current household sizes have decreased nearly 50% since the code was originally published. There have been two fundamental cultural changes that have vastly reduced water consumption since the adoption of the public health code; i.e. a substantial reduction in household occupancy and the development of water conservation fixtures not available at the time that the code was adopted.

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[1] Based on current United States Census for Ledyard. Rounded to 3 for calculation.

[2] The Norwich Public Utility and Groton Utilities metrics are total per person consumption, not discharges to municipal sewers or SSDS. Total consumption includes irrigation, vehicle washing, etc.

[3] The Norwich Public Utility and Groton Utilities metrics are total per person consumption, not discharges to municipal sewers or SSDS. Total consumption includes irrigation, vehicle washing, etc.

The results derived from the study are based on input data as formulated above which data is consistent with current consumption statistics published by two regional public utilities.

ATTACHMENT 1

An official website of the United States government

United States Census Bureau

QuickFacts

Ledyard town, New London County, Connecticut

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more.***

Table

All Topics	Ledyard town, New London County, Connecticut
Population Estimates, July 1 2022, (V2022)	NA
Population Estimates, July 1 2021, (V2021)	15,336
PEOPLE	
Population	
Population Estimates, July 1 2022, (V2022)	NA
Population Estimates, July 1 2021, (V2021)	15,336
Population estimates base, April 1, 2020, (V2022)	NA
Population estimates base, April 1, 2020, (V2021)	15,359
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	NA
Population, percent change - April 1, 2020 (estimates base) to July 1, 2021, (V2021)	-0.1%
Population, Census, April 1, 2020	15,413
Population, Census, April 1, 2010	15,051
Age and Sex	
Persons under 5 years, percent	6.9%
Persons under 18 years, percent	25.8%
Persons 65 years and over, percent	15.6%
Female persons, percent	50.2%
Race and Hispanic Origin	
White alone, percent	84.8%
Black or African American alone, percent (a)	1.7%
American Indian and Alaska Native alone, percent (a)	1.8%
Asian alone, percent (a)	4.2%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.0%
Two or More Races, percent	6.3%
Hispanic or Latino, percent (b)	5.8%
White alone, not Hispanic or Latino, percent	81.7%
Population Characteristics	
Veterans, 2017-2021	1,444
Foreign born persons, percent, 2017-2021	3.6%
Housing	
Housing units, July 1, 2021, (V2021)	X
Owner-occupied housing unit rate, 2017-2021	85.5%
Median value of owner-occupied housing units, 2017-2021	$243,200
Median selected monthly owner costs -with a mortgage, 2017-2021	$1,917
Median selected monthly owner costs -without a mortgage, 2017-2021	$914
Median gross rent, 2017-2021	$1,356
Building permits, 2021	X
Families & Living Arrangements	
Households, 2017-2021	5,696
Persons per household, 2017-2021	2.68
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	90.7%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	5.5%
Computer and Internet Use	
Households with a computer, percent, 2017-2021	95.8%
Households with a broadband Internet subscription, percent, 2017-2021	95.4%
Education	
High school graduate or higher, percent of persons age 25 years+, 2017-2021	97.7%
Bachelor's degree or higher, percent of persons age 25 years+, 2017-2021	38.2%

Health	
With a disability, under age 65 years, percent, 2017-2021	7.4%
Persons without health insurance, under age 65 years, percent	⚠ 3.3%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2017-2021	63.0%
In civilian labor force, female, percent of population age 16 years+, 2017-2021	59.3%
Total accommodation and food services sales, 2017 ($1,000) (c)	919,042
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	22,199
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	NA
Total retail sales, 2017 ($1,000) (c)	114,179
Total retail sales per capita, 2017 (c)	$7,715
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2017-2021	22.9
Income & Poverty	
Median household income (in 2021 dollars), 2017-2021	$95,359
Per capita income in past 12 months (in 2021 dollars), 2017-2021	$42,183
Persons in poverty, percent	⚠ 5.0%

BUSINESSES

Businesses	
Total employer establishments, 2020	X
Total employment, 2020	X
Total annual payroll, 2020 ($1,000)	X
Total employment, percent change, 2019-2020	X
Total nonemployer establishments, 2019	X
All employer firms, Reference year 2017	168
Men-owned employer firms, Reference year 2017	65
Women-owned employer firms, Reference year 2017	S
Minority-owned employer firms, Reference year 2017	S
Nonminority-owned employer firms, Reference year 2017	76
Veteran-owned employer firms, Reference year 2017	S
Nonveteran-owned employer firms, Reference year 2017	73

GEOGRAPHY

Geography	
Population per square mile, 2020	403.4
Population per square mile, 2010	393.8
Land area in square miles, 2020	38.21
Land area in square miles, 2010	38.22
FIPS Code	0901142600

About datasets used in this table

Value Notes

⚠ Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info ⓘ icon to the row in TABLE view to learn about sampling error.

The vintage year (e.g., V2022) refers to the final year of the series (2020 thru 2022). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2017-2021 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2021 5-year ACS Comparison Guidance page.

Fact Notes

- **(a)** Includes persons reporting only one race
- **(c)** Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data
- **(b)** Hispanics may be of any race, so also are included in applicable race categories

Value Flags

- **-** Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper int open ended distribution.
- **F** Fewer than 25 firms
- **D** Suppressed to avoid disclosure of confidential information
- **N** Data for this geographic area cannot be displayed because the number of sample cases is too small.
- **FN** Footnote on this item in place of data
- **X** Not applicable
- **S** Suppressed; does not meet publication standards
- **NA** Not available
- **Z** Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and P Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

ATTACHMENT 2

Gmail

Harry Heller <hheller@hellermccoy.com>

Fw: more info (from Norwich WSP)

1 message

Peter Gardner <dieter.gardner@yahoo.com> Mon, Feb 27, 2023 at 1:30 PM
To: Harry Heller <hheller@hellermccoy.com>

Norwich water use. Pete

----- Forwarded Message -----
From: Alisa Morrison <alisamorrison@npumail.com>
To: dieter.gardner@yahoo.com <dieter.gardner@yahoo.com>
Sent: Wednesday, February 22, 2023 at 03:00:45 PM EST
Subject: more info (from Norwich WSP)

Table 7-5

It is estimated that NPU serves approximately 35,233 people within Norwich and 1,502 people in its outlying towns for a total estimated service population of 36,735. Based on the consumption information in Table 6-5, the 5-year average residential consumption was 1.78 mgd which yields a per capita water use estimate of approximately 48.3 gpcd. This is lower than the DPH design standard of 75 gpcd, but sensible since many of the residential uses in Norwich are multi-family units with reduced, or no, exterior watering needs. The 1,502 served residents outside of Norwich used approximately 0.09 mgd over the last five years, for a per capita usage estimate of approximately 59.9 gpcd, in comparison to the 35,233 people in Norwich using 48.0 gpcd. This makes sense as the outlying towns have larger lot residential developments which typically have greater landscaping needs.

Projected Residential Water Demands in Norwich Based on Population Projections

Planning Period	Service Population	Service Population Growth	Per-Capita Water Demand (gpcd)	Water Demand (mgd)
Current	35,233	--	48.0	1.69
2027	36,349	+1,116	47.0	1.71
2040	38,632	+2,283	46.0	1.78
2070	43,900	+5,268	45.0	1.98

Table 7-7

Projected Residential Water Demands

Planning Period	Norwich Water Demand (mgd)	Other Towns Service Population	Per-Capita Water Demand (gpcd)	Other Towns Residential Water Demand (mgd)	Total Residential Water Demand (mgd)
Current	1.69	1,502	59.9	0.09	1.78
2027	1.75	1,510	59.0	0.09	1.84
2040	1.82	2,730	57.0	0.16	1.98
2070	1.98	3,000	55.0	0.17	2.14

The promulgation of the 2011 Streamflow Standards and Regulations requires that releases be made from water supply reservoirs. A study conducted by Milone & MacBroom, Inc. in 2016 found that although Stony Brook Reservoir was able to be exempted from the release requirements (as approved by DEEP), releases must be made from Deep River Reservoir during certain periods of the year to be consistent with the Class III release requirements in the regulations. As a result, the safe yield of Deep River Reservoir was reanalyzed as part of this *Water Supply Plan* update. The updated safe yield for Deep River Reservoir (as presented in Appendix G) in consideration of the **release requirements is 4.45 mgd**, 11.8% less than the previously established safe yield of 5.04 mgd.

Permit Duration – From DEEP website

Permits generally require that an authorized diversion be constructed and initiated within three years after issuance of the permit. The expiration date of the permit, which generally does not exceed five years, is established by DEEP based on its consideration of existing uses and allocations of the water resources within the watershed and pertinent facts and circumstances particular to the proposed project. The maximum duration of a water diversion permit by law is twenty-five years. An application to renew a diversion permit must be submitted at least 120 days prior to the expiration date of the permit.

Alisa Morrison, P.E.
Associate Utility Engineer
Norwich Public Utilities
16 S Golden St, Norwich, CT 06360
Mobile 860-235-5614 • Phone 860-823-4527
AlisaMorrison@npumail.com

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566K

ATTACHMENT 3

interim periods between comprehensive surveys, follows up and investigates all reported or suspected leakage.

The master meters at the Water Treatment Plant were last tested in 2003, and found to be within an accuracy range of 3 percent.

Per-Capita Water Use

In the 2006 Water Supply Plan, residential per-capita water use for the Town and City of Groton was approximated to be 52 gpcd. This was based on residential billing plus the sales through master meters to Groton Long Point and Noank. For projecting water production, the consultant then used a value of 60 gpcd for Groton residents.

Based on our latest calculations using paired water use and census figures for 2010, we have arrived at approximately 59 gpcd, in close agreement with the prior plans projected per capita figure. This number was derived in a fashion similar to the last plan, namely taking total water production and then subtracting industrial usage, non-revenue water, sales to Ledyard and sales to the regional customers (not in place for the last plan).

$[5.72 - (2.19 + 0.35 + 0.20 + 0.62)] = 2.36$ mgd

$2{,}360{,}000 \div 40{,}115 = 59$ gpcd[3]

Projected Water Use

At this point, we differ substantially from prior projections of future water use, based on actual usage during the period 2004 – 2012, differing population projections and a significant drop in industrial water use. While residential usage has remained at essentially the same level, commercial use has experienced a small drop and industrial

[3] The water usage figures were based on the 2010 numbers and then coupled with the actual 2010 Federal Census figures for the Town and City of Groton.