

# Village Wastewater Solutions

Assistance for Rural Communities

Department of Environmental  
Conservation (DEC)  
**Lynnette Claudon, PE**



# What's in wastewater?

- High BOD (Biological Oxygen Demand)
- High TSS (Total Suspended Solids)
- High phosphorus (& nitrogen)
- Low pH may be below 5 (prohibited by federal regulation) or 5.5 (commonly prohibited by local sewer ordinance)
- Low dissolved oxygen
- Flow volume and strength is irregular

# How are food and beverage business different?

	Domestic sewage	Brewery process wastewater*	Beer	Dairy process wastewater*	Milk
<b>BOD (mg/L)</b>	250 - 300	2,500 – 12,000+	>60,000	1,500 – 3,000	>100,000
<b>TSS (mg/L)</b>	~300	500 - >15,000			
<b>pH</b>	7	5 - 6	4.5		
<b>Oil &amp; grease (mg/L)</b>				300 – 800	~3,600
<b>Phosphorus (mg/L)</b>	<10	20 - 40		35 - 50	>900

**\* Varies A LOT depending upon pollution prevention practices**

# A sewer connection is no magic bullet

Pre-treatment permit from DEC Wastewater Program required for businesses whose wastewater:

- >5% of facility's BOD capacity
- >5% of facility's hydraulic capacity
- $\geq 25,000$  GPD process wastewater
- Can adversely impact the proper operation of the plant or pass through without proper treatment

*Existing businesses that significantly change their business or size should get a new determination*

**Municipalities can regulate small facilities at the local level**

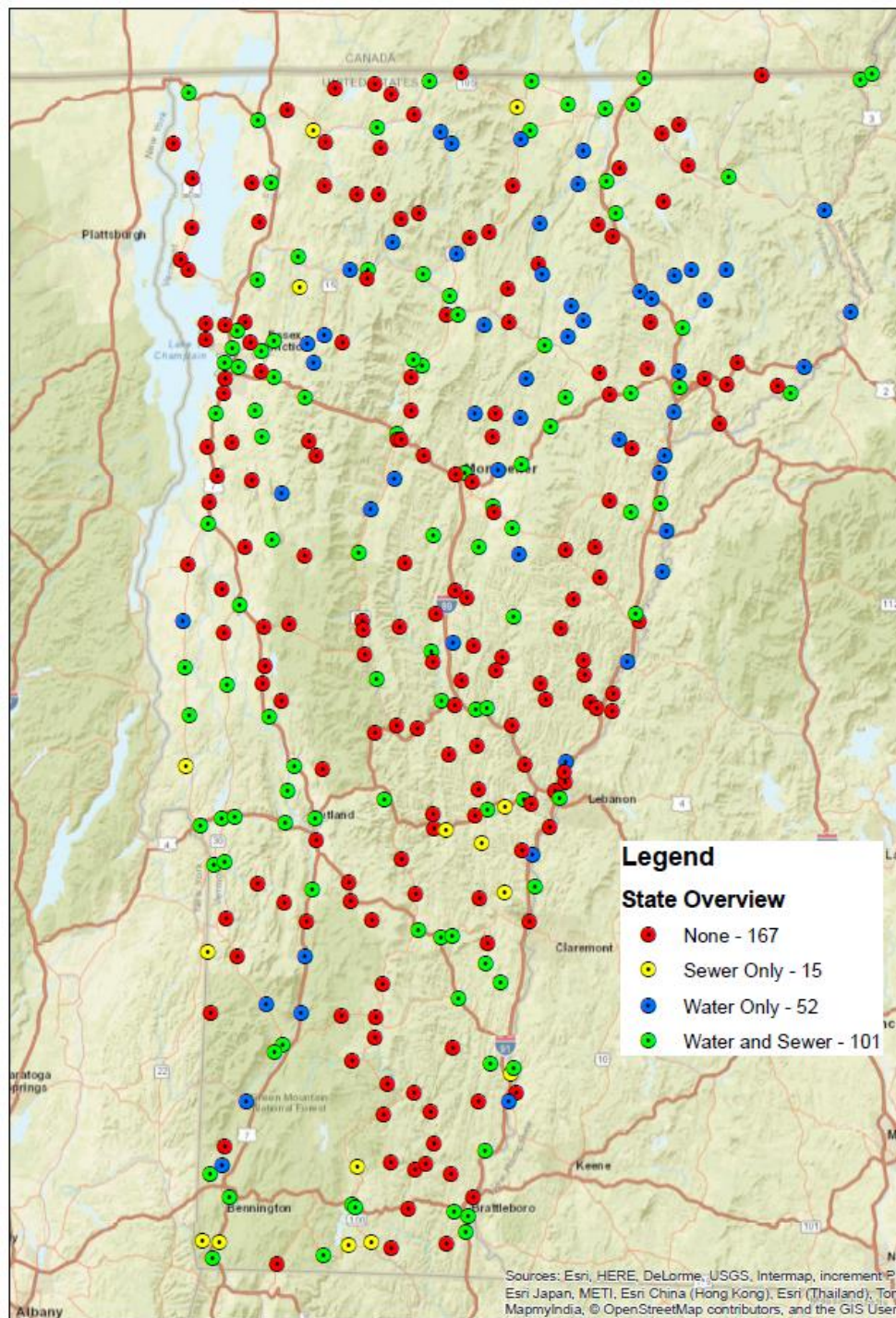
# Solutions for Food-Related Businesses in Un-Sewered Villages





# Half of Vermont's Villages Lack Community Wastewater Facilities

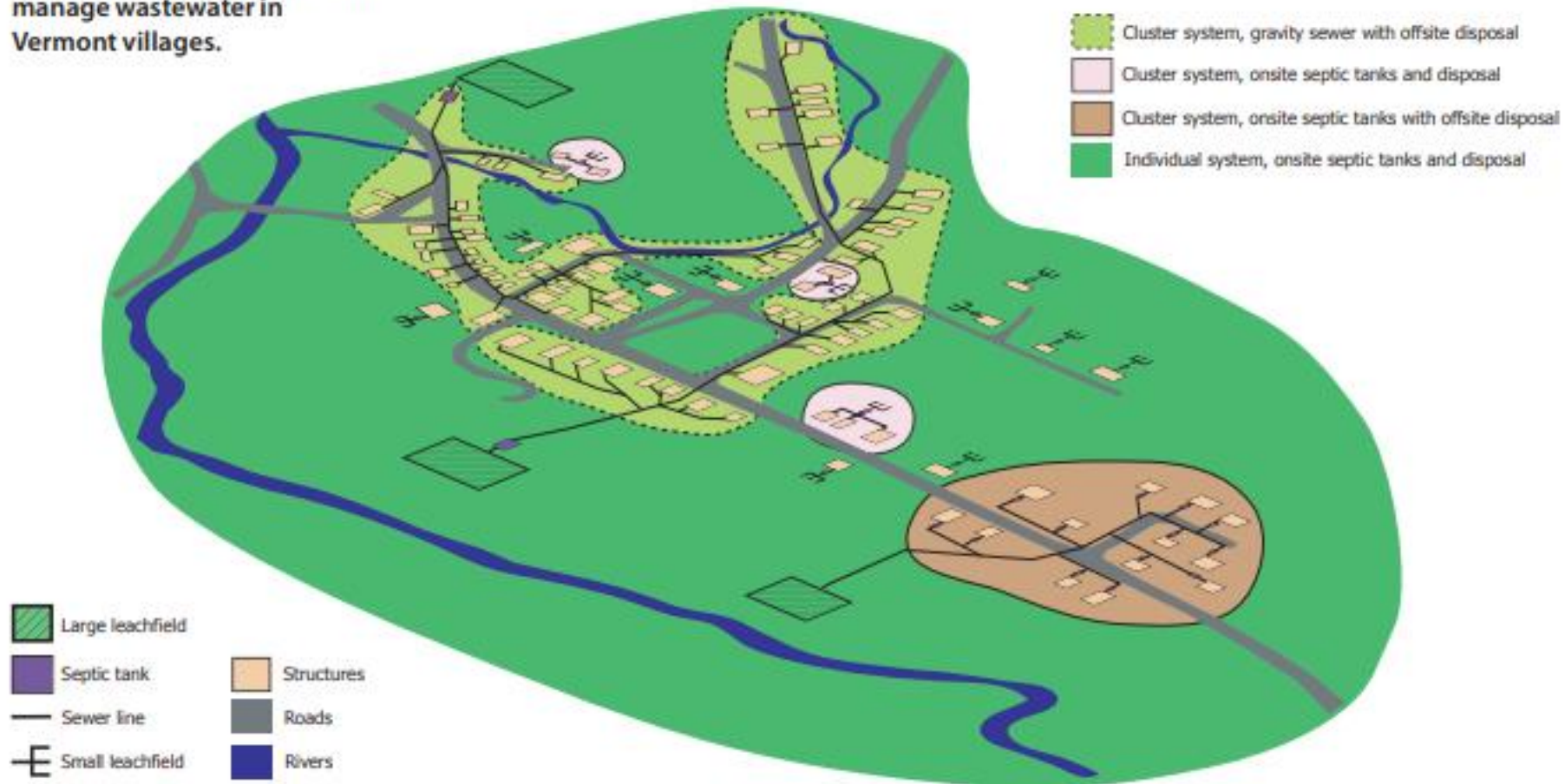
- Limits opportunities for redevelopment and revitalization
- Businesses have trouble expanding
- Hard to establish water-intensive businesses like food processing, restaurants and breweries
- Housing needs aren't met
- Limits ability to provide services like school lunches and senior housing
- Limits community gathering opportunities
- Potential public health and water quality impacts



# Sewage Solutions – Likely to be Decentralized

Multiple ▪ Small-Scale ▪ Incremental ▪ In-Ground Disposal

A variety of collection and treatment solutions can be used to manage wastewater in Vermont villages.



## Wastewater Needs and Challenges

Health & Environment	Economic	Cultural
eColi or other TMDL affecting watershed	Allow for growing or maintaining businesses/uses	Redeveloped town halls and meeting spaces
Failed septic systems	Maintain existing development	Historic preservation efforts
Environmental & Physical Constraints: high ledge, poor soils, high groundwater, isolations zones, rivers & ponds, small lot sizes	Funding & Indebtedness	Libraries and small museums
Private well contamination by sewer	Local general store, shops & restaurants	Churches
Increased discharges from new public drinking water system	Local facilities	Supporting recreation



# Permit Thresholds for the 2 Onsite Wastewater Programs

- Regional Office Water/Wastewater Permit From 1-6,499 gallons per day (GPD) design flow wastewater system
- Indirect Discharge Permit 6,500 GPD and greater design flow wastewater system
  - 6,499 gpd = 26 residential living units/houses

# Examples of Wastewater System Capacities for a Change in Use

Building Uses	Original Use as a Single Family Residence Size and Design Flow	Original Use as a School (20,000 SF) Size and Design Flow
Original Use	3 Bedrooms, <b>450 GPD</b>	75 pupils & 25 staff, <b>2,022 GPD</b>
Nursing Home	3 Beds, <b>375 GPD</b>	16 Beds, <b>2,000 GPD</b>
Restaurant Use (Also Needs Grease Tank)	2 meals, 15 seats, <b>450 GPD</b>	60 seats, 2 meals, <b>2,000 GPD</b>
Daycare	19 children, 2 staff, <b>450 GPD</b>	100 children & staff, 1 meal, <b>2,000 GPD</b>
Small Dry Goods Store	4 small stores, <b>400 GPD</b>	20 small stores, <b>2,000 GPD</b>
Office Space	12 employees, 6 conference room seats, <b>450 GPD</b>	55 employees, 20 conference room seats, <b>2,020 GPD</b>

**GPD = Gallons Per Day**





# Working Together on Solutions

- Vermont Departments of:
  - Environmental Conservation (ANR)
  - Housing and Community Development (ACCD)
- US Department of Agriculture – Rural Development
- Vermont's Regional Planning Commissions

# Barriers and Small Steps to Solutions



# Village Wastewater & VT Planning Goals

*Vermont State Planning Goal (24 V.S.A. § 4302): To plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside...*



The Lamoille County Seat, Hyde Park Village is served by community wastewater and water supply systems, allowing a denser, village-scale development pattern.

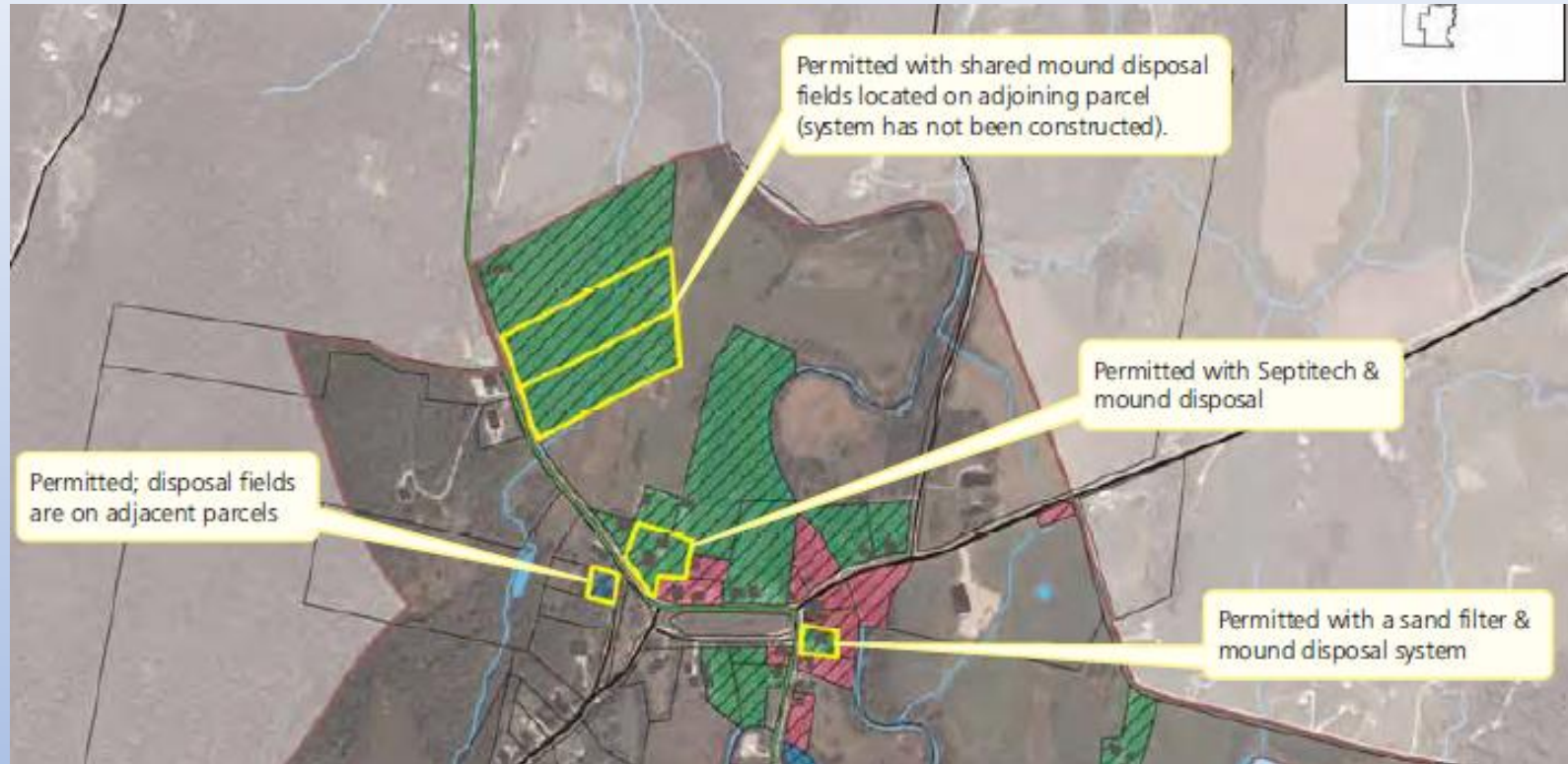
# Wastewater Key to Village Redevelopment



Lack of wastewater capacity limits potential options for reuse of former Bucks Furniture buildings on “Main Street” (Route 15) through Wolcott Village.



# Communities Face Many Common Barriers to Onsite Wastewater



Map of properties with barriers to onsite wastewater systems in the Westford Town Center. Barriers include small lot sizes, shallow soils, high water table and proximity to surface waters.

# Don't Be Your Own Barrier



What are your goals? If your community needs/wants more residential or food based businesses in the Village, you may need to plan ahead for FUTURE wastewater capacity, but don't let that stop you from doing something TODAY!



# Planning and Zoning for Villages without Wastewater

- Ensure a customer base for future food based businesses, and user base for future community wastewater
- Zoning that allows mixed uses can enable more efficient use of limited onsite septic capacity:
  - Food based businesses need a LOT of septic capacity,
  - Retail and office require very little septic capacity
  - A small store or office with a 1-2 bedroom apartment above needs less septic capacity than a single family home.

# Planning and Zoning for Villages without Wastewater

- Allow offsite parking -- more flexibility and more land available for onsite septic, wells/well shields, and stormwater treatment
- Use Floor to Area Ratio (FAR) or Lot Coverage rather than minimum lot size to regulate # of units
  - Allow more, small dwellings
  - Create housing diversity in your community
  - Set stage for future development when/if new technologies allow more capacity
  - 1.5 MINIMUM FAR to create a walkable street scape.

# Looking for Wastewater Solutions – Westford

- 2007: Feasibility Study funded through Planning Advance
- 2010-2014: Conduct Onsite Soil Tests for small shared systems
  - Municipal Planning Grants and Local Funds
  - Town Office and Library -- leach field under parking lot (Oh No)
  - Red Brick Meeting House -- No Capacity
  - White Church – 1,000 gpd (Capacity for church and town office -- Yay!!!)
- 2015-2018: Jackson Farm Property Became Available
  - 12,600 gpd – Capacity existing uses plus new development
  - “Preliminary” engineering design
  - Property purchased in 2017 as part of larger Conservation Project
  - Exploring “phasing” and funding/financing alternatives



# Can my Town afford to even think about this?

## Can you afford not to?

- Much of rural Vermont is losing population, grand list value, or both
- Can existing businesses in your Town grow/expand? Where would a new one start?
- Do older residents have a place to “step down” to smaller housing” in your Town?
- Can younger residents find entry level housing in your Town?

# Planning Advances

Funding Available to Un-Sewered Municipalities

Planning  
Advance



Additional  
Study



Preliminary  
Engineering  
Report



Final  
Design



Construction



# Planning Advance Examples

	Arlington	West Windsor	
Planning Advance Year	1978	2012	
Construction Year	Never	2017	
Planning Advance Amount	\$25,598.45	\$16,000	
Current Balance	\$25,598.45	\$0, PC Grant Awarded	
Total Project Cost	\$0	\$2,310,144	
Total Loan After Grants	\$0	\$985,846	
User Rate	\$0	\$216.25/qtr (2018)	

# CASE STUDIES

# 2003 Warren, Vermont

- Community Decentralized Wastewater System
  - 5 individual system refurbishments
  - 7 individual system replacements
  - 2 small cluster systems with 2-4 properties
  - 24 properties to a shared system
  - 46 properties to a large shared system
  - Alternative treatment at school
- User Fees: **\$450-\$700/year**

Project Element	Estimated Cost	EPA Demo Grant
Needs Assessment-Facilities Plan	\$462,000	\$300,300
Final Design	\$386,200	\$267,400
Construction	\$2,585,070	\$293,900
Construction Engineering Services	\$448,630	\$189,000
Existing System Capital Payback	\$305,300	\$198,400
Other Services	\$140,100	\$0
EPA Demo Only	\$334,700	\$251,000
<b>Total</b>	<b>\$4,662,000</b>	<b>\$1,500,000</b>

Table 1: Warren Total Project Costs

Source	Amount
EPA Demonstration Grant	\$1,500,000
EPA State & Tribal Assistance Grant (STAG)	\$1,301,000
Vermont State Pollution Abatement Grant / Match	\$930,000
Local Share - SRF Loan	\$791,000
Local Share - Town Meeting Allocations/Match	\$140,000
<b>Total</b>	<b>\$4,662,000</b>

Table 2: Warren Total Project Funding Summary

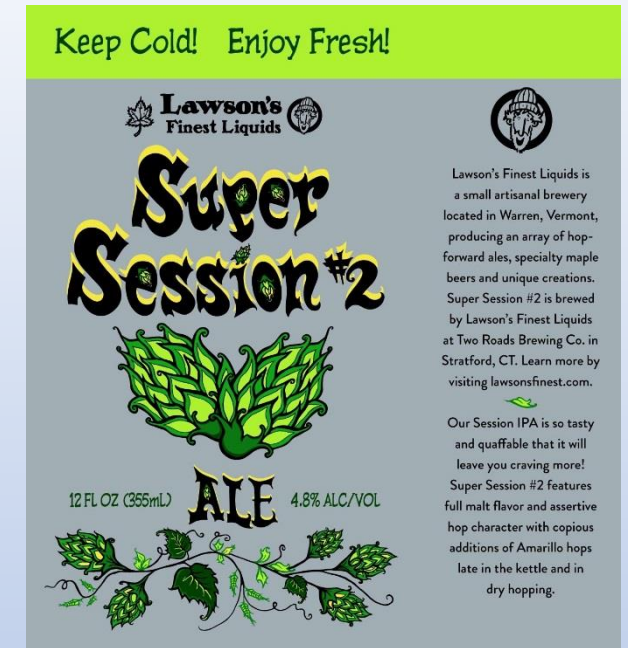


# • 2012-Present Waitsfield, Vermont

- 2012 Constructed a new drinking water system (DWSRF & STAG)
- 2012-present - Created a community loan program
  - Built indirect discharge system for Winterpark (industrial park)
  - Built 4 wastewater disposal fields for individual businesses
  - Built wastewater disposal field for new town offices

# 2012- Present Waitsfield, Vermont

- Food related Projects included:
  - Local Folks Smokehouse
    - High strength wastewater on an individual business septic system
      - Bioclere trickling filter with clarifier
  - Lawson's Finest liquids
    - High strength wastewater with a pretreatment system for high strength wastewater
      - Bioclere trickling filter with clarifier
  - The Big Picture Theatre
    - Pretreatment system as part of an indirect discharge system





## 2016 Brownsville, Vermont

- Ascutney Mountain Ski Area was going bankrupt
- Purchased Ascutney mountain sewer system with CWSRF loan
- Irene damaged village septic systems
- Constructed village collection system & refurbished mountain sewer
- Debt repayment split between grand list & user fees
- User Fees: **\$865/year**



# 2018 Rochester, Vermont

- Has 3 community soil based system sites & 1 reserve site
- Originally built in 1970's for 66,150 gpd to end straight pipes
- Rebuilding disposal field 2018
- Maintaining a vital village area
- User Fees: **\$340/year**

Summary of Financial Status – FY2017	
Average annual single family home bill	\$340
Annual amount billed	\$55,377
Current long-term outstanding debt*	\$649,642
Current annual debt payment (through 2040)*	\$54,060
Current annual operation and maintenance costs	\$58,476
Annual dedicated reserve contribution	\$0 to \$4,000

\*Debt service is financed by the entire Town tax base.

Step	Costs	Funding Source
Planning	\$11,068	CWSRF
Design	\$35,996	CWSRF
Construction	\$463,072	CWSRF
Other	\$11,000	CWSRF
Total	\$499,000	\$249,500

# Rochester Village

- Robust village downtown area
  - Mixed uses supported include:
    - Café, pub, restaurant
    - Grocery store, hardware store, other stores
    - Gas station
    - Office spaces
    - Single and multi-family residences



# Grafton Villages Pump Out Program

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Sewer feasibility study indicated a construction cost ranging from \$3-4M

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Town created a septic tank pump out ordinance for the village areas

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User Cost: Approximately **\$300** every five years.

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Owners must submit proof of pump out to the Town.

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Town still concerned with ability to grow or redevelop village properties with small lots.



Can my Town afford to even think about this?  
Can you afford not to?  
To sewer or not to sewer...



# Where to Find Help

PROGRAM	ASSISTANCE AVAILABLE	CONTACT
Vermont Pollution Control Planning Advance	Planning advances for unsewered villages	<b>Lynnette Claudon</b> <a href="mailto:Lynnette.Claudon@Vermont.gov">Lynnette.Claudon@Vermont.gov</a> 802-490-6226
Vermont Clean Water State Revolving Fund (CWSRF)	Planning, design, and construction loans for clean water projects, currently no funding cap.	<b>Tom Brown</b> <a href="mailto:Thomas.Brown@vermont.gov">Thomas.Brown@vermont.gov</a> 802-622-4205
Vermont Drinking Water State Revolving Fund (DWSRF)	Planning, design, and construction loans for drinking water projects, currently no funding cap.	<b>Ashley Lucht</b> <a href="mailto:Ashley.Lucht@vermont.gov">Ashley.Lucht@vermont.gov</a> 802-585-4904
USDA-RD	Construction loans and grants for clean water and drinking water projects & more.	<b>Jon Muise</b> <a href="mailto:jon.muise@vt.usda.gov">jon.muise@vt.usda.gov</a>
Municipal Planning Grant (MPG)	State grants up to \$22,000 fund a wide range of community planning needs.	<b>Faith Ingulsrud</b> <a href="mailto:Faith.Ingulsrud@vermont.gov">Faith.Ingulsrud@vermont.gov</a> 802-839-0964
Vermont Community Development Program (VCDP)	Federal grants for Planning and implementing projects that benefit people of low and moderate incomes.	<b>Nate Cleveland</b> <a href="mailto:nathan.cleveland@vermont.gov">nathan.cleveland@vermont.gov</a> 802-828-2998
RCAP Solutions	Assistance with planning, finance, project development, administration, operation and maintenance. Free for eligible communities.	<b>Mark Johnson</b> <a href="mailto:mjohnson@rcapsolutions.org">mjohnson@rcapsolutions.org</a> 802-505-1037
CVRPC	Community organization support, education & outreach, proposal development, plan elements, and project administration.	<b>Clare Rock</b> <a href="mailto:rock@cvrpc.org">rock@cvrpc.org</a> 802-229-0389
Vermont DEC Environmental Assistance Office	Information resources and non-regulatory environmental compliance assistance to municipalities and businesses	<b>Ed Antczak</b> <a href="mailto:Ed.Antczak@Vermont.gov">Ed.Antczak@Vermont.gov</a>
Village Center Designation	State designation supports the historic center and targets training and financial incentives to bring additional public and private investment to the village.	<b>Richard Amore</b> <a href="mailto:Richard.Amore@Vermont.gov">Richard.Amore@Vermont.gov</a>

YOU CAN GET THERE FROM HERE.

Questions?

Lynnette Claudon, PE

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802-490-6226

