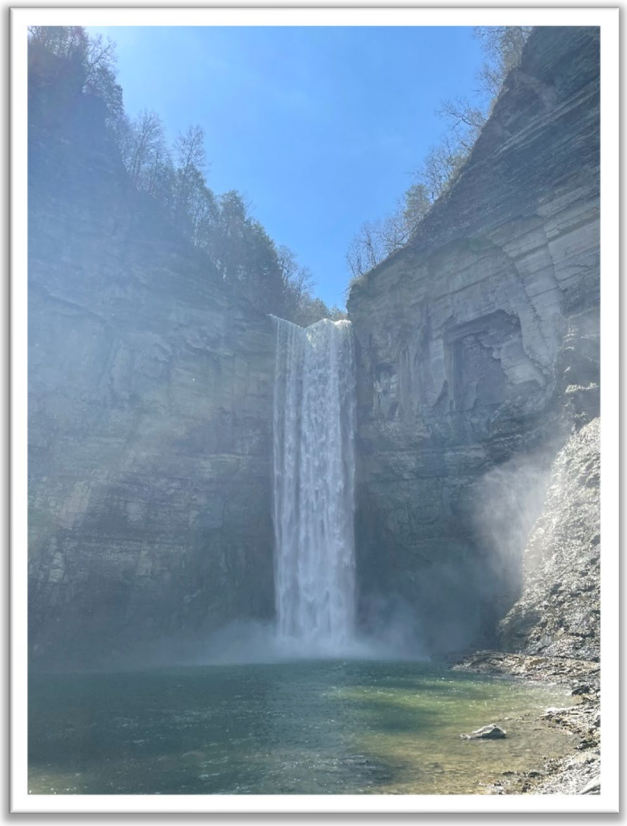
Ulysses Drinking Water Survey Results



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Acknowledgements

A special thank you to Town of Ulysses Water Source Protection Plan Committee, without whom this project would not be possible: Chair Linda Liddle, Vice Chair Roxanne Marino, members Liz Thomas, Tim Martinson, Amy Panek, Rebecca Schneider, Stephen Morreale, Mary Teresa Julien of New York Rural Water, and Town Board liaison Michael Boggs. RCAP Solutions GIS Specialists Adam Borque and Paula Ulloa Hidalgo also contributed to this project.

Executive Summary

The water survey notification was sent to 1,334 property owners in October 2023; 348 surveys were completed for a response rate of 26%. Responses were well distributed geographically across the Town (Figure 1). Despite good distribution, the results herein are not reflective of all Town residents, specifically the 74% of property owners who did not respond. Most homes rely on well water for drinking and/or household water needs. Most water is used for domestic purposes.

Survey results indicated that 13 % of the respondents (46 property owners) do not always have enough water, highlighting water availability as an area of concern. More than 60% of respondents reported at least one water quality problem and 51% reported three or more problems. Similar numbers of respondents (60%) report using water treatment in the home, with about a third spending $500 or more annually on water system maintenance. A majority of respondents (60%, 188 property owners) said they are somewhat or very interested in changing to a municipal water source, though fewer (47%,145 property owners) indicated a willingness to pay more than $500 annually for municipal service. Nearly half of respondents have concerns about impacts to their water supply from manure and fertilizer use (47%, 149 property owners), or weather extremes like drought and flood (46%, 145 property owners).

Background

The Town of Ulysses is in Tompkins County, New York, along the western shore of Cayuga Lake. The Town, outside of the village of Trumansburg, has approximately 1,400 households, of which about 300 are served by public drinking water. The remaining households rely on drinking water from individual sources including private wells, springs, and Cayuga Lake itself. The Town has an interest in prioritizing the protection of water resources. The Town's Water Source Protection Plan Committee (WSPPC) is currently in the process of drafting a Drinking Water Source Protection Plan (DWSP2). As part of the DWSP2 process, and to inform other Town plans related to land use and municipal infrastructure, a survey of residents was conducted by the WSPPC with technical assistance from RCAP Solutions. The survey topics include water source, quantity, quality, treatment, expense, and concerns. The results of the survey are presented here.

The information presented in this report is not intended to be and is not representative of the entire Town or all residents. Additional geospatial analysis can be conducted using location points and data collected in this survey to identify trends, areas of concern, priority for public infrastructure, and more.

Methods

The WSPPC developed the survey questions in part based on a previous 2009 Townwide survey of residents' drinking water quality. Additional questions related to household information, existing conditions and concerns were included, for a total of 28 questions. The only required questions on the survey were the street address of the respondent and the source of drinking water. All other questions were optional. The survey form was hosted in the online platform Survey123 (Appendix A). Paper surveys were held at the Town Hall and made available to residents upon request (Appendix B). To notify residents of the survey, a postcard mailing with information about the survey, providing a QR code and website URL was prepared by the WSPPC and mailed to owners of 1334 residential properties in Ulysses, outside of the Village of Trumansburg (Appendix C). The Town and WSPPC used electronic outreach lists to spread the word about the survey among residents beginning on October 31, 2023. After nearly 12 weeks the survey was closed on January 21, 2024. Surveys containing an invalid address or address outside of the survey boundaries were removed from the analysis. Results were analyzed by RCAP Solutions using ArcGIS Online and Microsoft Excel.

Results

Section 1. Household Information

1. **What is your Street address?**

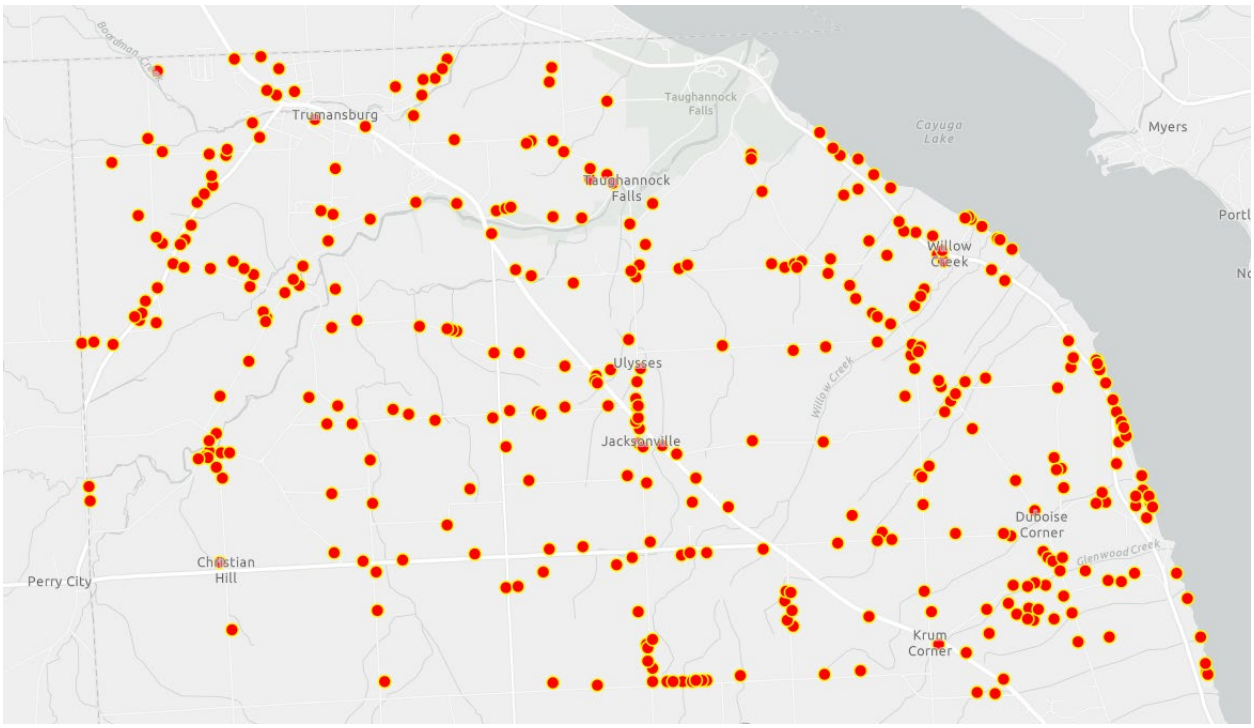


Figure 1. Survey respondents by location

A total of 348 responses were received from individual households within the Town of Ulysses and outside of the Village of Trumansburg. Responses were included if a valid street address and at least one question was answered.

1. Do you own or rent?

Own	99.7% (343)
Rent	0.3% (1)
(N=344; No response = 4)	

3. Is the property occupied year round?

Response	**Percentage of Responses (#)**
Seasonally (5 months or less)	5% (17)
Year-round (6 months or more)	95% (331)
(N = 348)	

2a. How many people in your household are over 18?

Response	Percentage of Responses (#)
1 person	19% (66)
2 people	67% (230)
3 people	10% (34)
4 people	4% (13)
5 people	<1% (2)
(N = 345; No response = 3	

The survey respondents represent households containing 690 individuals over 18.

Responding households range in size from 1-8, an **average of 2.3 people**.

2b. How many people in your household are under 18?

Response	Percentage of Responses (#)
0 persons	81% (267)
1 person	8% (27)
2 people	9% (30)
3 people	<1% (1)
4 people	1% (3)
5 people	<1% (2)
(N = 330; No response = 18)	

The survey respondents represent households containing 112 individuals under 18.

More than 80% of responding households do not have any people under age 18.

Section 2. Water Source Information

4. What the source of Drinking Water?

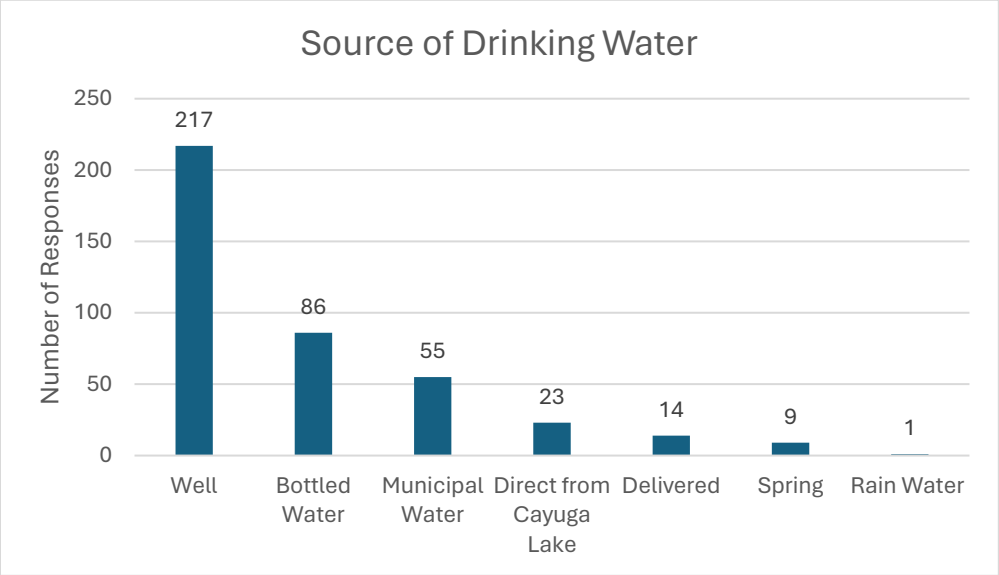


Figure 2. Sources of drinking water

Response	Percentage of Responses (#)
Well	62% (217)
Spring	3% (9)
Rain Water	0% (1)
Direct from Cayuga Lake	7% (23)
Delivered	4% (14)
Municipal Water	16% (55)
Bottled Water	25% (86)
(N = 348)	

Note: More than one response could be selected for this question

While 86% of respondents rely on a single source of water for drinking, four (4) respondents indicated using three sources of water for drinking; Fifty (50) respondents indicated using two sources of water for drinking; nearly half of these (24) use well water and bottled water for drinking water.

Just over half of respondents (N = 182) use **well water only** for drinking water.

5. What is the source of your Household water?

Response	Percentage of Responses (#)
Well	71% (260)
Spring	2% (7)
Municipal Water	15% (55)
Direct from Cayuga Lake	8% (30)
Rainwater	1% (2)
Delivered	1% (3)
Two or more sources	2% (9)
(N = 348)	

Note: More than one response could be selected for this question

A greater number of survey respondents use well water for household water than for drinking water. A few respondents reported delivered water for household use; none reported using bottled water for household water.

24. Your normal water usage includes:

Response	Percentage of Responses (#)
Household Use	99% (346)
Drinking	81% (283)
Water garden and/or lawn	69% (240)
Other outdoor use	20% (71)
Pool/hot tub/spa	7% (25)
Agricultural use	3% (11)
Commercial use	1% (4)
Washing vehicles	1% (3)
Other	2% (7)
(N=347; No response =1)	

Note: More than one response could be selected for this question

Section 3. About the well

6. How many of the following wells do you have:

Response	Drilled Wells	Dug Wells
0	13% (44)	14% (48)
1	68% (237)	54% (187)
2	7% (23)	6% (21)
3	1% (4)	1% (2)
5+	1% (3)	1% (2)
No response	11% (37)	25% (88)

New York State **first began** requiring well drilling completion reports in **April 2000.**

7a. What is the depth of the well casing?

Response	Percentage of Responses (#)
0-19 feet	6% (17)
20-49 feet	9% (26)
50-99 feet	8% (23)
More than 99 feet	5% (13)
Unknown	73% (208)
(N=286; No response = 62)	

7b. What is the depth of your well?

Response	Percentage of Responses (#)
10 feet or less	3% (10)
11-49 feet	10% (28)
50-99 feet	15% (43)
100-199 feet	16% (47)
More than 200 feet	9% (27)
Unknown	47% (136)
(N=289; No response = 59)	

7c. What is the depth to water in your well?

Response	Percentage of Responses (#)
0-9 feet	6% (19)
10-19 feet	3% (8)
20-49 feet	5% (14)
50-99 feet	3% (9)
More than 100 feet	2% (7)
Unknown	80% (230)
(N=286; No response = 62)	

7d. What year was the well construction?

Response	Percentage of Responses (#)
1900 or earlier	1% (4)
1901-1949	2% (6)
1950-1969	7% (19)
1970-1989	16% (47)
1990-1999	13% (36)
After 2000	18% (52)
Unknown	44% (126)
(N=287; No response = 61)	

8. How far is your well from the nearest septic system?

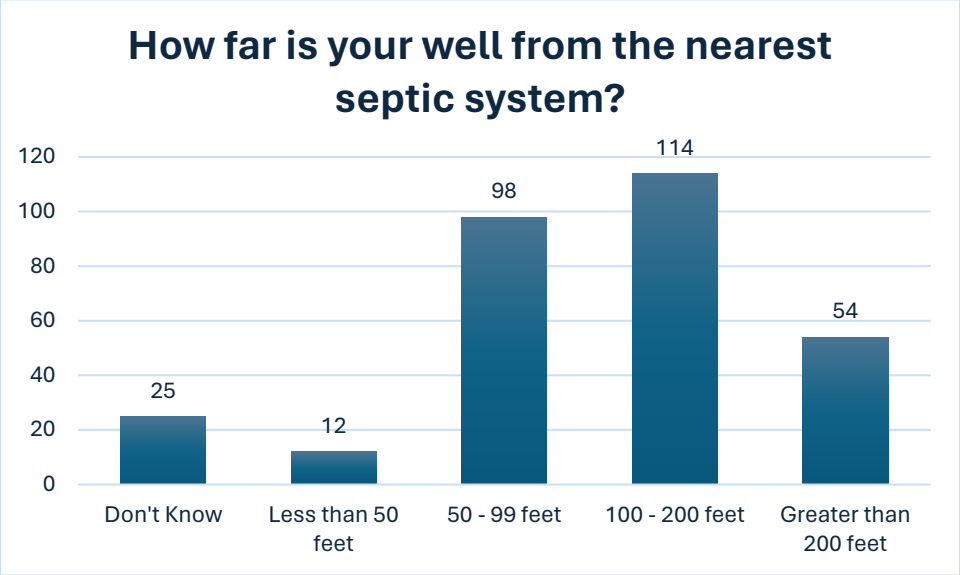


Figure 3. Distance between well and septic system

Response	Percentage of Responses (#)
Don't Know	8% (25)
Less than 50 feet	4% (12)
50 - 99 feet	32% (98)
100 - 200 feet	38% (114)
Greater than 200 feet	18% (54)
(N =303; No response = 45)	

The required separation distance under current New York State Public Health Law section 75-A[1], which applies to residential onsite wastewater treatment systems, a minimum separation distance of 50 feet is required between a concrete septic tank and a private well; and 100 feet between any absorption area (tile field, sand filter, seepage pit, etc.) and a private well; this distance is doubled when the septic system is upstream of and in the direct drainage path of a private well.

[1] New York State Title 10 Chapter II Part 75. Standards for Individual Water Supply and Individual Sewage Systems. 3 February 2010. https://www.health.ny.gov/environmental/water/drinking/docs/appendix_75a.pdf

Section 4. Drinking Water Quantity

9. Do you always have enough drinking water?

Response	Percentage of Responses (#)
Yes	87% (297)
No	13% (46)
(N=343; No response = 5)	

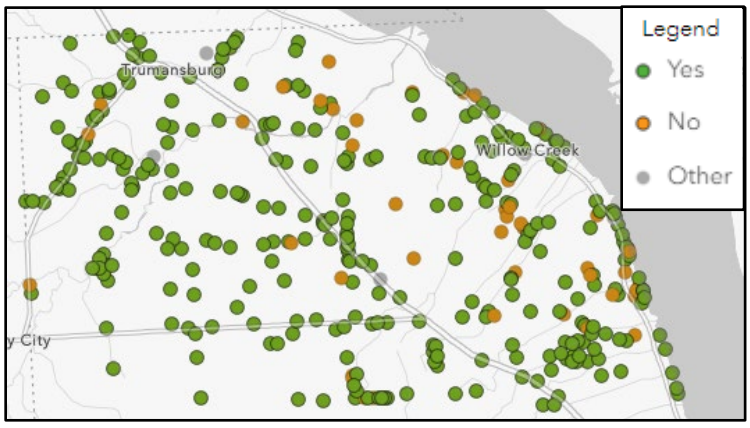


Figure 4. Responses showing constant availability of drinking water

10. If not, when does the source run dry?

Response	Percentage of Responses (#)
Every summer	10% (4)
Often during the summer	13% (5)
Some years	46% (18)
Throughout the year	31% (12)
(N=39; No response = 309)	

Nearly one in seven respondents report **not always having enough** drinking water.

11. Has the quantity of your water changed?

Response	Percentage of Responses (#)
Increased	1% (4)
Decreased	9% (32)
Has remained the same	76% (261)
Don't know	13% (45)
(N=342; No response = 6)	

12. If the quantity has changed, how many years ago?

Response	Percentage of Responses (#)
0-1 years ago	12% (4)
2-4 years ago	27% (9)
5-9 years ago	27% (9)
10-15 years ago	27% (9)
16+ years ago	6% (2)
(N=33; No response = 315)	

Section 5. Drinking Water Quality

13. Does your untreated water have any of the following problems?

Response	Percentage of Responses	Number of Responses
Hardness	61%	201
Iron	48%	160
Sulfur	47%	156
Odor	33%	110
Bad taste	28%	93
Sediment	27%	90
Discoloration	19%	64
Bacteria	16%	52
Other	10%	32
N/A No problems	9%	31
Salt (chloride)	7%	23
Methane	4%	12
Nitrates	3%	10
Zebra mussels	3%	9
Radon	2%	7
(N = 332; No response = 16) **Note: More than one response could be selected for this question.**		

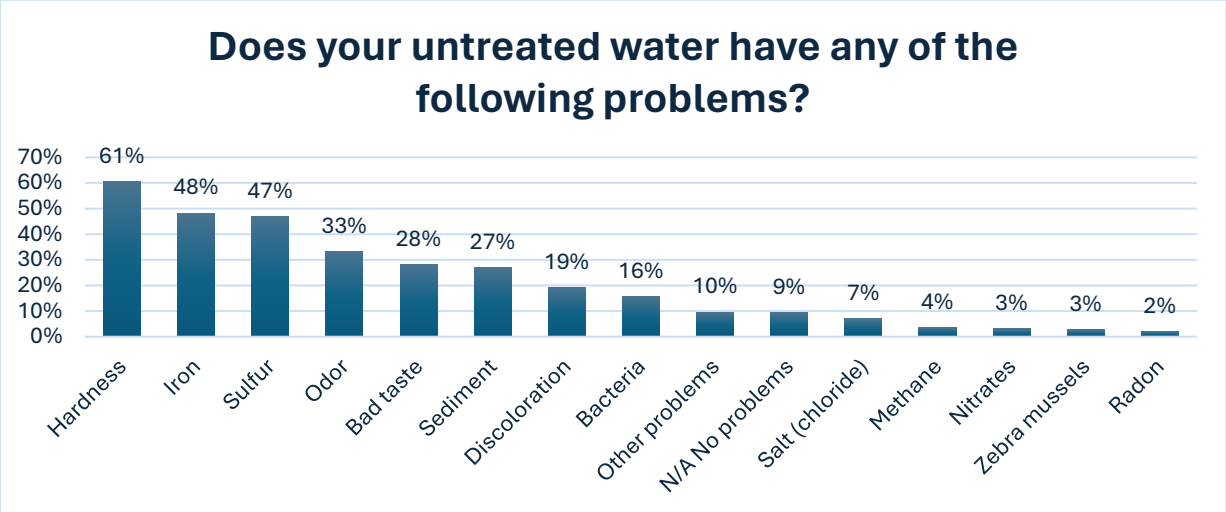


Figure 5. Untreated water problems

51% of respondents reported **three or more** problems with untreated water.

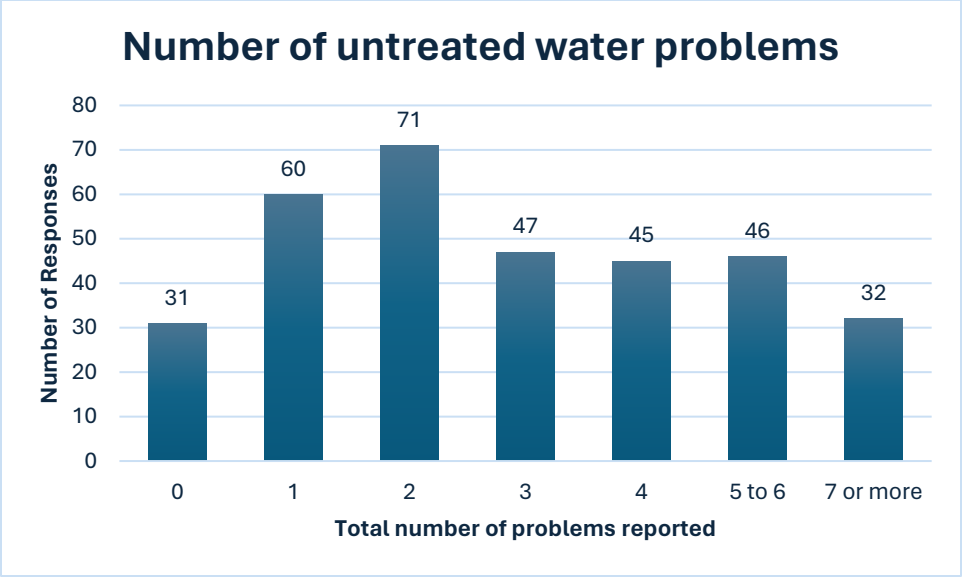


Figure 6. Number of untreated water problems reported

14. If you have seasonal problems with water quality in which season do they occur?

Response	Percentage of Responses (#)
N/A No seasonal problems	73% (230)
Summer	13% (42)
All Seasons	6% (18)
Spring	2% (7)
Summer and Fall	2% (5)
Spring and Summer	2% (5)
Other	3% (8)
(N=315; No response = 33)	

15. How would you rate the Quality of your untreated water?

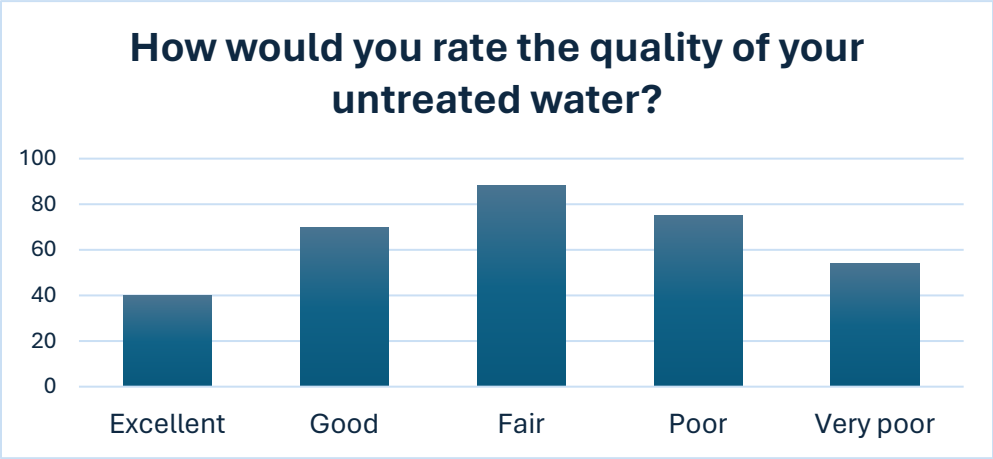


Figure 7. Overall water quality rating

Response	Percentage of Responses (#)
Excellent	12% (40)
Good	21% (70)
Fair	27% (88)
Poor	23% (75)
Very poor	17% (54)
(N=327; No response = 21)	

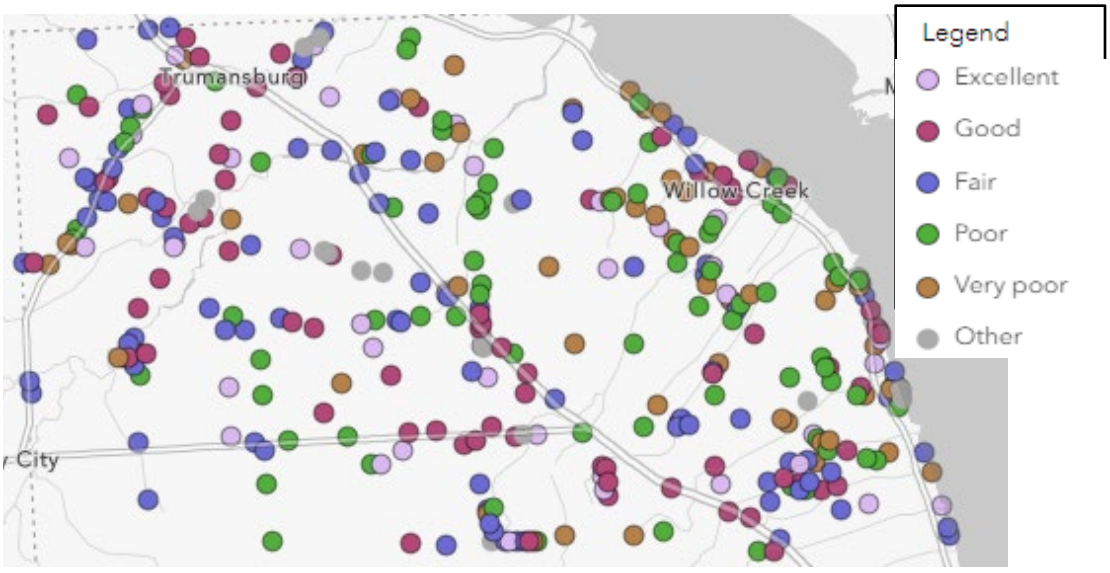


Figure 8. Responses showing overall water quality rating

16.Has the quality of your water changed?

Response	Percentage of Responses (#)
Remained the same	72% (243)
Don't know	14% (47)
Worsened	11% (36)
Improved	3% (11)
(N=337; No response =11)	

17. If the quality has changed approximately how many years ago?

Response	Percentage of Responses (#)
0-1 years ago	16% (7)
2-4 years ago	23% (10)
5-9 years ago	26% (11)
10-15 years ago	26% (11)
16+ years ago	9% (4)
(N=43; No response = 305)	

Section 6. Water Treatment and Expense

18. Have you ever had your water tested?

Response	Percentage of Responses (#)
Yes	73% (251)
No	27% (92)
(N=343; No response =5)	

NYSDOH recommends **annual testing** for total coliform/E.coli bacteria in private wells.

19. Do you treat your drinking water?

Response	Percentage of Responses (#)
Yes	60% (207)
No	40% (136)
(N=343; No response =5)	

20. Do you treat your household water?

Response	Percentage of Responses (#)
Yes	69% (235)
No	31% (108)
(N=343; No response =5)	

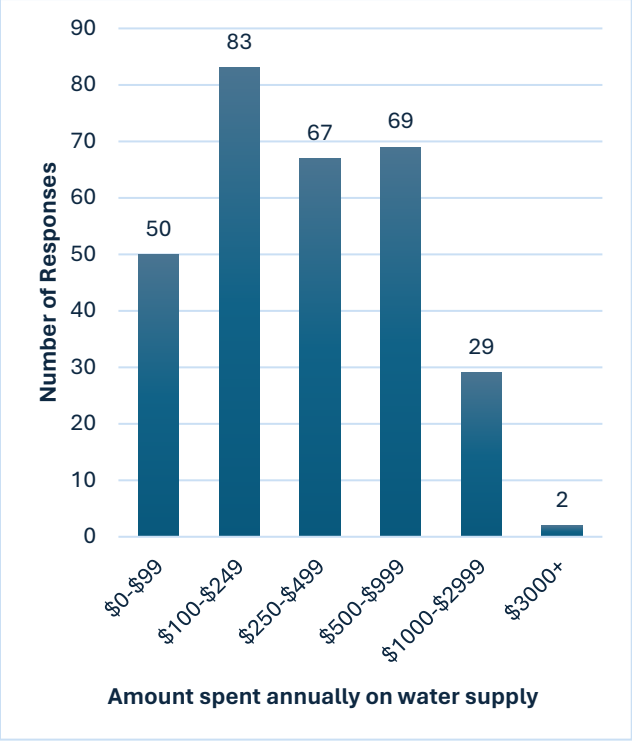
More respondents treat household water (69%) than treat drinking water (60%)

21. Does your water treatment system include any of the following treatments for your primary drinking water source?

Response	Percentage of Responses (#)
Water Softener	49% (166)
Carbon filter	32% (109)
Sediment Filter	29% (97)
UV disinfection	21% (72)
Chlorine	17% (59)
No Treatment System	17% (59)
Reverse Osmosis	12% (42)
Other	12% (42)
Not sure	4% (15)
Zebra mussel protection	4% (12)
(N =338; No response =10)	

1 in 3 responses report spending $500 or more each year on their water supply

22. What is the approximate annual cost of maintaining your water supply (treatment, maintenance, water delivery)?



Response	Percentage of Responses (#)
$0-$99	17% (50)
$100-$249	28% (83)
$250-$499	22% (67)
$500-$999	23% (69)
$1000-$2999	10% (29)
$3000+	1% (2)
(N=300; No response =48)	

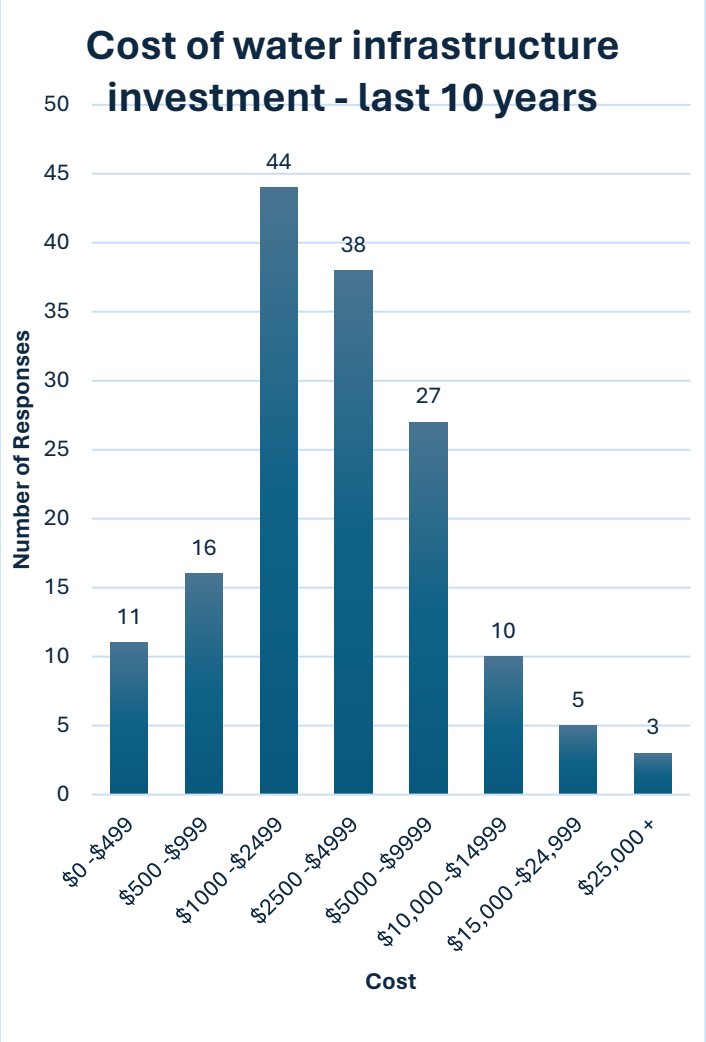
Mean	$404
Median	$300
Min	$0
Max	$3,600

Figure 9. Annual cost of water supply

23. Have you made any major investments in your water infrastructure in the past 10 years?

Response	Percentage of Responses (#)
Yes	48% (161)
No	52% (176)
(N=337; No response = 11)	

23b. If yes, what was the approximate cost?



Response	Percentage of Responses (#)
$0 -$499	7% (11)
$500 -$999	10% (16)
$1000 -$2499	29% (44)
$2500 -$4999	25% (38)
$5000 -$9999	18% (27)
$10,000 -$14999	6% (10)
$15,000 -$24,999	3% (5)
$25,000 +	2% (3)
(N=154; No response = 194)	

Mean Cost	$4,445
Median Cost	$2,500
Minimum Cost	$200
Maximum Cost	$50,000

Figure 10. Cost of major investment in water supply

Section 7. Additional Information

25. How interested are you in changing your water source to a municipal water system, if available?

Response	Percentage of Responses (#)
Uninterested	23% (72)
Neutral	17% (53)
Somewhat interested	21% (65)
Very interested	39% (123)
(N=313; No response = 35)	

60% of respondents are somewhat or very interested in changing to a **municipal water system**

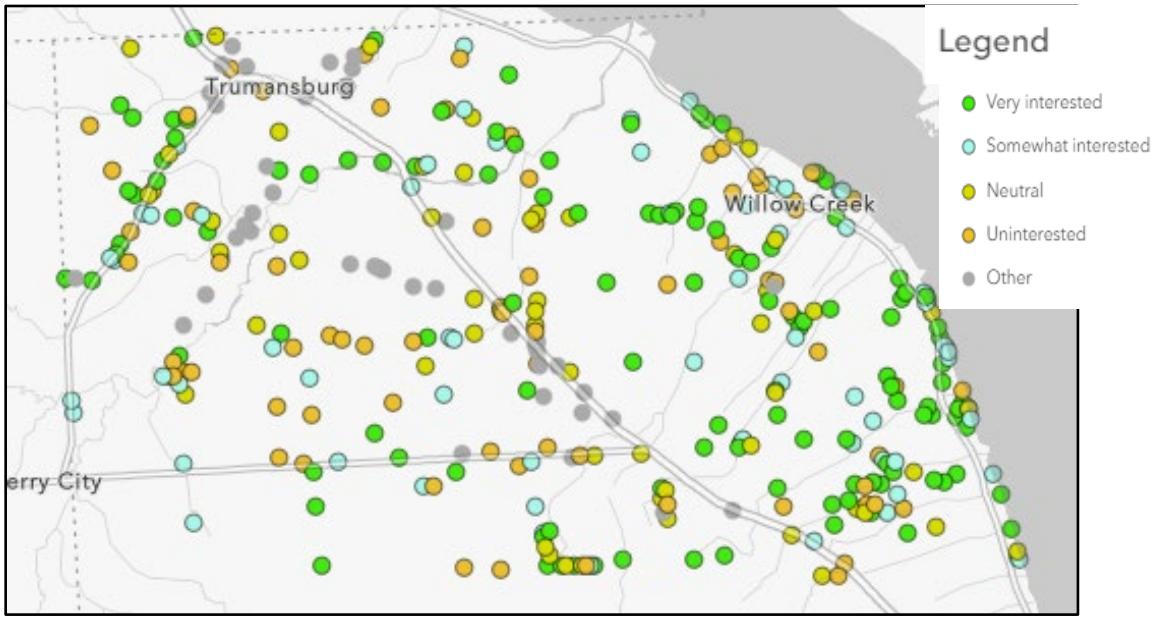


Figure 11. Responses showing interest level in municipal water source

26. How much would you be willing to pay for municipal water service per year?

Response	Percentage of Responses (#)
Less than $500	34% (105)
$500 - $1,000	33% (101)
$1,000 - $1,500	6% (19)
More than $1,500	8% (25)
Unable to pay	3% (9)
Unwilling to pay	15% (47)
(N=306; No response =42)	

27. Please indicate if you are concerned with any of the following issues affecting your water supply:

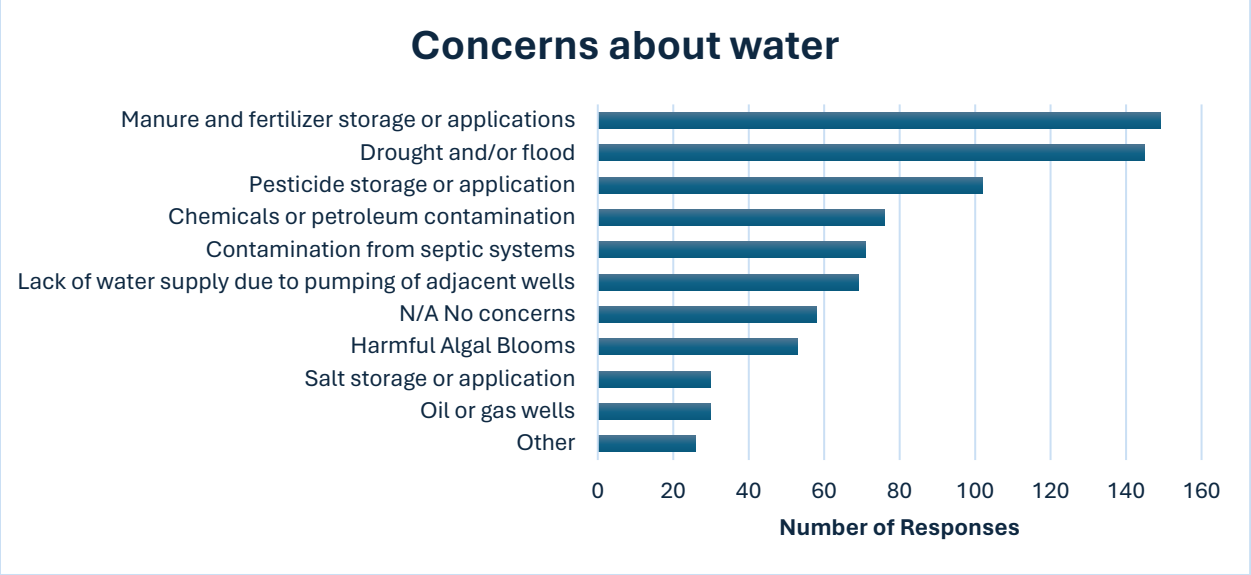


Figure 9. Concerns about issues affecting water supply

Response	Percentage of Responses (#)
Manure and fertilizer storage or applications	47% (149)
Drought and/or flood	46% (145)
Pesticide storage or application	32% (102)
Chemicals or petroleum contamination	24% (76)
Contamination from septic systems	23% (71)
Lack of water supply due to pumping of adjacent wells	22% (69)
N/A No concerns	18% (58)
Harmful Algal Blooms	17% (53)
Oil or gas wells	10% (30)
Salt storage or application	10% (30)
Other	8% (26)
(N=314; No response =34)	

Note: More than one response could be selected for this question

28. Any additional information that you'd like to share?

This open-ended question yielded responses from 123 survey respondents who shared additional detail on water topics in the survey. Tim Martinson, WSPPC member, reviewed these responses and is summarized here:

Fifty-three (53) responses mentioned municipal water, either currently having a connection, having interest, or being uninterested. The existing or potential cost of municipal water service was reported as a source of concern.

Level of satisfaction with one's water supply was mentioned, with 27 responses expressing satisfaction with water quality and quantity, and 15 responses detailing problems with water quality or quantity.

"Farming fields close to my home spread liquid manure a few times a year and I am concerned about how it is impacting my well."

"We have been here for over 40 years and have never had any problems."

Respondents also commented on the challenges of at home water treatment, especially those that rely on beach wells. Specific concerns about contamination from manure spreading were mentioned by 10 respondents.

"We were only able to use our well for 1 year. Now we must have all of our water delivered."

"Water treatment is a constant battle -- getting the chemicals right, cleaning cycles, maintaining equipment. Every couple of months we need a technician."

"We are concerned about long-term sustainability of our water supply as we have run low or out of water in our well occasionally and experience some sediment in the water. We would be interested in learning more about options to expand Municipal water system to our area."

Discussion

It is noted that while the response rate of 26% provides a useful and informative set of data, the results of this survey should not be interpreted as entirely representative of the Town. Survey responses show that most residents use a private well for drinking or household water and most of these wells provide an adequate supply of water. However, an area of concern is that 13% of responses report not having enough drinking water during at least part of the year.

When it comes to water quality, 39% of respondents rated their untreated water quality as Very poor or Poor, and another 27% as Fair. More than half of respondents reported three or more problems with their untreated water. Consequently, a majority of respondents are treating household and/or drinking water, with water softeners and carbon or sediment filters as the most common form of treatment.

The cost of maintaining one's water supply varies widely, with a median cost reported as $300 per year. Nearly half (48%) of respondents reported a major investment in the water system in the last decade and these costs averaged around $4,400 with three reports of spending more than $25,000. Interest in municipal water availability is strong and can be analyzed geospatially for viability of possible public water extensions, though concerns about potential cost and willingness to pay should be further evaluated. Concerns exist among nearly half of respondents about impacts to water from agricultural activities, specifically manure spreading and applications of pesticides and fertilizers. Similar levels of concern are reported for climate related events like drought or flood. Many unknowns remain for residents with private wells, from construction type, year constructed, depth, or distance to septic systems.

Additional resources for best practices of managing private water and wastewater supplies are in the following section and Appendices.

Additional Resources

Private Well Class Online: https://privatewellclass.org/

National Onsite Wastewater Recycling Association, Onsite Wastewater Treatment System User Guide: https://www.nowra.org/library/homeowner-training-materials/users-guide/

Local Water Quality Resources

Community Science Institute (Certified Testing Lab): http://www.communityscience.org/

Cayuga Lake Watershed Intermunicipal Organization: https://cwio.org/

Tompkins County Stormwater Coalition: https://tcstormwater.org/

Cayuga Lake Watershed Network: https://www.cayugalake.org/

Appendices

A. Online Survey Instrument
B. Paper Survey Instrument
C. Survey Notification Postcard
D. NYSDOH Individual Water Supply Wells Fact Sheet #7 Testing, Operation, and Maintenance of Residential Wells
E. NYSDOH Individual Water Supply Wells Fact Sheet #5 Susceptible Water Sources