

GREEN MOUNTAIN ENGINEERING, INC.

1438 South Brownell Road

P.O. Box 159

Williston, VT 05495

(802) 862-5590

July 11, 2019

Ms. Melissa Manka, Planning Coordinator via email
 Town of Westford
 1713 Route 128
 Westford, VT 05494

RE: Updated Report – Revision 2
 Jackson Farm Wastewater Capacity Study
 GME Project No. 28-006

Dear Melissa;

As discussed, GME has revised the information presented previously based on our meeting with the Planning Commission on June 17, 2019.

Table 1, below summarizes the number of equivalent users for the project.

Table 1
 Wastewater Initial Year Flow Projection Summary

Street	Use & Flow Rate	Initial Year Flow (gpd)	Equivalent Users
Brookside Road	White Church = 236 gpd 4 SFR x 245 gpd/SFR = 980 gpd	1,216	5
Cambridge Road	1 SFR x 245 gpd/SFR = 245 gpd	245	1
Common Road	3 SFR x 245 gpd/SFR = 735 gpd Store = 90 gpd Restaurant (30 seats) 27 gpd/seat x 30 seats = 810 2 Apt. x 245 gpd/Apt. = 490 gpd	2125	9
VT Route 128	9 SFR x 245 gpd/SFR = 2,205 gpd 8 Apt. x 245 gpd/Apt. = 1,960 gpd Town Office & Library 15 gpd/employee x 10 = 150 gpd 4 gpd/seat x 140 patrons = 560 gpd Brick Meeting House 14 gpd/seat x 115 seats = 1,610 gpd	6485	27
Initial Year Total		10,071	42

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Of these initial connections, it is anticipated that the community space available in the White Church, the Town Office and Library and the Brick Meeting House would benefit the entire Town and not private interests. For this reason, the Town may wish to consider allocating a portion of the project costs related to providing septic capacity to these building to the entire Town via a parcel assessment or property value based assessment.

Based on Table 1, the flows associated with these buildings and uses represents 2,556 of the total 10,071 initial year flows or, approximately 25% of the initial flows.

<u>Use</u>	<u>Flow (gpd)</u>
White Church	236
Town Office & Library	710
Brick Meeting House	<u>1,610</u>
Total	2,556

In addition, and as discussed at the meeting, we have further considered phasing of the project and determined that the project costs are too high to try to break down into phases. As a result, we have also updated the Opinions of Probable Cost Tables (Appendix B) and a new set of tables are attached to this letter for your use. It is noted that the levels of grant funding shown in the estimates of user fees, are not specific to any single grant program and could come from a variety of sources.

Please do not hesitate to contact me if you have any questions.

Sincerely,
GREEN MOUNTAIN ENGINEERING, INC.



Alan Huizenga, P.E.,
President

Cc (via E-mail): Amy Macrellis, Stone Environmental

APPENDIX B (REVISED) – OPINIONS OF PROBABLE COST

Town of Westford
Jackson Farm Wastewater Capacity Study
Wastewater Disposal System
Opinion of Probable Construction Cost (Revised 6-17-19)

DESCRIPTION	Unit	Quantity	Unit Price	Total Amount ENR 11,183	Total Amount ENR 11,349	Total Amount ENR 12,416
Mobilization/Demobilization	LS	1	\$3,000	\$3,000	\$3,045	\$3,331
Silt Fence	LF	600	\$3	\$1,800	\$1,827	\$1,998
Excavate Leachfield Trenches	CY	2,333	\$8	\$18,667	\$18,944	\$20,725
Leachfield Stone	CY	1,383	\$25	\$34,568	\$35,081	\$38,379
1 1/2" Laterals	LF	7,000	\$6	\$42,000	\$42,623	\$46,631
Filter Fabric	SY	3,111	\$2	\$6,222	\$6,315	\$6,908
Topsoil	CY	86	\$25	\$2,160	\$2,193	\$2,399
3" Forcemains	LF	2,000	\$30	\$60,000	\$60,891	\$66,615
3" Gate Valves	Ea	3	\$800	\$2,400	\$2,436	\$2,665
6' x 12' Precast Valve Structure						
Excavation	CY	80	\$8	\$640	\$650	\$711
Precast Structure	LS	1	\$8,000	\$8,000	\$8,119	\$8,882
Hatch	LS	1	\$3,000	\$3,000	\$3,045	\$3,331
Steps	LS	1	\$600	\$600	\$609	\$666
Sump Pump	LS	1	\$500	\$500	\$507	\$555
3" Gate Valves	EA	6	\$400	\$2,400	\$2,436	\$2,665
3" Check Valves	Ea	3	\$400	\$1,200	\$1,218	\$1,332
3" SCh 80 PVC Pipe	LF	24	\$40	\$960	\$974	\$1,066
Vent Pipe	LS	1	\$300	\$300	\$304	\$333
Misc. Items	LS	1	\$1,500	\$1,500	\$1,522	\$1,665
Structural Backfill	CY	50	\$25	\$1,250	\$1,269	\$1,388
6' x 12' Precast Dosing Tank						
Excavation	CY	80	\$8	\$640	\$650	\$711
Precast Structure	LS	1	\$8,000	\$8,000	\$8,119	\$8,882
Hatches	LS	1	\$9,000	\$9,000	\$9,134	\$9,992
Pumps and Slide Rails	EA	6	\$5,000	\$30,000	\$30,445	\$33,308
3" SCh 80 PVC Pipe	LF	24	\$40	\$960	\$974	\$1,066
Vent Pipe	LS	1	\$300	\$300	\$304	\$333
Misc. Items	LS	1	\$1,500	\$1,500	\$1,522	\$1,665
Structural Backfill	CY	50	\$25	\$1,250	\$1,269	\$1,388
Electrical (New Service, Panel., Wiring)	LS	1	\$30,000	\$30,000	\$30,445	\$33,308
Temporary Road						
Excavation	CY	444	\$8	\$3,556	\$3,608	\$3,948
Filter Fabric	SY	1,333	\$2	\$2,667	\$2,706	\$2,961
Gravel	CY	444	\$25	\$11,111	\$11,276	\$12,336
Fine Grade, Seed and Mulch	SY	17,778	\$2	\$35,556	\$36,083	\$39,476
Start-Up/Testing	LS	1	\$3,000	\$3,000	\$3,045	\$3,331
Preparation of Site and Miscellaneous Work (8%)	LS	1	\$26,296	\$26,296	\$26,687	\$29,196
Bonds (1.5%)	LS	1	\$5,325	\$5,325	\$5,404	\$5,912
Contingency (10%)	LS	1	\$36,033	\$36,033	\$36,568	\$40,006
SUBTOTAL				\$396,360	\$402,244	\$440,062
USE				\$400,000	\$405,000	\$440,000

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. ENR = Engineering News Record- Construction Cost Index. ENR 11,183= October 2018. ENR 11,349= Predicted February 2020 Bid Date. ENR 12,416= Predicted February 2024 Bid Date.

Town of Westford
Jackson Farm Wastewater Capacity Study
Septic Tank Effluent Pumping (STEP) Collection System
Opinion of Probable Construction Cost - (Revised 6-17-19)

DESCRIPTION	Unit	Quantity	Unit Price	Total Amount ENR 11,183	Total Amount ENR 11,349	Total Amount ENR 12,416
A- Sewers						
A-1 2" HDPE LPS	LF	4,600	\$40	\$205,009	\$208,052	\$227,612
B- Sewerline Appurtenances						
B-1 5' Diameter Air Release/CO Manholes	EA	4	\$8,000	\$35,654	\$36,183	\$39,585
B-2 5' Dia, C.O. Manholes	EA	4	\$7,500	\$33,425	\$33,921	\$37,111
B-3 1 1/4" Low Pressure Sewer Services	LF	3,300	\$34	\$125,011	\$126,866	\$138,794
B-3 4" Gravity Sewer Services	LF	500	\$38	\$21,169	\$21,484	\$23,503
C- Earthwork						
C-1 Rock Excavation	CY	400	\$120	\$53,481	\$54,274	\$59,377
C-2 Boulder Excavation	CY	50	\$100	\$5,571	\$5,654	\$6,185
C-3 Misc. Extra and Below Grade Excavation	CY	20	\$40	\$891	\$905	\$990
C-4 Excavation & Replace Unsuitable	CY	20	\$40	\$891	\$905	\$990
D- Roadwork						
D-1 Permanent Bit. Pavement Repair	SY	80	\$60	\$5,348	\$5,427	\$5,938
D-2 Permanent Gravel Road & Drive Repair	SY	800	\$50	\$44,567	\$45,229	\$49,481
E- Incidental Work						
E-1 Class B Concrete	CY	10	\$175	\$1,950	\$1,979	\$2,165
E-2 Calcium Chloride	TON	2	\$600	\$1,337	\$1,357	\$1,484
E-3 Rigid Insulation	LF	300	\$8	\$2,674	\$2,714	\$2,969
E-4 Uniform Traffic Officers	HRS	50	\$60	\$3,343	\$3,392	\$3,711
E-5 Silt Fence	LF	1,000	\$4	\$4,457	\$4,523	\$4,948
E-6 Degradable Erosion Control Blankets	SY	300	\$4	\$1,337	\$1,357	\$1,484
E-7 Temporary Stone Check Dams	EA	12	\$120	\$1,604	\$1,628	\$1,761
E-8 1,500 Gallon STEP Tanks (Includes Electrical and Panels)	EA	31	\$10,000	\$345,395	\$350,522	\$383,477
E-9 2,000 Gallon STEP Tanks (Includes Electrical and Panels)	EA	2	\$12,000	\$26,740	\$27,137	\$29,689
E-10 House Replumbs	EA	10	\$1,000	\$11,142	\$11,307	\$12,370
E-11 Septic Tank Deactivation	EA	33	\$1,000	\$36,768	\$37,314	\$40,822
F- Lump Sum Items						
Preparation of Site and Miscellaneous Work (8%)	LS	1	\$69,487	\$77,421	\$78,570	\$85,957
Bonds (1.5%)	LS	1	\$14,071	\$15,678	\$15,910	\$17,406
Contingency (10%)	LS	1	\$95,215	\$106,086	\$107,661	\$117,783
SUBTOTAL				\$1,166,949	\$1,184,271	\$1,295,612
USE				\$1,150,000	\$1,180,000	\$1,300,000

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. ENR = Engineering News Record- Construction Cost Index. ENR 11,183= October 2018. ENR 11,349= Predicted February 2020 (Bid Date) ENR 12,416 = Predicted 2024 Bid Date

**Town of Westford
Jackson Farm Wastewater Capacity Study
Opinion of Probable Total Project Cost (Revised 6-17-19)**

DESCRIPTION	Total Cost
Construction	
Wastewater Collection System ¹	\$1,180,000
Wastewater Disposal System ¹	\$405,000
Construction Subtotal	\$1,585,000
STEP I- Preliminary Engineering	
Feasibility Study	N/A
Preliminary Engineering Study (remaining tasks)	\$10,000
Act 250 Permitting	\$5,000
Indirect Discharge Permitting	\$25,000
Water Supply/Wastewater Disposal Permits	\$2,000
Archeological Phase 1 B	\$5,000
Wetlands Review	\$2,500
Environmental Assessment Report	\$5,000
Bond Vote Technical Assistance	\$2,000
Sewer Use Ordinance	\$2,000
STEP I- Preliminary Engineering Subtotal	\$58,500
STEP II- Final Design Engineering	
Final Design Allowance ²	\$109,365
STEP II- Final Design Subtotal	\$109,365
STEP III- Construction Engineering Services	
Construction Engineering ²	\$200,503
STEP III- Construction Engineering Subtotal	\$200,503
Other Costs	
Administrative	\$2,500
Land Acquisition	N/A
Easement Assistance	\$2,500
Legal & Fiscal	\$2,500
Short Term Interest	N/A
Other Costs Subtotal	\$7,500
SUBTOTAL	\$1,960,868
USE	\$1,950,000

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. ENR = Engineering News Record- Construction Cost Index. ENR 11,349= Predicted February 2020 (Bid Date)

**Town of Westford
 Jackson Farm Wastewater Capacity Study
 Opinion of Probable First Year O&M Cost (Revised 6-17-19)**

Cost Category	O&M Cost
Contract Operations	\$9,360
Electrical	\$2,500
Septage Pumping	\$2,500
Annual Engineering Inspection	\$1,000
Capital Replacement	\$1,000
Insurance	\$500
Misc. Repairs	\$1,000
Billing	\$500
O&M Cost Total	\$18,360

Notes: The estimate is based on PLANNING 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 planning phase. The costs will likely vary based on the actual design, site conditions. Contract Operations is based on \$45/hour x 208 hr/yr. Electrical is based on \$0.14/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
Jackson Farm Wastewater Capacity Study
User Fee Estimates- Users Pay 100% (Revised 6-17-19)

Category	No Grants	35% Grants	50% Grants	75% Grants
Bond Repayment Amount	\$1,950,000	\$1,267,500	\$975,000	\$487,500
Annual Bond Payment	\$119,243	\$77,508	\$59,621	\$29,811
Annual O&M costs	\$18,360	\$18,360	\$18,360	\$18,360
Total Annual Cost	\$137,603	\$95,868	\$77,981	\$48,171
No. of EU's	42	42	42	42
Annual User Fee	\$3,276	\$2,283	\$1,857	\$1,147

Notes: Annual Payment 20yr., SFRF 2% loan (\$61.16/\$1,000 borrowed)

Town of Westford
Jackson Farm Wastewater Capacity Study
User Fee Estimates- 25% Parcel Assessment (Revised 6-17-19)

Category	No Grants	35% Grants	50% Grants	75% Grants
Bond Repayment Amount	\$1,950,000	\$1,267,500	\$975,000	\$487,500
Annual Bond Payment	\$119,243	\$77,508	\$59,621	\$29,811
Flow Based (25% of total Bond)	\$29,811	\$19,377	\$14,905	\$7,453
No. of Parcels	936	936	936	936
Annual Parcel Fee	\$31.85	\$20.70	\$15.92	\$7.96
Annual O&M costs	\$18,360	\$18,360	\$18,360	\$18,360
No. of EU's	42	42	42	42
User Bond Fee (Remaining 75% of total Bond)	\$2,129.33	\$1,384.06	\$1,064.67	\$532.33
User O&M Fee	\$437	\$437	\$437	\$437
Total User Fee	\$2,598	\$1,842	\$1,518	\$977

Notes: Annual Payment 20yr., SFRF 2% loan (\$61.16/\$1,000 borrowed)

Town of Westford
Jackson Farm Wastewater Capacity Study
User Fee Estimates- 25% Property Assessment Fee (Revised 6-17-19)

Category	No Grants	35% Grants	50% Grants	75% Grants
Bond Repayment Amount	\$1,950,000	\$1,267,500	\$975,000	\$487,500
Annual Bond Payment	\$119,243	\$77,508	\$59,621	\$29,811
Flow Based (25% of total Bond)	\$29,811	\$19,377	\$14,905	\$7,453
Increase in Tax Rate Needed	\$0.012	\$0.008	\$0.006	\$0.003
Property Value Assessed Fee	\$33	\$21	\$17	\$8
Annual O&M costs	\$18,360	\$18,360	\$18,360	\$18,360
No. of EU's	42	42	42	42
User Bond Fee (Remaining 75% of total Bond)	\$2,129.33	\$1,384.06	\$1,064.67	\$532.33
User O&M Fee	\$437	\$437	\$437	\$437
Total User Fee	\$2,599	\$1,843	\$1,518	\$978

Notes: Annual Payment 20yr., SFRF 2% loan (\$61.16/\$1,000 borrowed); Property value assessed fee is that typical for a property value of \$275,000.