



Potable Drinking Water Comparison of Alternatives

Town of Shelter Island Water Advisory Committee
Public Information Session
October 9, 2024



Process Check

Agreed Process

Status

Solicit Input



Public, informational Meetings. Professional consultation

Define Problem



Potable water concerns due to elevated nitrates and other contaminants

Success/Outcome



Sustainable, cost effective availability of potable water as defined by NY State



Agreed Process

Seek high quality, relevant data



Status

Ongoing nitrate and other contaminant testing in town center. Full panel testing recommended for Center, Silver Beach, Menantic Peninsula. Repeat USGS baseline study in 2026-2029

Identify & Evaluate Options



See following slides

Recommended Solutions



TBD



Summary:

Depending on quality of untreated well water, 25 yr NPV costs of private well options and community water options are similar

In 2/5 scenarios, cost is within margin of error of analysis: 3/5 scenarios CWS is ~> expensive

Private Well Options

Homeowner is responsible for service reliability and present & future water quality including:

- Annual water testing and mitigation for results
- Recommended filter replacement schedule
- System maintenance contract
- Maintain/purchase well equipment
- Drinking from (1) POU faucet only, or face health risks

Does not leave space for natural aquifer decontamination options.

Community Water Service Option

Manager is responsible for service reliability and future water quality based on federal, state and county compliance.

Cost and system decision-making authority manager's responsibility

Leaves space for natural aquifer decontamination options.



Assumed Ground Truth

4 BR, 2.5 BTHR, 4 FULL-TIME RESIDENTS

Private Well Treatment Options

Existing Well & Septic

Sufficient hydraulic capacity to meet household needs -

20 yr. remaining well service life

Traditional septic - no IA requiring separate drainage

Community Water Service Option

House is not more than 150' from street



Test Results

Well #1

pH - 6.0

Nitrates - 6.0 mg/L

Manganese - 1.0 mg/L

Well #2

pH - 6.5

Chlorides - 200 mg/L

Meaning

Well #1 is potable, but

Slightly acidic, > risk of pipe and appliance corrosion

Nitrates < MCL but in grey zone**

Manganese > water hardness

Well #2

Same as Well #1

Salt taste

** Academic studies show some *correlation* between nitrates at 5-10 mg/L and some forms of cancer.



Test Results

Well #3

pH - 6.0

Nitrates - 14.0 mg/L

PFOS/PFOA - 33 ppt

1, 4 Dioxane - 1 ppb

Meaning

Well #3 is non-potable

pH - Acidic, > risk of pipe and appliance corrosion

Nitrates - above MCL (10 mg/L)

PFOS/PFOA - above MCL at 10 ppt, (4 ppt by 2027)

1, 4 Dioxane - not regulated, but emerging contaminant and MCL expected.



Supplier Recommendations for Private Well Treatment

WAC member presented 3 test results and household characteristics to well water treatment suppliers. They provided recommendations and rough estimates of capital and ongoing annual costs shown on following slides.

Cost estimates include a contingency for unforeseen conditions

All suppliers would require a full-panel water test before recommending a treatment system



Recommended Treatment System(s) Private Well #1 Option

System

- pH Adjustment filter
- Water softener for Mn and increased hardness due to pH Adjustment
- Reverse Osmosis (RO) system at kitchen sink (customer option)

Estimated Capital & Maintenance

- Capital (Note 1)
 - \$5,320
 - \$1,620 for RO
- Annual Cost (Note 1)
 - ~\$795 + \$200 for RO
- Estimated 20 yr cost (NPV @ 3%) (Notes 1, 2)
 - Excluding RO ~ \$18,615
 - Including RO ~ \$23,211

Treatment System Well #1





Well #1 Treatment System Evaluation

Effective

- Potable drinking water
- Controlled pH and hardness
- Nitrates eliminated with RO

Implementation

- Low Risks
- Vendors use proven technology and provide maintenance over time

Cost

- Est. NPV over 20 yr = \$18,615 or \$23,211 with RO

Risks

- Root cause of contamination unknown
- Risk of future contaminants unknown and homeowner bears treatment cost
- RO impact low due to 1:1 discharge volume but neighborhood impact unknown
- Homeowner responsibility for annual testing and maintenance



Recommended Treatment System(s) – Private Well Option

Well # & System

- Well #2
 - pH Adjustment filter
 - Reverse Osmosis at kitchen sink to reduce chlorides in drinking water

Estimated Capital & Maintenance Cost

- Capital Cost (Note 1) **\$4,620**
- Annual Cost (Note 1) **\$755**
- Estimated 20 year cost (NPV @ 3%) (Notes 1 & 2)
 - ~\$17,340



Well #2 Treatment System Evaluation

Effective

- Potable drinking water
- Controlled pH
- Chlorides eliminated with RO

Implementation

- Low Risks
- Vendors use proven technology and provide maintenance over time

Cost

- Est. NPV over 20 yr = \$17,340

Risks

- Root cause of contamination unknown
- Risk of future contaminants unknown and homeowner bears treatment cost
- RO impact low due to 1:1 discharge volume but long-term impact on neighboring wells unknown
- Homeowner responsibility for annual testing and maintenance



Recommended Treatment System(s) Private Well #3 Option

System

- pH Adjustment filter
- Whole house Granulated Activated Carbon (GAC) filter
- Reverse Osmosis (RO) system at kitchen sink

Estimated Capital & Maintenance

- Capital (Note 1)
 - \$7,380
- Annual Cost (Note 1)
 - \$1,055
- Estimated 20 yr cost (NPV @ 3%) (Notes 1, 2)
 - ~\$24,563



Well #3 Treatment System Evaluation

Effective

- Potable drinking water
- Controlled pH
- GAC eliminates most contaminants in whole house
- RO further eliminates contaminants at kitchen sink

Implementation

- Low Risks
- Vendors use proven technology and provide maintenance over time

Cost

- Est. NPV over 20 yr = \$24,563

Risks

- Root cause of contamination unknown/not addressed
- Risk of future contaminants unknown and homeowner bears treatment cost
- RO impact low due to 1:1 discharge volume, but neighborhood impact unknown
- Homeowner responsibility for annual testing and maintenance



Community Water System (CWS)

Straw Man NOT a proposal

- System designed to provide potable water (NYS standards) to Town Center
- What would a CWS look like?
- What would cost to residents be?
 - Upfront and over time
 - Cost determinants
- Pros and Cons

This option addresses Town Center only

- Cost/benefit comparison may differ for other areas of Island

The cost comparison is relevant to homeowner with existing well with 20 yr remaining service life



CWS Assumptions

Basic configuration

- Well field and treatment system in Sachem's Woods
- Transmission main south along Rt. 114 to Town Center
- Distribution mains to serve:
 - Public buildings: School, Library, Town Hall, Building Dept, Justice Hall, Police Sta., Fire Dept.
 - Presbyterian Church, American Legion Hall
 - Commercial buildings along Rt. 114 from IGA to Town Center
 - 175 metered customer connections (includes above and residents along route who choose to connect to system.)



CWS Funding Assumptions

System Component

- Wellfield, treatment infrastructure, 75 ft. of main/customer incl. surface restoration
- Transmission main Rt. 114, distribution mains in excess of 75 ft. of main/customer, service line to property line, meter pit, curb stop, meter
- Service line from meter pit to in-house plumbing
- SCWA owns infrastructure

Funding Source

- Financed by SCWA, recovered in SCWA base rate and Tap Fee paid by customer
- Financed by Town or SCWA and recovered in rates paid by customers via Capital Surcharge
- Customer pays for service line



CWS - Customer Cost Components

Customer pays

- Up-front:
 - Tap Fee to SCWA to connect
 - Cost of service line from property line to house/business
- Through Rates over time:
 - SCWA Fees consisting of
 - Fixed Quarterly Fee
 - Fixed Quarterly Environmental surcharge
 - Consumption charge
 - Capital Surcharge to cover
 - Financing costs for distribution mains not paid by SCWA



CWS Estimated Residential Customer Cost

Upfront Fees:

- SCWA Tap Fee \$4,800
- Est. Customer Service Line \$4,000
- **Total** **\$8,800**

Annual Fees (same structure applies to WNWD)

- Fixed Fee \$277.44
- Fixed Environmental fee \$ 80.00
- Consumption Charge \$ 2.35/kgal **
- Capital Surcharge \$ 8.46/kgal
- **Total** **~\$1,147.00**

Est. 20 yr. Cost (NPV @3%) ~\$25,864

** Assumes per household (2.3 pp) = 200 gl/day x 365 days/yr.



CWS Evaluation

Effective

- Potable drinking water
- All service and water quality requirements provided by operator

Implementation

- Community decision-making could be slow and complex
- System operator constructs infrastructure
- Technology risks are low

Cost

- Est. NPV over 20 yr = \$25,864

Risks

- Future rates driven by SCWA system-wide quality compliance requirements, spread over all SCWA customers.



Summary Cost Comparison for Home with Well with 20 yr. Service Life

<u>Option (Note 3)</u>	<u>Est. 20 Yr. Cost (NPV @3%)</u>
● Well #1	\$19,000 - \$23,000
● Well #2	\$17,000
● Well #3	\$25,000
● CWS	\$26,000



Pros & Cons - Excluding Cost

Private Well Treatment

PROS

- Allows site-specific remedy
- Customer treats water to their desired standards
- Implementation can be quick, technology risk is low, qualified private vendors available to install and maintain systems

CONS

- Customer oversees equipment installation, annual equipment maintenance and water quality testing
- Customer bears all capital & operating costs to achieve desired water quality
- Drinking water and wastewater commingled on property, may restrict ability to address root cause of contamination

CWS

PROS

- Professional, highly regulated provider is responsible for water quality and service reliability
- Continuous monitoring for public health threats
- Septic systems separated from water supply enabling solutions in finding root cause of contamination
- Costs of meeting potable water quality shared across thousands of customers.

CONS

- Customer bears cost of water which exceeds potability standards (ex. Nitrates <10 mg/L)
- Implementation requires community decision, likely to be complicated and slow
- S.I. rates impacted by water quality compliance costs across entire SCWA system



Summary

Depending on quality of untreated well water, the 25 yr. NPV costs of private well options are roughly the same or slightly less than the 25 yr NPV costs of CWS option. In 2/5 scenarios, the cost differential is within the margin of error of the analysis.

Private well options:

- Leave responsibility for service reliability and future quality compliance with homeowner
- Require homeowner to do the following:
 - Annual water testing, understanding and acting on results
 - Replace filters at recommended intervals
 - Execute system maintenance contract; maintain well equipment and upgrade at homeowner expense if required
 - Make sure all household members drink from kitchen sink only
 - Depending on quality of untreated well water, there may be an increased health risk

CWS options:

- Shifts responsibility for service reliability and future quality compliance to highly regulated, professional org.
- Shifts decision-making authority about price and system configuration to professional org.
- May support options to address aquifer contamination on each lot





CWS - Capital Surcharge Detail

- Capital Surcharge comprises ~50% of annual cost. Explain it!
- Capital Surcharge recovers principal & interest on bonds issued to pay for distribution mains not funded by SCWA & recovered through its base rates
- Assumptions:
 - Capital Cost not funded by SCWA \$2.3 million (Note 4)
 - Financing Term* 25 years
 - Interest Rate** 3.2%
 - Annual Principal & Interest \$135,045
 - Assumed System Production *** 15,968/kgal
 - Capital Surcharge in k/gal \$8.46/kgal
 - Annual Residential Customer Cost**** \$617.58/customer/yr

*Same as WNWD

**Approximate market yield for 25 yr AAA rated tax-exempt bond

***175 customers x 250 gal/day x 365 days/yr

****200 gal/day x 365 days



NOTES

1. Capital costs for well treatment options include an average of estimates provided by suppliers, plus contingency for unforeseen conditions. Annual costs include service recommended by suppliers plus electricity, annual water testing, one (1) hour service call, one \$2,000 repair and replacement expense in year 10.
2. Costs are expressed in 2024 money; future costs are discounted to present value at a 3% real rate.
3. NPV costs of each private well treatment option assume the well has a 20 year service life. If the well needs to be replaced or relocated, NPV costs should be increased by ~\$10,000.
4. Provided by Town Engineer and based on SCWA policy of providing 75 ft. distribution main for each new customer.