

**TOWN OF WESTFORD, VERMONT
COMMUNITY WASTEWATER DISPOSAL SYSTEM
SUPPLEMENTAL PRELIMINARY ENGINEERING REPORT**

STATE LOAN: RF1-267-1.0

FEBRUARY, 2022

TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF APPENDICES	ii
LIST OF FIGURES	ii
SECTION I	<u>CONCLUSIONS AND RECOMMENDATIONS</u>
A.	Conclusions I – 1
B.	Recommendations I – 2
C.	Project Costs and Financing I – 2
SECTION II	<u>WASTEWATER ALTERNATIVES</u>
A.	Design Criteria and Description of Alternatives II – 1
B.	Alternatives Analysis II – 3
SECTION III	<u>PROJECT COSTS</u>
A.	Construction Costs III – 1
B.	Total Project Costs III – 1
C.	Operation and Maintenance Costs III – 1
SECTION IV	<u>PROJECT FINANCING</u>
A.	State and Federal Funding IV – 1
SECTION V	<u>PROJECT SCHEDULE</u>
	V – 1

TABLE OF CONTENTS

(Continued)

LIST OF APPENDICES

APPENDIX A	Figures
APPENDIX B	Opinions of Probable Total Project Costs and Operation & Maintenance Cost

LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
1	Alternative #4 Disposal System Layout	Appendix A
2	Alternative #5 – Drip Dispersal System Layout	Appendix A

SECTION I

CONCLUSIONS AND RECOMMENDATIONS

SECTION I

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this Supplemental Report is to introduce an innovative alternative as well as update and further evaluate a the previously recommended alternative for a community wastewater disposal system for the Town of Westford, Vermont. New information regarding the depths to restrictive features and bedrock has resulted in an increase in the wastewater disposal capacity available at the Maple Shade Town Forest site providing an opportunity to re-examine the project since the previous Updated Preliminary Engineering Report by Stone Environmental, Birchline Planning, LLC and Green Mountain Engineering, dated May 21, 2021 was submitted.

Additional interest within the collection system has also introduced additional cost for planned connections and an uncertain bidding climate has contributed to a recommendation to anticipate higher unit prices for the project. Finally, ledge quantities have been increased based on the additional connections and observed field conditions.

Project financing commitments have been received, which have introduced a need to split the overall project into two construction contracts, which is not unusual for projects of this size, but can introduce more complexity with regard to bidding and coordination during construction phase.

This Supplemental Preliminary Engineering Report updates the recommendations while outlining the changes to the initial flow projections for the project, disposal field layouts and capacity for each alternative and has been prepared at the request of the Town of Westford Planning Commission. This report includes opinions of probable, costs comparisons of long-term costs and updates project financing for the recommended option.

A. CONCLUSIONS

1. Further hydrogeologic evaluation of the Maple Shade Town Forest site has revealed disposal capacities on the order of 25,000 gallons per day (gpd). The previous Preliminary Engineering Report had anticipated a disposal capacity of 12,600 gpd.
2. An innovative technology is available (drip dispersal) that can be utilized with septic tank effluent (no pretreatment required) to more efficiently dispose of wastewater given the same disposal area.
3. The current uncertainty in the bidding climate has introduced higher costs.

4. Additional connections and observed field conditions have introduced additional project costs related to increased piping and ledge conditions.

B. RECOMMENDATIONS

1. Proceed with Final Design of Alternative #5 to include a 24,300 gallon per day drip dispersal system at the Maple Shade Town Forest site.
2. Secure project financing based on the updated project costs.

C. PROJECT COSTS AND FINANCING

1. The opinion of probable total project costs for the recommended project (Alternative #5 - drip dispersal) is approximately \$2.85 million.
2. The Project financing options were calculated based on the best available information at the time of this Report and are subject to revision.
3. The utilization of State and Federal funding for this Project is dependent on the availability of funds from various sources, the Project's position on the State priority list, the readiness of the Project to proceed, and the Median Household Income of service area users as determined by an official income survey. A 2022 CWSRF Priority List Application has been submitted for the recommended project. American Rescue Plan Act of 2021 (ARPA) funds and a grant from the Northern Borders Regional Commission are also being utilized.

SECTION II
ALTERNATIVES

SECTION II

WASTEWATER ALTERNATIVES

A. DESIGN CRITERIA AND DESCRIPTION OF ALTERNATIVES

Initial Year Design Flow

Each alternative examined in this Supplemental PER utilizes the same initial year design flows, resulting in 27 initial connections to the system and 48 equivalent users (Table 1), an increase from the 23 connections and 42 ERUs, previously assumed.

Table 1. Wastewater Initial Year Project Summary

Street	Use & Design Flow (gpd)	Initial Year Flow (gpd)	Equivalent Users
Brookside Road	6 SFR x 245 gpd/SFR=1,470	1,470	6
	Common Hall 150 seats x 8 gpd/seat = 1,200	1,200	6
Cambridge Road	0 SFR x 245 gpd/SFR=245	0	0
Common Road	2 SFR x 245 gpd/SFR = 490	490	2
	1 Store x 90 gpd/store = 90 Restaurant (17seats x 27 gpd/seat)= 459	549	3
VT Route 128	10 SFR x 245 gpd/SFR = 2,450	2,450	10
	7 Apt. x 245 gpd/Apt. = 1,715	1,715	7
	Town Office & Library 10 employees x 15gpd/employee =150 140 patrons x 4gpd/patron = 560	710	4
	Brick Meeting house 115 seats x 14 gpd/seat = 1,610	1,610	8
Split Rock Place	1 SFR x 245 gpd/SFR = 245	245	1
White Church Lane	1 SFR x 245 gpd/SFR = 245	245	1
Initial Year Totals		10,648	48
ERUs <i>not</i> owned by Town of Westford			44

Disposal Field Design Criteria

As part of Final Design Phase Services, additional field work and initial calculations have been completed by Stone Environmental and a final report is pending regarding the additional hydrogeologic evaluation, which will expand

upon the information in the 2017 capacity evaluation determining depths to restrictive features and bedrock and to updating the existing disposal field capacity analysis. This information, together with initial layouts of the disposal fields has been used to determine the disposal field capacity for existing Alternative #4 and new Alternative #5.

Alternative No. 4 – Low-Pressure Sewer Collection with STEP (Septic Tank & Effluent Pump Station) tanks at each parcel, Collection Pump Station, and Pre-Treatment of Effluent prior to disposal

Alternative No. 4 includes the installation of STEP tanks at each parcel and conveyance in a common low pressure forcemain to a 5,000-gallon precast pump station located near the Town Office. Additionally, a low pressure forcemain will be constructed adjacent to the collection forcemain to convey effluent from the upper nine parcels located on Brookside Road to the dosing pump station. Effluent will then be pumped in a 3-inch low pressure forcemain to an Advantex® (or equal) pre- treatment system located off Brookside road. Effluent will enter the treatment units and recirculate within the system until the desired treatment quality is achieved, after which the effluent will be released to a 4,000-gallon pump station that will dose the community disposal field at calculated intervals.

The major Alternative No. 4 components are:

Collection and Treatment System

- Construction of 27 STEP tanks with electrical connections (1,500-5,000 gal)
- Construction of 4,070' of 1 ¼" low pressure force main (service pipes)
- Construction of approximately 3,200 feet of 3" low pressure force main
- Construction of 5,000-gallon precast concrete duplex pump station
- Construction of 4,200 feet of 3" force main
- Construction of cleanout and air release manholes (8 total est.)
- Construction of concrete valve vault

Pre-Treatment System (See Alternative #4 Site Plan)

- First Stage Treatment Units – (4) AX100 Pods
- 20,000-gallon recirculation tank with duplex recirculation pumping system
- 5,000-gallon precast concrete dosing pump station
- 10' x 10' control building

Disposal System

- Construction of the Maple Shade Forest in-ground wastewater disposal system (24,600 gpd)
 - Field #1 - (20 trenches) x (4' wide) x (100' long)
 - Field #2 - (10 trenches) x (4' wide) x (280' long)
 - Field #3 – (10 trenches) x (4' wide) x (210' long)
 - Field #4 – (10 trenches) x (4' wide) x (130' long)

- Construction of isolation gate valves
- Construction of all valving, piping, electrical panels and required appurtenances

Alternative No. 5 – Low-Pressure Sewer Collection with STEP (Septic Tank & Effluent Pump Station) tanks at each parcel, Collection Pump Station, and Drip Dispersal with no Pre-Treatment of Effluent prior to disposal

Alternative No. 5 also includes the installation of STEP tanks at each parcel and conveyance in a common low pressure forcemain to a 5,000-gallon precast pump station located near the Town Office. Additionally, a low pressure forcemain will be constructed adjacent to the collection forcemain to convey effluent from the upper nine parcels located on Brookside Road to the dosing pump station. Effluent will then be pumped in a 3-inch low pressure force main to a control building located off Brookside road. Effluent will then be pumped directly to the community drip dispersal field at calculated intervals.

The major Alternative No. 5 components are:

Collection and Treatment System

- Construction of 27 STEP tanks with electrical connections (1,500-5,000 gal)
- Construction of 4,070' of 1 ¼" low pressure force main (service pipes)
- Construction of approximately 3,200 feet of 3" low pressure force main
- Construction of 5,000-gallon precast concrete duplex pump station
- Construction of 4,200 feet of 3" force main
- Construction of cleanout and air release manholes (8 total est.)
- Construction of concrete valve vault
- 5,000-gallon precast concrete dosing pump station
- 10' x 16' control building

Disposal System

- Construction of the Maple Shade Forest drip dispersal wastewater disposal system (24,300 gpd)
- Nine dispersal areas totaling 54,600 square feet
- Construction of isolation gate valves
- Construction of all valving, piping, electrical panels and required appurtenances

C. ALTERNATIVES' ANALYSIS

The collection systems for each alternative are the same, therefore this analysis will focus on the disposal systems being considered.

Both economic and non-economic issues should be examined when comparing alternatives. Non-monetary issues such as vulnerability, method of construction and service life of each alternative should be considered. These factors may be considered subjective, but are presented for discussion purposes.

Although each of the alternatives being considered have proven track records in Vermont, currently there are no year-round drip dispersal system in the State with design flows over 6,500 gallon per day. Additionally, the revised Indirect Discharge Rules are currently being drafted which will address the drip dispersal requirements. This issue should not be considered a disadvantage of the alternative, as there are many examples of systems this size in cold regions similar to Vermont.

Drip dispersal consists of shallow, small diameter tubing installed with a vibratory plow, resulting in much less disturbance of the disposal field. The flexible layout results in a more efficient use of the available land area.

An advantage that drip dispersal has over traditional trench and stone disposal is that pre-treatment of the wastewater is not necessary, eliminating substantial capital and operation and maintenance costs.

SECTION III
PROJECT COSTS

SECTION III

PROJECT COSTS

Opinions of Probable Project Total Project Costs for each alternative are presented in Appendix B for your consideration.

A. CONSTRUCTION COSTS

Opinions of Probable Construction Cost are included in the three tables in Appendix A. The collection system related costs are considered the same for each alternative and the cost for the recommended project will be used in the following section to estimate anticipated user costs.

B. TOTAL PROJECT COSTS

Opinions of Probable Total Project Cost are presented in the two tables in Appendix A. Total project costs include construction costs plus other project-related costs such as technical services, legal and fiscal concerns, administrative costs, construction and engineering contingency, land acquisition, and interest on short-term loans.

C. OPERATION AND MAINTENANCE COSTS

General Operation and Maintenance costs are included in two tables in Appendix A. Operation and Maintenance costs are shown in the present worth analysis table to use for comparison of alternatives.

SECTION IV
PROJECT FINANCING

SECTION IV

PROJECT FINANCING

A. STATE AND FEDERAL FUNDING

The Town of Westford is eligible to receive financial assistance from the State of Vermont for the proposed project. This assistance would be from the Clean Water State Revolving Loan Fund (CWSRF) and an ARPA Grant. The town has also received a grant through the Economic Development Administration and talks are on-going regarding a revised grant amount and specifics regarding its use.

The Town has completed a Priority List Application for this project for the 2022 CWSRF Program.

State funds have some limitations associated with them. Some of those limitations are:

1. The level of funding for the program is not guaranteed. The program can be dropped or reduced in the future.
2. Priorities for the projects are established in order to allocate the available Federal and State funds.
3. Annual operation and maintenance costs are not eligible for Federal or State funds.

SECTION V
PROJECT SCHEDULE

SECTION V

PROJECT SCHEDULE

The following schedule is a proposed chronological listing of the activities that should follow the review of this Supplemental Report by the Town of Westford.

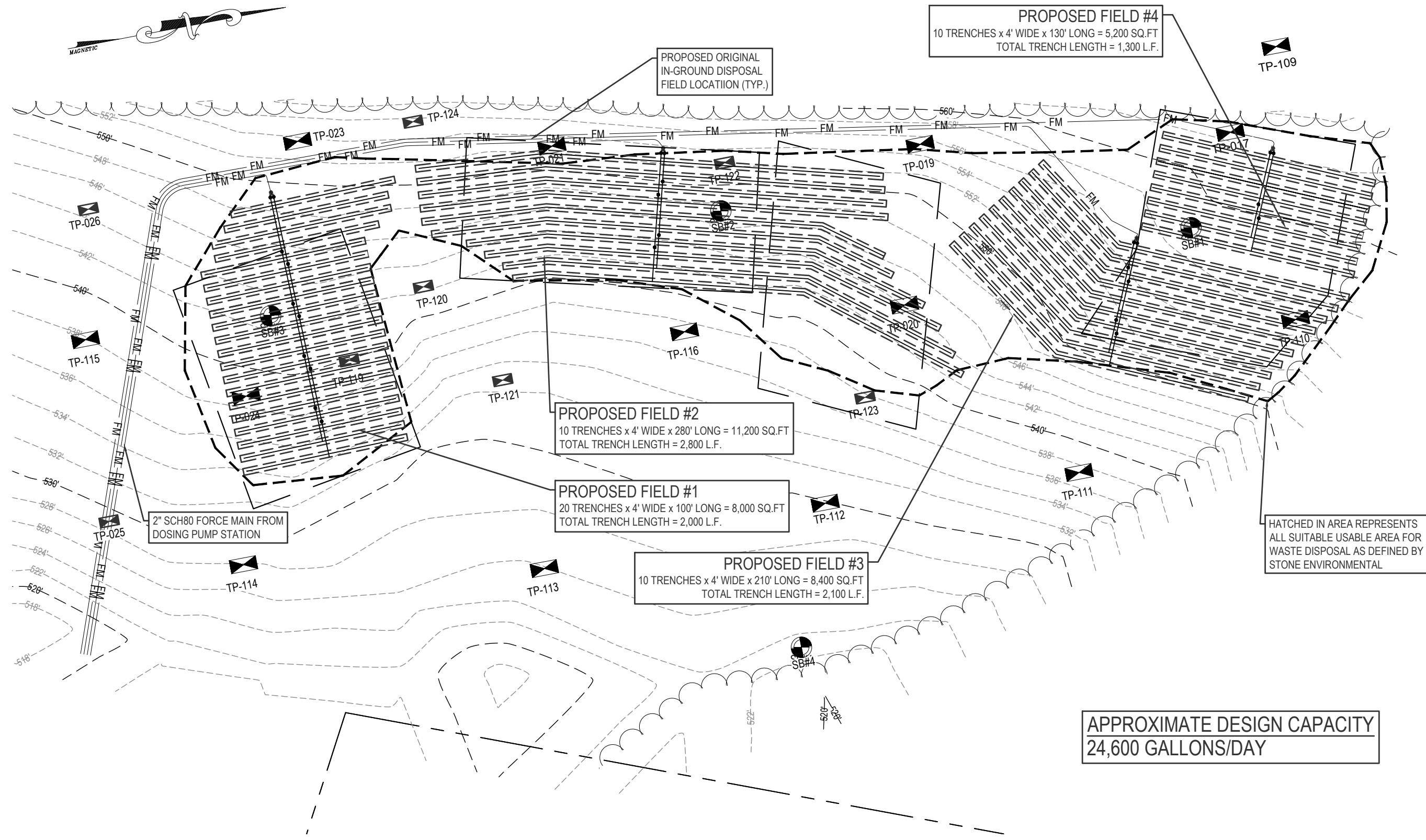
A 2022 CWSRF Priority List Application has been submitted for the project and ARPA funds are anticipated to be awarded.

Each year, new applications are received for the funds, and the projects are re-prioritized. Projects that are ready to advance, with planning complete and positive bond votes, will receive funding sooner as lingering projects are bypassed for not being ready to proceed. Therefore, the Town is encouraged to continue with planning for this necessary project as follows:

<u>Milestone</u>	<u>Date</u>
Review and approve Supplemental P.E.R.	March 2022
Submit Supplemental P.E.R. to Funding Agencies	March 2022
FONSI	April 2022
Facility Plan Approval	May 2022
Authorize Remaining Final Design of Project	April 2022
Conduct Bond Vote	November 2022
Advertise for Bids	March 2023
Begin Construction	June 2023
Complete Construction	Fall 2023

APPENDIX A

FIGURES



PROPOSED ORIGINAL
IN-GROUND DISPOSAL
FIELD LOCATION (TYP.)

PROPOSED FIELD #4
10 TRENCHES x 4' WIDE x 130' LONG = 5,200 SQ.FT
TOTAL TRENCH LENGTH = 1,300 L.F.

PROPOSED FIELD #2
10 TRENCHES x 4' WIDE x 280' LONG = 11,200 SQ.FT
TOTAL TRENCH LENGTH = 2,800 L.F.

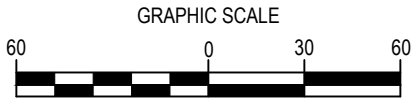
PROPOSED FIELD #1
20 TRENCHES x 4' WIDE x 100' LONG = 8,000 SQ.FT
TOTAL TRENCH LENGTH = 2,000 L.F.

PROPOSED FIELD #3
10 TRENCHES x 4' WIDE x 210' LONG = 8,400 SQ.FT
TOTAL TRENCH LENGTH = 2,100 L.F.

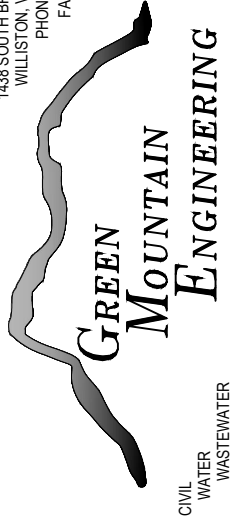
2" SCH80 FORCE MAIN FROM
DOSING PUMP STATION

HATCHED IN AREA REPRESENTS
ALL SUITABLE USABLE AREA FOR
WASTE DISPOSAL AS DEFINED BY
STONE ENVIRONMENTAL

APPROXIMATE DESIGN CAPACITY
24,600 GALLONS/DAY

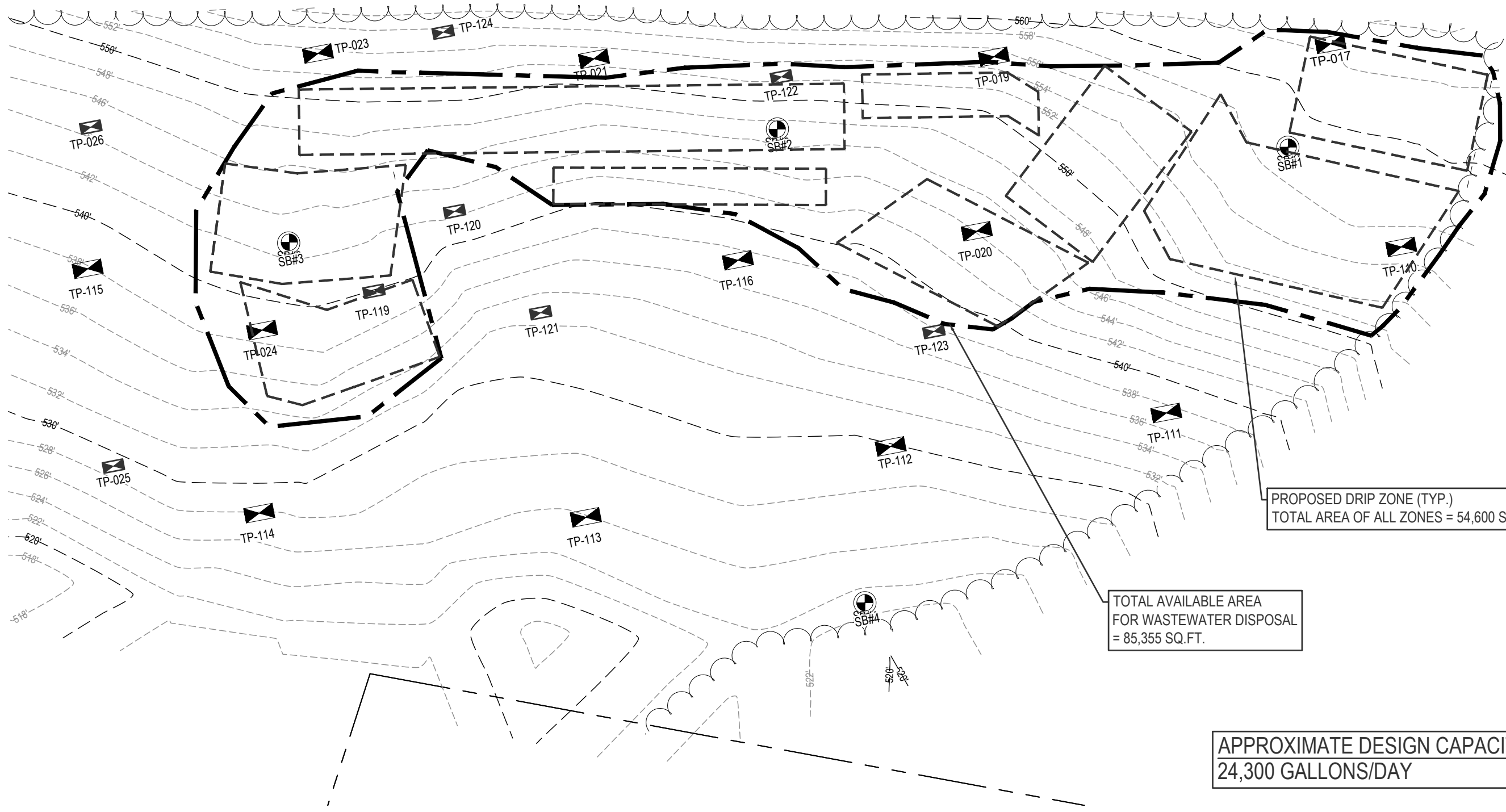


1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05405
PHONE: (802)862-5590
FAX: (802)862-7598



CIVIL
WATER
WASTEWATER

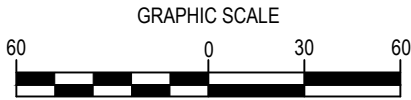
DRAWING TITLE		PROJECT		CLIENT	
ALTERNATIVE #4 IN-GROUND TRENCH DISPOSAL FIELD LAYOUT		VILLAGE OF WESTFORD COMMUNITY WASTEWATER DISPOSAL SYSTEM		TOWN OF WESTFORD, VERMONT	
DESIGNED	BW	PROJECT NO.		28-006	
DRAWN	BPC	EXHIBIT NO.		1	
CHECKED BY	AH	DATE		FEB. 2022	
PLOT DATE		SCALE		DATE	
2/16/22		1"=60'		1 OF 2	



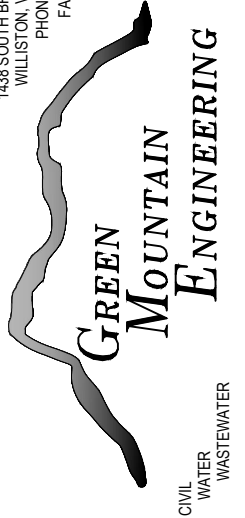
PROPOSED DRIP ZONE (TYP.)
TOTAL AREA OF ALL ZONES = 54,600 SQ.FT.

TOTAL AVAILABLE AREA
FOR WASTEWATER DISPOSAL
= 85,355 SQ.FT.

APPROXIMATE DESIGN CAPACITY
24,300 GALLONS/DAY



1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05405
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DRAWING TITLE
**ALTERNATIVE #5
DRIP DISPERSAL FIELD LAYOUT**

PROJECT
VILLAGE OF WESTFORD COMMUNITY
WASTEWATER DISPOSAL SYSTEM

CLIENT
TOWN OF WESTFORD, VERMONT

DESIGNED BY
BW

DRAWN BY
BPC

CHECKED BY
AH

PLOT DATE
2/16/22

SCALE
1"=60'

DATE
FEB. 2022

PROJECT NO.
28-006

EXHIBIT NO.
2

2 OF 2

APPENDIX B

OPINIONS OF PROBABLE TOTAL PROJECT COST AND OPERATION & MAINTENANCE COST

Town of Westford - ALTERNATIVE #4 and #5
Westford Community Wastewater Disposal System
Opinion of Probable Construction Cost - Collection System

DESCRIPTION	Unit	Quantity	Unit Price	Total Amount
A- Sewers				
A1 - 3" SDR 21 PVC LPS (lower section to common PS)	LF	1,650	\$50	\$82,500
A2- 3" SDR 21 LPS (Upper Main with 9 houses)	LF	1,550	\$50	\$77,500
A3- 3" Forcemain (from common PS)	LF	2,430	\$55	\$133,650
A4 - 6" Gravity Sewer	LF	605	\$55	\$33,275
A5- 1 1/4" Low Pressure Sewer Services	LF	4,070	\$40	\$162,800
A6- 4" Gravity Sewer Services	LF	500	\$47	\$23,500
SUBTOTAL				\$513,225
B- Sewerline Appurtenances				
B1- 5' Diameter Air Release/CO Manholes	EA	4	\$6,500	\$26,000
B2 - 5' Dia, C.O. Manholes	EA	4	\$6,500	\$26,000
B3 - Concrete Sewer Manholes	LF	18	\$1,100	\$19,800
B4 - Concrete Valve Vault	LS	1	\$5,000	\$5,000
B5- 5,000 Gallon Duplex Pump Station (lower)	EA	1	\$28,000	\$28,000
B6 - 1 1/4" Shut-off	EA	24	\$500	\$12,000
B7 - Sewer Stub	EA	10	\$400	\$4,000
B8 - Check Valve Structure	EA	5	\$4,000	\$20,000
B9 - Crossing Sleeve	LF	490	\$10	\$4,900
B10 - Cleanouts	EA	20	\$300	\$6,000
B11- 1,500 Gallon STEP Tanks (Includes Electrical and Panels)	EA	22	\$11,000	\$242,000
B12-2,000 Gallon STEP Tanks (Includes Electrical and Panels)	EA	2	\$13,000	\$26,000
B13 - 2,500 Gallon STEP Tank (Incudes Electrical and Panels)	EA	1	\$15,000	\$15,000
B14 - 3,500 Gallon STEP Tank (Incudes Electrical and Panels)	EA	1	\$20,000	\$20,000
B15 - 5,000 Gallon STEP Tank (Incudes Electrical and Panels)	EA	1	\$20,000	\$20,000
SUBTOTAL				\$474,700
C- Earthwork				
C1 - Rock Excavation	CY	1,585	\$130	\$206,007
C2- Boulder Excavation	CY	54	\$110	\$5,940
C3 - Misc. Extra and Below Grade Excavation	CY	34	\$45	\$1,530
C4 - Excavation & Replace Unsuitable	CY	152	\$180	\$27,360
C5 - Fine Grading / Mulching / Grass Seed	SY	3,615	\$11	\$39,765
SUBTOTAL				\$280,602
D- Roadwork				
D1- Permanent Bit. Pavement Repair	SY	310	\$65	\$20,150
D2- Permanent Gravel Road & Drive Repair	SY	1,160	\$50	\$58,000
SUBTOTAL				\$78,150
E-Incidental Work				
E1- Class B Concrete	CY	10	\$200	\$2,000
E2- Calcium Chloride	TON	2	\$600	\$1,290
E3- Rigid Insulation	LF	9,005	\$3	\$27,015
E4- Uniform Traffic Officers	HRS	40	\$80	\$3,200
E5- Traffic Control	HRS	432	\$70	\$30,240
E6- Silt Fence	LF	406	\$10	\$4,060
E7- Degradable Erosion Control Blankets	SY	160	\$10	\$1,600
E9- House Replumbs	EA	3	\$1,000	\$3,000
E10- Septic Tank Deactivation	EA	27	\$1,000	\$27,000
SUBTOTAL				\$99,405
F- Lump Sum Items				
F1- Tree Removal / Arborist	LS	1		\$9,900
F2- Preparation of Site and Miscellaneous Work (5% of construction)	LS	1		\$72,449
F3- Bonds (1.5% of construction)	LS	1		\$22,821
F4- Contingency (10% of all)	LS	1		\$154,425
SUBTOTAL				\$259,596
TOTALS		1		\$1,705,677

Estimate Disclaimer: The estimate is based on PRELIMINARY FINAL DESIGN phase estimates for construction and engineering. The quantities noted in the estimate are based on survey and GIS scaled unit quantities from scenario's developed by Green Mountain Engineering (GME). The quantities and unit prices will likely vary based on the actual final design..

Town of Westford - ALTERNATIVE #4
Westford Community Wastewater Disposal System - 24,600 GPD
Opinion of Probable Construction Cost - (In-Ground Trenches with Pretreatment)

DESCRIPTION	Unit	Quantity	Unit Price	Total Amount
Mobilization/Demobilization	LS	1	\$3,000	\$3,000
Silt Fence	LF	600	\$3	\$1,800
Excavate Leachfield Trenches	CY	2,450	\$8	\$19,600
Leachfield Stone	CY	1,825	\$28	\$51,100
1 1/2" Laterals	LF	8,950	\$8	\$71,600
Filter Fabric	SY	3,645	\$2	\$7,290
Topsoil	CY	80	\$25	\$2,000
3" Forcemains	LF	4,200	\$23	\$96,600
3" Gate Valves	Ea	8	\$1,200	\$9,600
Temporary Road				
Excavation	CY	445	\$8	\$3,560
Filter Fabric	SY	1,350	\$2	\$2,700
Gravel	CY	445	\$25	\$11,125
Fine Grade, Seed and Mulch	SY	18,000	\$3	\$54,000
Start-Up/Testing	LS	1	\$3,000	\$3,000
Control Building (10' x 10')	EA	1	\$40,000	\$40,000
Tanks (4) (5000 Gallons)	L.S.	1	\$85,000	\$85,000
Excavation / Yard Piping	L.S.	1	\$45,000	\$45,000
Controls / Wiring / Telemetry /Pumps	EA	1	\$35,000	\$35,000
New Electrical Service (2) (new pump stations)	EA	2	\$10,000	\$20,000
backup Generators & Appurtenances	EA	2	\$25,000	\$50,000
Advantex Pre-Treatment	LS	1	\$219,000	\$219,000
Preparation of Site and Miscellaneous Work (5%)	LS	1	\$41,549	\$41,549
Bonds (1.5%)	LS	1	\$13,088	\$13,088
Contingency (10%)	LS	1	\$88,561	\$88,561
SUBTOTAL				\$974,173
USE				\$975,000
Notes: The estimate is based on PLANNING phase estimates for construction and engineering. The quantities noted in the estimate are based on GIS scaled unit quantities from scenario's developed by Green Mountain Engineering (GME). GME bears no responsibility for prices and quantities noted in the estimate, beyond the planning phase. The quantities and unit prices will likely vary based on the actual design, site conditions.				

Town of Westford
Westford Community Wastewater Disposal System
Opinion of Probable Total Project Cost - ALTERNATIVE #4 (24,600 GPD)

DESCRIPTION	Total Cost
Construction	
Wastewater Collection System	\$1,705,677
Wastewater Disposal System & Control Building	\$974,173
Construction Subtotal	\$2,679,850
STEP I- Preliminary Engineering	
STEP I- Preliminary Engineering Subtotal	\$39,050
STEP II- Final Design Engineering	
Final Design (includes \$10K additional archeological services)	\$174,954
STEP II- Final Design Subtotal	\$174,954
STEP III- Construction Engineering Services	
Construction Phase Engineering	\$200,000
STEP III- Construction Engineering Subtotal	\$200,000
Other Costs	
² Administrative (Force Account)	\$32,775
³ Administrative (other)	\$5,000
Land Acquisition / Current Use / Easements	\$30,000
Permitting Fees	\$3,055
⁴ Income Survey	\$15,000
Easement Assistance	\$10,000
⁵ Legal & Fiscal	\$26,799
Short Term Interest (0.05% of SRF eligible engineering + construction costs)	\$15,274
Other Costs Subtotal	\$137,903
SUBTOTAL	\$3,231,757
USE	\$3,232,000

Notes

- 1 - Construction Engineering based on State Fee Curve
- 2 - Compensation for Westford Employee (Project Manager) Est. @ (\$34.50/hour) * (950 hours) = \$32,775
Step II = (371 hours) * (\$34.50) = \$12,799.50 Step III = (579 hours) * (\$34.50) = \$19,975.50
- 3- Administrative services including printing, mailing and general administrative duties
- 4 - GME has not received a quote for the income survey. Estimated @ 15k
- 5 - Legal and fiscal estimated at 1% of construction costs

Town of Westford
Westford Community Wastewater Disposal System - Preliminary Engineering Report
Opinion of Probable First Year Operation & Maintenance Costs - Alternative #4

Cost Category	O&M Cost
Contract Operations	\$28,600
Electrical	\$5,500
Septage Pumping	\$2,500
Annual Engineering Inspection (includes operator inspection of STEP tanks)	\$2,500
IDP Inspection & Report	\$1,500
Pre-Treatment System Inspection	\$1,500
IDP Operating Fee	\$872
Capital Replacement	\$1,500
Insurance	\$500
Misc. Repairs	\$2,000
Billing	\$500
O&M Cost Total	\$47,472

Notes: The estimate is based on PRELIMINARY phase estimates for O&M Costs. The estimate is based on scenario's developed by Green Mountain Engineering (GME). GME bears no responsibility for prices and quantities noted in the estimate, beyond the preliminary phase. The costs will likely vary based on the actual design, site conditions. Contract Operations is based on \$55/hour x 520 hr/yr. Electrical is based on \$0.17/kw-hr. Each homeowner pays for their own STEP system electrical cost. Septage pumping is based on 1/4 systems pumped each year at a cost of \$300/pump out.

Town of Westford
Community Wastewater Disposal System - (24,300 GPD)
Opinion of Probable Construction Cost - Alternative #5 - Drip Dispersal System

DESCRIPTION	Unit	Quantity	Unit Price	Total Amount
Mobilization/Demobilization	LS	1	\$5,000	\$5,000
Silt Fence	LF	600	\$3	\$1,800
Topsoil	CY	80	\$25	\$2,000
2" Forcemains (Disposal Field Services & Header)	LF	3,000	\$15	\$45,000
Temporary Road				
1. Excavation	CY	445	\$12	\$5,340
2. Filter Fabric	SY	1,350	\$2	\$2,700
3. Gravel	CY	445	\$25	\$11,125
Mound Sand Allowance	CY	200	\$35	\$7,000
Bedrock Removal	CY	100	\$130	\$13,000
Fine Grade, Seed and Mulch	SY	5,000	\$3	\$15,000
Oakson Supplies Per Proposal (tubing, header, manifold, pumps etc.)	L.S	1	\$130,000	\$130,000
Start-Up/Testing	LS	1	\$3,000	\$3,000
Control Building (10' x 16')	EA	1	\$60,000	\$60,000
Tanks (4) (5000 Gallons)	L.S.	1	\$85,000	\$85,000
Excavation / Yard Piping	L.S.	1	\$45,000	\$45,000
Controls / Wiring / Telemetry /Pumps	EA	1	\$20,000	\$20,000
New Electrical Service (2) (new pump stations)	EA	2	\$10,000	\$20,000
Backup Generators & Appurtenances	EA	2	\$25,000	\$50,000
Preparation of Site and Miscellaneous Work (8%)	LS	1	\$12,048	\$12,048
Bonds (1.5%)	LS	1	\$7,995	\$7,995
Contingency (10%)	LS	1	\$54,101	\$54,101
SUBTOTAL				\$595,109
USE				\$596,000

Notes: The estimate is based on PRELIMINARY FINAL DESIGN phase estimates for construction and engineering. The quantities noted in the estimate are based on survey and GIS scaled unit quantities from scenario's developed by Green Mountain Engineering (GME). The quantities and unit prices will likely vary based on the actual final design..

Town of Westford
Westford Community Wastewater Disposal System - 24,300 GPD
Opinion of Probable Total Project Cost - ALTERNATIVE #5 (DRIP DISPERSAL)

DESCRIPTION	Total Cost
Construction	
Wastewater Collection System	\$1,705,677
Wastewater Disposal System	\$595,109
Construction Subtotal	\$2,300,786
STEP I- Preliminary Engineering	
STEP I- Preliminary Engineering Subtotal	\$39,050
STEP II- Final Design Engineering	
Final Design (includes \$10K additional archeological services)	\$174,954
STEP II- Final Design Subtotal	\$174,954
STEP III- Construction Engineering Services	
² Construction Phase Engineering	\$200,000
STEP III- Construction Engineering Subtotal	\$200,000
Other Costs	
³ Administrative (Force Account)	\$32,775
⁴ Administrative (other)	\$5,000
Land Acquisition / Current Use / Easements	\$30,000
Permitting Fees	\$3,055
⁵ Income Survey	\$15,000
Easement Assistance	\$10,000
⁶ Legal & Fiscal	\$23,008
Short Term Interest (0.05% of SRF eligible engineering + construction costs)	\$11,680
Other Costs Subtotal	\$130,518
SUBTOTAL	\$2,845,308
USE	\$2,846,000

Notes

- 1 - Allowance for additional Archeological Study based on preliminary layout
- 2 - Construction Engineering based on State Fee Curve
- 3 - Compensation for Westford Employee (Project Manager) Est. @ (\$34.50/hour) * (950 hours) = \$32,775
Step II = (371 hours) * (\$34.50) = \$12,799.50 Step III = (579 hours)* (\$34.50) = \$19,975.50
- 4- Administrative services including printing, mailing and general administrative duties
- 5 - GME has not received a quote for the income survey. Estimated @ 15k
- 6 - Legal and fiscal estimated at 1% of construction costs

Town of Westford
Westford Community Wastewater Disposal System
Opinion of Probable First Year Operation & Maintenance Costs - Alternative #5

Cost Category	O&M Cost
Contract Operations	\$23,000
Electrical/Internet/Telecom	\$5,000
Septage Pumping	\$2,500
Annual Engineering Inspection (includes operator inspection of STEP tanks)	\$4,500
IDP Inspection & Report	\$2,500
IDP Operating Fee	\$872
Capital Replacement	\$1,500
Insurance	\$500
Misc. Repairs	\$2,000
Billing	\$500
O&M Cost Total	\$42,872

Notes: The estimate is based on PRELIMINARY phase estimates for O&M Costs. The estimate is based on scenario's developed by Green Mountain Engineering (GME). GME bears no responsibility for prices and quantities noted in the estimate, beyond the preliminary phase. The costs will likely vary based on the actual design, site conditions. Contract Operations is based on \$55/hour x 420 hr/yr. Electrical is based on \$0.17/kw-hr. Each homeowner pays for their own STEP system electrical cost. Septage pumping is based on 1/4 systems pumped each year at a cost of \$300/pump out.