December 2014

Scoping Study

Emergency Access Road with West Main Street Water and Sewer Extensions for Town of Richmond, Vermont

GREEN MOUNTAIN ENGINEERING

12/31/14

UPDATED FINAL DRAFT

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SCOPING STUDY FOR EMERGENCY ACCESS ROAD WITH WEST MAIN STREET WATER AND SEWER EXTENSIONS FOR TOWN OF RICHMOND, VERMONT

December, 2014

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1.0 INTRODUCTION

The Town of Richmond hired Green Mountain Engineering, Inc. to perform a Scoping Study for a water/sewer extension in the West Main Street area of town and new emergency access drive for the Middle and Elementary school.

The proposed project includes numerous stake holders including, but not limited to:

- The Reaps (new owners of the Willis Parcel);
- The Town of Richmond;
- The Chittenden East Supervisory Union (CESU);
- The Richmond Land Trust, which is purchasing a portion of the Reap property for conservation;
- Land and business owners along West Main Street from the Reap property to the intersection of US Rte. 2 and VT Rte. 117;
- Land and business owners along VT Rte. 117 from Governor Peck Road to the Riverview Commons Mobile Home Park, and;
- Riverview Commons Mobile Home Park

This Scoping Study, culminating in this report to be reviewed and approved by the Town, outlines the scope, probable construction and total project costs and a timeline for design and construction of the project. Major components of the Scoping Study includes the immediate requirements of the Reaps as they develop their lands, requirements of the Riverview Commons Mobile Home Park (RCMHP), determining the service area expansion limits including the type and number of new service connections within the area, and agreement on the location and type of access drive to be constructed. The Final Design and Permitting work will then be based on the design parameters agreed to in the Scoping Phase.

This Scoping Study consists of the following work:

a. Coordination and Meetings with Stakeholders
b. Determine expanded Service Area.
c. Determine most likely termination points for utilities at the school/Jericho Road area.

d. Determine the Reap property development requirements and integrate with the water and sewer service expansion to West Main Street.
e. Determine the RCMHP requirements and integrate with the water and sewer service expansion to West Main Street.
f. Determine location and materials of construction for new access road.
g. Desktop analysis of existing receiving sewer capacities.
h. Update Water System Hydraulic analysis with proposed service area.
i. Provide preliminary probable construction costs for agreed project scope.
j. Develop updated time line for final design and permit phase.

2.0 STUDY AREA

2.1 Boundaries

The study area is the area defined on Figure 1 (Location Map) in Appendix A. The water and sewer project area includes three (3) phases including:

a. Phase I: Connection to existing water and sewer near the Camels Hump Middle School to Route 2 through the land trust and Reap development properties.
b. Phase II: Route 2 from the Reap Development heading west to approximately 1151 West Main St.
c. Phase III: Route 2 @ approximately 1151 West Main St. (west end of Phase II) and Route 117 to the Riverview Commons Mobile Home Park.

The project also includes an emergency access drive for the Middle and Elementary schools.

2.2 Zoning and Land Use

As shown on Figure 2 (Zoning Map) in Appendix A, the study area is located within four (4) zoning districts including:

a. Gateway Commercial District (G)
b. Commercial (C)
c. Mobile Home Park (MHP)
d. Agricultural/Residential (AR)

The Gateway Commercial District is designated to allow for commercial uses in an area that has importance as a scenic entrance to the Town of Richmond. There are various allowed and conditional uses as specified in the zoning regulations. Currently water supply and wastewater disposal in the area are both served by on-site individual systems. The zoning regulations allow for 1/3 acres lots for properties served by municipal water and sewer and 1 acre lots for those not served by municipal water and sewer.

The Commercial District also allows for 1/3 acres lots for properties served by municipal water and sewer and 1 acre lots for those not served by municipal water and sewer.

For the Mobile Home Park District, a lot which is not a mobile home park (MHP) shall not be less than 1 acre. A lot which is used for a MHP shall contain not less than 10 acres and individual lots within the park shall not be less than ¼ acre.

The Agricultural/Residential District also allows for 1 acre lots with no provision for smaller lots with community water and sewer.

Various uses are allowed in each district and reference is hereby made to the Richmond Zoning Regulations as well as the Subdivision regulations for a complete list of allowed and conditional uses.

2.3 Property Owner Interest Survey

The Town of Richmond sent out a survey/questionnaire to all property owners within the study area. At the time of this report, eight (8) surveys were returned. All eight surveys returned were in favor of the water and wastewater utility extension. In addition to the 8 survey's the RCMHP is also interested and has been added to the study as Phase III. See Appendix B for a map of the area and copies of the surveys.

3.0 NEW SCHOOL EMERGENCY ACCESS ROAD

3.1 General

The access road is intended to be an emergency egress only road which would be normally gated off. The proposed road is generally delineated Option D in the layout plan entitled "Site Plan- Alternative Access Study by Krebs and Lansing" and available for review upon request. The access road would go from Route 2 through the Reap development then along the east side of the development near the Interstate 89 property line and parallel the interstate, cross the proposed Vermont Land Trust property near Interstate 89, and enter the school property in the back northwest parking lot. The road would be gated after the Reap development and at the school parking lot. The location of the road is shown on Figure No. 3 in Appendix A. The Reaps would be responsible for building the road from Route 2 through their proposed development to a point approximately at the bend in the road near the back lot with Interstate 89. The school would be responsible from this point to the middle school. The road would be a gravel road with a total roadway width of 20 feet (16' travel way with 2' shoulders). There would be a significant amount of fill required to construct the road. For the purpose of this study, a maximum grade of 12% was assumed. Increasing this value would result in less fill required.

4.0 EXISTING WATER SYSTEM ANALYSIS

4.1 General

An evaluation of the capacity of the Town of Richmond water system to supply water to the proposed study area was conducted. The following information is evaluated in this section:

- Water System Reserve Capacity
- Existing and Proposed Water System Demands
- Water System Hydraulic Analysis

An 8" PVC water line extension from the existing 8" water line at the middle school was assumed. Eight inch is the minimum size line in order to provide a hydrant with fire flow per the State of Vermont, Water Supply Rules. In order to provide minimum fire protection to the upper (north) level of the RCMHP the line must be upsized to 10" Diameter for the final 3600 feet of waterline to the MHP.

4.2 Water System Reserve Capacity

The reserve capacity of the water system is calculated by present average daily flow and the committed allocations for water connections from the water system average daily flow capacity. The present average daily flow is 80,000 gpd. Table 1 summarizes the committed allocations for water services which have not yet been connected. This information was obtained from the Town officials.

Table 1
Unconnected Committed
Water Allocated Flows - 2014

Applicant	Unconnected Committed Water Allocated Flows (gpd)
Creamery (32 accts x 450 gpd)	14,400
Four Residences (4 accts x 450 gpd)	1,800
Total Unconnected Committed Water Allocations	16,200

Table 2 summarizes the water system capacity.

Table 2
Estimated Water Capacity Analysis - 2014

Description	Capacity/Flow
New Potable Water Reservoir Capacity	760,000 Gal
- Present Average Daily Flow	80,000 gpd
- Unconnected Committed Water Allocated Flows	16,200 gpd
Net New Water Reservoir Capacity (including fire protection)	**663,800**

4.3 Existing and Future Water System Demands

Water flow projections were developed using the average flow numbers for the Richmond Village Area. Water flow demands for residential and apartment units were developed based on an average daily demand flow of 100 gpd per residential unit. For this study, it is assumed that each residence averages three (3) bedrooms. Water demand flow projections for businesses and other non-residential properties were developed using Table A2-1 of the Water Supply Rules. Table 3 (following page) provides a summary of the water system average demands for the existing Study Area properties.

Table 3
Estimated Study Area Water and Wastewater Existing Flow Demand

Phase/ Address	Use Description	User Type	Quantity	Flow* Basis	Ave. Daily Flow (gpd)
Phase 1					
840 W Main	Commercial	Reap Office Building/ Employees	42	15 gpd/staff	630
Subtotal Phase 1					**630**
Phase 2					
878 W Main	Residential	Single Family Home	1	100 gpd/Unit	100
920 W Main	Res./Commercial	Single Family Home/Tow Business	1	100 gpd/Unit	100
932 W Main	Residential	Single Family Home/Home Business	1	100 gpd/Unit	100
978 W Main	Residential	Single Family Home	1	100 gpd/Unit	100
1010-1014 W Main	Residential	Duplex	2	100 gpd/Unit	200
1008-1012 W Main	Residential	Duplex	2	210 gpd/Unit	200
1070 W Main	Commercial	Office Bldg/Employees	20	15 gpd/staff	300
1108 W Main	Commercial	Dog Day Care Employees Kennels Grooming Station	 8 40 1	 15 gpd/staff 25 gpd/kennel 400 gpd/station	 120 1,000 400
1151 W Main	Res./Commercial	Residence Chiropractor Office	1 3 16	100 gpd/Unit 35 gpd/staff 10 gpd/patient	100 105 160
-	Vacant	Hay barn	-	-	-
-	Vacant	Field South Side	-	-	-
-	Vacant	Empty Lot	-	-	-
Subtotal Phase 2					**2,985**
Subtotal Phase 1 and 2					**3,615**
Phase 3					
1436 W Main	Commercial Gas Station	1st Pump Set Additional Pump Sets Employees	1 3 6	500 gpd/Pump 300 gpd/Pump 15 gpd/staff	500 900 90
9 Gov. Peck	Commercial-Fuel	Employees	8	15 gpd/staff	120
116 River Rd	Commercial - Fuel	Employees	10	15 gpd/staff	150
Rte. 117	Mobile Home Park	Mobile Homes	148	142 gpd/MH	21,016
Subtotal Phase 3					**22,626**
Subtotal Phase 1, 2 and 3					**26,241**

***Based on estimates, State "book flows" or existing State Permits except for Mobile Home Park which is metered**

Future water system demands were estimated based on existing demand, together with projected development and build out. Table 4 provides a summary of the future estimated Study Area water system average demands.

Table 4

Estimated Study Area Water System Future Flows

Phase/ Address	Use Description	User Type	Quantity**	Flow* Basis	Average Daily Flow (gpd)
Phase 1					
840 W Main				Existing Flow	630
		New Office Building	51	15 gpd/employee	765
		Preschool/Day Care	30	15 gpd/staff & Child	450
		Barn Conversion	1	Estimated Set Aside	800
				Subtotal Phase 1	**2,645**
Phase 2					
				Existing Flow	2985
878 W Main	Res./Commercial	Residential Commercial	2 2	100 gpd/Unit 300 gpd/Unit	200 600
920 W Main	Res./Commercial	Residential Commercial	2 2	100 gpd/Unit 300 gpd/Unit	200 600
932 W Main	Res./Commercial	Residential Commercial	3 3	100 gpd/Unit 300 gpd/Unit	300 900
978 W Main	Res./Commercial	Residential Commercial	2 2	100 gpd/Unit 300 gpd/Unit	200 600
1010-1014 W Main	Res./Commercial	Residential Commercial	2 2	100 gpd/Unit 300 gpd/Unit	200 600
1008-1012 W Main	Res./Commercial	Residential Commercial	2 2	100 gpd/Unit 300 gpd/Unit	200 600
1070 W Main	Res./Commercial	Residential Commercial	2 2	100gpd/Unit 300 gpd/Unit	200 600
1108 W Main	Res./Commercial	Residential Commercial	1 1	100 gpd/Unit 300 gpd/Unit	100 300
1151 W Main	Res./Commercial	Residential Commercial	1 1	100 gpd/Unit 300 gpd/Unit	100 300
-	Vacant- Residential	Hay barn- Residential	1	100 gpd/Unit	100
-	Vacant- Residential	Field South Side- Residential	1	100 gpd/Unit	100
-	Vacant- Comm/Res	Empty Lot Residential Commercial	 2 2	 100 gpd/Unit 300 gpd/Unit	 200 600
				Subtotal Phase 2	**10,685**
				Subtotal Phase 1 and 2	**13,330**
Phase 3					
				Existing Flow	22,626
Rt 117	Mobile Home Park	Mobile Home	100	142 gpd/MH	14,200
				Subtotal Phase 3	**36,826**
				Subtotal Phase 1, 2 and 3	**50,156**

***Based on average Richmond Village flows for Residential and State of VT "book flows" for 20 employees per commercial unit (15gpd x 20 = 300 gpd).**

**** Approx. "Build out" based on allowable lots and Res./Commercial mix for each district.**

Table 5

Estimated Future Water Reservoir Capacity Analysis

Description	Existing**	Estimated Full Build-Out***
Available* Reservoir Capacity (including fire protection)	663,800	663,800
Phase 1 Flows	630	2,645
Remaining Capacity (including fire protection)	663,170	661,155
Phase 2 Flows	2,985	10,685
Remaining Capacity (including fire protection)	660,185	650,470
Phase 3 Flows	22,626	36,826
Remaining Capacity (including fire protection)	637,559	613,644

***See Table 2 **See Table 3 ***See Table 4**

4.4 Water System Hydraulic Analysis

A hydraulic analysis of the Town of Richmond's water system was conducted using HydroCad® to evaluate the adequacy of the system including a water line extension for West Main Street. For the purpose of this report, a 7,900' extension with hydrants located at the Reap property, the high point of the line near the Crate Escape, the mobile home park entrance and the upper level of the mobile home park was analyzed. The analysis was performed to determine the system pressures for both average use and for different fire flow situations. Analysis was performed assuming the new reservoir, planned for construction in 2015, is in service.

Table 6 provides a summary of the water system hydraulic analysis. The State of Vermont, Water Supply Rules require a minimum pressure of 20 psi under all conditions of flow. The Town has a maximum pressure requirement of 100 psi before installing a pressure reducing valve. As shown in Table 6, the new 8" and 10" water lines meet the pressure requirements. The new reservoir would need to be in operation before installing any hydrants west of the Reap property.

Table 6
Summary of Water System Hydraulic Analysis with New Reservoir

Condition	Pressure At Reap Hydrant (psi)	Pressure At Crate Escape Hydrant (psi)	Pressure At RCMHP Hydrant @ Rte. 117 (psi)	Pressure At Upper RCMHP Hydrant (psi)
50 yr. Max Day Demand	92.1	90.3	99.8	72.1
1,500 gpm Fire Flow@ Reap	52.0	50.3	59.7	52.1
1,000 gpm Fire Flow@Crate Escape	72.6	60.4	69.8	42.1
1,000 gpm Fire Flow@ RCMHP/117	72.6	60.4	52.0	24.3
500 gpm Fire Flow@Upper RCMHP	86.2	81.3	82.0	50.9

5.0 EXISTING SEWER SYSTEM ANALYSIS

5.1 WWTF Uncommitted Reserve Capacity

The uncommitted reserve capacity of the Wastewater Treatment Facility (WWTF) is calculated by subtracting both the 12-month annual average daily flow and the committed allocations for sewer connections from the permitted capacity. The WWTF permitted capacity is 222,000 gallons per day (gpd). The 12- month annual average daily flow from August 2013 through July 2014 is 70,167 gpd as summarized in Table 7. This is calculated based on the monthly average flows as reported on the WWTF WR-43 monthly reports.

Table 7
WWTF 12-Month Annual Average Daily Flow

Month/Year	Average Daily Flow (gpd)
August 2013	65,000
September 2013	67,000
October 2013	61,000
November 2013	59,000
December 2013	61,000
January 2014	72,000
February 2014	61,000
March 2014	71,000
April 2014	97,000
May 2014	77,000
June 2014	78,000
July 2014	73,000
12-MonthAve.	**70,167**

Table 8 summarizes the committed allocations for sewer connections which have not yet been connected. This information was obtained from the Town officials.

Table 8
Estimated Unconnected Committed
Sewer Allocated Flows

Applicant	Unconnected Committed Sewer Allocated Flows (gpd)
Creamery (32 accts x 210 gpd)	6,720
Four Residences (4 accts x 210 gpd)	840
Total Unconnected Committed Sewer Allocations	7,560

Table 9 summarizes the WWTF uncommitted sewer capacity allocation.

Table 9
Estimated Sewer Uncommitted Reserve Capacity

Description	Flow (gpd)
WWTF Permitted Capacity	222,000
80% of WWTF Permitted Capacity	176,000
- 12-Month Annual Average Daily Flow	70,167
- Unconnected Committed Sewer Allocated Flows	7,560
= WWTF Uncommitted Reserve Capacity	**98,273**

5.2 Existing and Future Wastewater Flows

Wastewater flow projections were developed using the local average daily flows for the Richmond Village area and the State of Vermont, Environmental Protection Rules (EPR), Chapter 1, dated September 29, 2007. Flow demands for residential and apartment units were developed based on the number of living units. A living unit is defined as a single family home, apartment, or mobile home. A design flow of 100 gpd per living unit is used for wastewater without regard to the number of bedrooms. Wastewater flow projections for businesses and other non-residential properties were developed using Table 2 of the Rules. Sewer line infiltration was estimated for gravity sewer lines using 300 gal/in. pipe/dia/mile/day, as required by the rules. Infiltration is not accounted for in pressure pipes force mains and grinder low pressure sewers.

Table 3 provides a summary of the water and wastewater system average demands for the existing properties and uses. Table 4 provides a summary of the water and wastewater system average demands for the future development of the properties which are based on the proposed densities allowed for each zoning district where municipal water and sewer is available.

Table 10 outlines the available sewage treatment capacity in the existing WWTF and is based on Table 9.

Table 10
Estimated Wastewater Capacity Analysis

Description	Existing**	Estimated Full Build-Out***
Available Capacity*	98,273	98,273
Phase 1 Flows	630	2,645
Remaining Capacity	97,643	95,628
% Remaining of Available Capacity	99%	97%
Phase 2 Flows	3,975	13,875
Remaining Capacity	93,668	81,753
% Remaining of Available Capacity	95%	83%
Phase 3 Flows	25,760	41,760
Remaining Capacity	67,908	39,933
% Remaining of Available Capacity	69%	41%

***See Table 9** ****See Table 3** *****See Table 4**

5.3 Middle School Wastewater Pump Station and Forcemain

Two alternatives were considered for wastewater collection and transmission to the existing gravity sewer system. One alternative evaluated was to pump the wastewater from West Main Street to the middle school wastewater pump station located in the northwestern corner of the school, which in turn pumps wastewater through an existing forcemain to the "B" line gravity sewer on Jericho Road. The middle school wastewater pump station consists of a 4 ft diameter wet well, and a steel dry well consisting of two (2) 500 gpm vertical centrifugal pumps and valves. The forcemain is a 4" cast iron and runs along the roadway on the northern side of the school. Although the pumps are adequate for the school and wastewater flow from the West Main Street sewer extension, the school's 4 ft diameter wet well is under sized for its current use. There is not enough storage capacity to meet the required 4 hours of storage in the event of a power outage. The wet well would need to be expanded to accommodate operating capacity and storage. This upgrade would result in increased project costs, therefore, it was determined that connecting to the school's pump station is not viable.

A second alternative was a connection to the school's existing forcemain utilizing a valve structure and a solids handling pump station and forcemain from below, on West Main Street. This would save a significant amount of forcemain pipe in order to run to the Jericho Road gravity sewer. It was determined that utilization of grinder pumps from this location was not feasible because of the size of the pumps needed to maintain a minimum of 3 feet per second velocity in the forcemain.

5.4 Existing Gravity Sewer System Capacity

The capacity of the Town of Richmond's gravity sewer from the manhole on Jericho Road along the "B" line sewer to the Wastewater Treatment Facility was also evaluated for this project. The gravity sewer was evaluated manhole to manhole using the as-built drawings prepared by Webster-Martin, Inc. dated 1971. A program named FlowMaster® was used to evaluate the full flow capacity of the gravity sewers. The pipe diameter, pipe type, and slope were entered into the program for each segment of pipe. Based on the inputs, the program calculated the full flow capacity in millions of gallons per day. The program uses several factors to calculate full flow capacity including roughness of the pipe, geometric configuration (cross-section and length), and slope. The Continuity Equation and the

Manning Equation for steady-state flow are used by the program to calculate the flow in a sewer pipe:

Continuity Equation: $Q = V \times A$

Where:

Q = peak flow, cubic feet per second (cfs).

V = velocity, feet per second (fps).

A = cross-sectional area of pipe, square feet (sf).

Manning Equation: $V = (1.486 \times R2/3 \times S1/2)/n$

Where:

V = velocity, fps.

n = Manning's coefficient of friction.

R = hydraulic radius (area divided by wetted perimeter), feet.

S = slope of pipe, feet per foot.

Table 11 provides a summary of the full flow capacity of the existing gravity sewer lines. As shown on Table 11, the gravity sewer lines have significant capacity available above the treatment plant capacity.

Table 11

Existing Gravity Sewer System Capacity

Pipeline Segment	Diameter (in.)	Type	Slope (ft/ft)	Segment Full Flow Capacity (MGD)
32A - 32	8	AC	0.0040	0.584
32 - 31	8	AC	0.0040	0.584
31 - 30	8	AC	0.0563	2.190
30 - 29	8	AC	0.0043	0.605
29 - 28	8	AC	0.0040	0.584
28 - 27	8	AC	0.0040	0.584
27 - 26	8	AC	0.0103	0.937
26 - 25	8	AC	0.0040	0.584
25 - 24	8	AC	0.0152	1.138
24 - 23	8	AC	0.1551	2,744
23 - 22	8	AC	0.0040	0.584
22 - 21	8	AC	0.2308	4.434
21 - 20	8	AC	0.0580	2.223
20 – 19A	8	AC	0.0040	0.584
19A - 19	8	AC	0.0040	0.584
19 - 18	8	AC	0.0040	0.584
18 - 17	8	AC	0.0040	0.584
17 - 16	8	AC	0.0040	0.584
16 - 15	8	AC	0.0124	1.028
15 - 13	8	AC	0.0277	1.536
13 - 12	10	AC	0.0021	0.767
12 - 11	10	AC	0.0028	0.886
11 - 10	10	AC	0.0280	2.800
10 - 9	10	AC	0.0097	1.648
9 - 8	10	AC	0.0239	1.420
8 - 7	10	AC	0.0072	1.420
7 - 2	10	AC	0.0022	0.785
2 - 1	12	AC	0.0022	1.276

MGD= Million Gallons per Day

5.5 Sewer line Extension Alternatives

Two (2) sewerline extension alternatives were evaluated including:

- **Alternative No. 1: 3" force main and grinder pumping system from RCMHP to #1151 West Main with 8" gravity sewer along Route 2 with a municipal pump station near the reap property**. The pump station would then pump the sewage through a 4" forcemain and connect into the middle School forcemain which connects to the gravity sewer on Jericho Road.

- **Alternative No. 2: A 3" grinder pump low pressure sewer along route 2 from RCMHP to Jericho Road**. The RCMHP and each building owner would be responsible for providing a grinder pump station and connection to the low pressure sewer main. The property owners would also be responsible for their own electrical costs. After evaluating the forcemain connection, it was determined that the grinder pump forcemain should not be connected to the school's 4" forcemain. A 3" forcemain is typically the largest diameter for grinder pump system without needing significant horsepower pumps in order to maintain scouring velocities. Three alternatives for connection were evaluated including running a parallel forcemain to Jericho Road, upgrading the school's pump station with an expanded wet well and emergency storage, and upgrading the school's pump station with an expanded wet well and an emergency generator. The costs for each alternative are provided in Table 13. It is anticipated that 5hp pumps and single phase electrical service would be adequate for most connections but each proposed installation would need to be evaluated separately.

Table 13
Grinder Pump Connection Alternatives
Opinion of Probable Construction Cost

Alternative	Construction Cost ENR 9750 2014
Connection to Expanded School Wet Well & Emergency Storage	**$66,000**
Connection to Expanded School Wet Well & Emergency Generator	**$80,000**
Parallel 3" Low Pressure Sewer	**$66,000**

Because the costs of the parallel low pressure sewer and expanded school wet well and emergency storage were the lowest, either of these alternatives could be chosen. Expanding the wet well and emergency storage at the school will also help alleviate the undersized wet well problem at the middle school. Connecting to the middle school pump station would increase O&M costs for the School District, especially electrical costs. The parallel sewer would decrease electrical costs for the users and may prevent odors at the school.

6.0 OPINION OF PROBABLE COSTS

6.1 Opinion of Probable Construction Cost

Opinions of probable construction costs were developed for the access road, water extension and wastewater alternatives. Prior to development of the construction cost estimates, quantity take-offs were completed to establish unit quantities for projected project unit price bid items. Construction costs were generated using unit price bids on recent construction projects in the area. The construction costs are based on the assumption that work will be performed by an independent general contractor. The construction costs also include a 10% contingency.

Detailed opinion of probable construction costs for each project item is provided in Appendix C. Because it is not known when each of these projects will occur, current and future projected construction cost estimates were developed using the Engineering News Record (ENR) Construction Cost Index (CCI). Current 2014 construction cost estimates (ENR 9750) were developed by adjusting the unit price items from similar jobs to today's dollars using a ratio of ENR values. Estimates for future ENR values were developed by graphing the last ten (10) years of ENR values and projecting a best fit line into the future and estimating the future ENR values. Construction cost estimates were then projected out for the next three (3) years to 2015, 2016 and 2017.

Table 14 (following page) provides a summary of the opinion of probable construction costs for the years 2014 (ENR 9750), 2015 (ENR 9800), 2016 (ENR 10000), and 2017 (ENR 10200).

Table 14
Opinion of Probable Construction Cost

Project	Opinion of Probable Construction Cost			
	ENR 9750 2014	ENR 9800 2015	ENR 10000 2016	ENR 10200 2017
School Emergency Access Road	**$1,083,000**	**$1,089,000**	**$1,111,000**	**$1,133,000**
8" Waterline Extension				
PH1- School to West Main Street (Reap Property)	$223,000	$224,000	$229,000	$234,000
PH2- Reap Property to Chiropractor Office	$289,000	$290,000	$296,000	$302,000
Subtotal	**$512,000**	**$514,000**	**$525,000**	**$536,000**
PH3- Chiropractor Office to Mobile Home Park	$709,000	$713,000	$727,000	$742,000
Total	**$1,221,000**	**$1,227,000**	**$1,252,000**	**$1,278,000**
Sewer Extension Alternatives				
Alterative No. 1				
Gravity Sewer/Pump Station/Forcemain				
PH1- Sewer Pump Station & 4" Forcemain Reap Property to School	$379,000	$381,000	$389,000	$396,000
PH2- 8" Gravity Sewer- Reap Property to Chiropractor Office	$195,000	$196,000	$200,000	$204,000
Subtotal	**$574,000**	**$577,000**	**$589,000**	**$600,000**
PH3- Chiropractor Office to Mobile Home Park (Grinder System)	$524,000	$527,000	$537,000	$548,000
Total	**$1,098,000**	**$1,104,000**	**$1,126,000**	**$1,148,000**
Alternative No. 2				
3" Low Pressure Sewer Grinder Pump Forcemain				
PH1- Reap Property to School	$170,000	$171,000	$174,000	$178,000
PH2- Reap Property to Chiropractor Office	$139,000	$140,000	$143,000	$146,000
Subtotal	**$309,000**	**$311,000**	**$317,000**	**$324,000**
PH3- Chiropractor Office to Mobile Home Park	$524,000	$527,000	$537,000	$548,000
Total	**$833,000**	**$838,000**	**$854,000**	**$872,000**

6.2 Opinion of Probable Total Project Cost

Total project costs include construction, final design, and construction engineering costs. Table 15 (following page) provides a summary of the total project cost estimates for the 2014 (ENR 9750), 2015 (ENR 9800), 2016 (ENR 10000), and 2017 (ENR 10200). Final design and construction engineering service cost estimates are based on the State of Vermont, Facility Engineering Division, Engineering Services Curve formulas. These costs do not include land acquisition, advertisement or legal fees.

Table 15
Opinion of Probable Total Project Cost Summary

Project	Construction Cost Estimate ENR 9750 2014	ENR 9800 2015	ENR10000 2016	ENR10200 2017
School Emergency Access Road				
Construction	$1,083,000	$1,089,000	$1,111,000	$1,133,000
Final Design	$73,000	$74,000	$75,000	$76,000
Construction Engineering	$134,000	$135,000	$136,000	$137,000
Total	**$1,290,000**	**$1,298,000**	**$1,322,000**	**$1,346,000**
Waterline Extension				
Ph1: School to 840 West Main Street (Reap Property)				
Preliminary Engineering	$10,000	$10,000	$10,000	$10,000
Construction	$223,000	$224,000	$229,000	$234,000
Final Design	$15,000	$15,000	$16,000	$16,000
Construction Engineering	$28,000	$28,000	$29,000	$29,000
Phase 1 Subtotal	**$276,000**	**$277,000**	**$284,000**	**$289,000**
Ph2: 840 West Main (Reap Property) to 920 West Main - Chiropractor Office				
Construction	$289,000	$290,000	$296,000	$302,000
Final Design	$22,000	$22,000	$23,000	$23,000
Construction Engineering	$40,000	$40,000	$41,000	$41,000
Phase 2 Subtotal	**$351,000**	**$352,000**	**$360,000**	**$366,000**
Phase 1 and 2 Total	**$627,000**	**$629,000**	**$644,000**	**$655,000**
Ph3: 920 West Main - Chiropractor Office to Mobile Home Park				
Construction	$709,000	$713,000	$727,000	$742,000
Final Design	$48,000	$48,000	$49,000	$50,000
Construction Engineering	$88,000	$89,000	$91,000	$92,000
Phase 3 Subtotal	**$845,000**	**$850,000**	**$867,000**	**$884,000**
Phase 1, 2 and 3 Total	**$1,472,000**	**$1,479,000**	**$1,511,000**	**$1,539,000**
Sewer Extension Alternatives				
Alternative No. 2: 3" Sewer Grinder Pump Force main				
Ph1: School to 840 West Main Street (Reap Property)				
Preliminary Engineering	$10,000		$10,000	$10,000
Construction	$170,000		$174,000	$178,000
Final Design	$14,000		$14,000	$14,000
Construction Engineering	$25,000		$25,000	$26,000
Phase 1 Subtotal	**$219,000**		**$223,000**	**$228,000**
Ph2: 840 West Main (Reap Property) to 920 West Main - Chiropractor Office				
Construction	$139,000		$143,000	$146,000
Final Design	$12,000		$12,000	$12,000
Construction Engineering	$21,000		$22,000	$22,000
Phase 2 Subtotal	**$172,000**		**$177,000**	**$180,000**
Phase 1 and 2 Total	**$391,000**		**$400,000**	**$408,000**
Ph3: 920 West Main - Chiropractor Office to Mobile Home Park				
Construction	$524,000		$537,000	$548,000
Final Design	$38,000		$39,000	$40,000
Construction Engineering	$70,000		$72,000	$73,000
Subtotal	**$632,000**		**$648,000**	**$661,000**
Phase 1, 2 and 3 Total	**$1,023,000**		**$1,048,000**	**$1,069,000**

6.3 Revenue Analysis for Existing Use

Tables 16 and 17 provide estimates of projected Hook-on Fees for water and sewer service for existing structures and uses in the Study area. Table 18 and 19 provide estimates of the expected revenue to be generated by user fees for Water and Sewer service for existing structures and uses in the Study area. The Hook on Fees are based on the Town of Richmond Sewer and Water Ordinance and rates and are calculated based on State of Vermont "book" flows. The Revenue is based on the flows outlined in Table 3 of this report, which are much less than that utilized for the hook-on fees. Tables 16 through 19 are presented on the following pages.

Table 16
Estimated Study Area Water System Hook-On Fees

Phase/ Address	Use Description	User Type	Quantity	Flow For Fee Basis*	Ave. Daily Flow (gpd)	Hook-On Fee*
Phase 1						
840 W Main	Commercial	Reap Office Building/ Employees	42	15 gpd/staff	630	$1,341
Subtotal Phase 1					**630**	**$1,341**
Phase 2						
878 W Main	Residential	Single Family Home	1	450 gpd/Unit	450	$1,001
920 W Main	Res./Commercial	Single Family Home/Tow Business	1	450 gpd/Unit	450	$1,001
932 W Main	Res./Commercial	Single Family Home/ Home Business	1	450 gpd/Unit	450	$1,001
978 W Main	Residential	Single Family Home	1	450 gpd/Unit	450	$1,001
1010-1014 W Main	Residential	Duplex	2	450 gpd/Unit	900	$1,851
1008-1012 W Main	Residential	Duplex	2	450 gpd/Unit	900	$1,851
1070 W Main	Commercial	Office Building/Employees	20	15 gpd/staff	300	$717
1108 W Main	Commercial	Dog Day Care Employees Kennels Grooming Station	8 40 1	15 gpd/staff 25 gpd/kennel 400 gpd/station	120 1,000 400	$3,023
920 W Main	Res./Commercial	Residence Chiropractor Office	1 3 16	450 gpd/Unit 35 gpd/staff 10 gpd/patient	450 105 160	$1,501
-	Vacant	Hay barn	-	-	-	
-	Vacant	Field South Side	-	-	-	
-	Vacant	Empty Lot	-	-	-	
Subtotal Phase 2					**6,135**	**$12,947**
Subtotal Phase 1 and 2					**6,765**	**$14,288**
Phase 3						
1436 W Main	Commercial - Gas Station	1st Pump Set Additional Pump Sets Employees	1 3 6	500 gpd/Pump 300 gpd/Pump 15 gpd/staff	500 900 90	$2,966
9 Gov. Peck	Commercial -Fuel	Employees	8	15 gpd/staff	120	$377
116 River Rd	Commercial- Fuel	Employees	10	15 gpd/staff	150	$433
Rte. 117	Mobile Home Park	Mobile Home	148	250 gpd/MH	37,000	$70,080
Subtotal Phase 3					**38,760**	**$73,856**
Subtotal Phase 1, 2 and 3					**45,525**	**$88,144**

***Based on estimates State "book flows" or existing State Permits**gpd x 1.89/Gal/Day + $150 Inspection Fee**

Table 17
Estimated Study Area Wastewater Hook-On Fees

Phase/ Address	Use Description	User Type	Quantity	Flow For Fee Basis*	Average Daily Flow (gpd)	Hook-On Fee*
Phase 1						
840 W Main	Commercial	Reap Office Building/ Employees	42	15 gpd/staff	630	$2,928
Subtotal Phase 1					**630**	**$2,928**
Phase 2						
878 W Main	Residential	Single Family Home	1	210 gpd/Unit	210	$1,076
920 W Main	Res./Commercial	Single Family Home/Tow Business	1	210 gpd/Unit	210	$1,076
932 W Main	Residential	Single Family Home/Home Business	1	210 gpd/Unit	210	$1,076
978 W Main	Residential	Single Family Home	1	210 gpd/Unit	210	$1,076
1010-1014 W Main	Residential	Duplex	2	210 gpd/Unit	420	$2,002
1008-1012 W Main	Residential	Duplex	2	210 gpd/Unit	420	$2,002
1070 W Main	Commercial	Office Bldg/Employees	20	15 gpd/staff	300	$1,473
1108 W Main	Commercial	Dog Day Care Employees Kennels Grooming Station	 8 40 1	 15 gpd/staff 25 gpd/kennel 400gpd/station	 120 1,000 400	$6,853
1151 W Main	Res./Commercial	Residence Chiropractor Office	1 3 16	210 gpd/Unit 35 gpd/staff 10 gpd/patient	210 105 160	$2,245
-	Vacant	Hay barn	-	-	-	
-	Vacant	Field South Side	-	-	-	
-	Vacant	Empty Lot	-	-	-	
Subtotal Phase 2					**3,975**	**$18,879**
Subtotal Phase 1 and 2					**4,605**	**$21,807**
Phase 3						
1436 W Main	Commercial Gas Station	1st Pump Set Add'l Pump Sets Employees	1 3 6	500 gpd/Pump 300 gpd/Pump 15 gpd/staff	500 900 90	$6,721
9 Gov. Peck	Commercial-Fuel	Employees	8	15 gpd/staff	120	$679
116River Rd	Commercial -Fuel	Employees	10	15 gpd/staff	150	$812
Rte. 117	Mobile Home Park	Mobile Homes	148	210 gpd/MH	31,080	$137,213
Subtotal Phase 3					**32,840**	**$145,425**
Subtotal Phase 1, 2 and 3					**37,445**	**$167,233**

***Based on estimates, State "book flows" or existing State Permits** ****gpd x 4.41/Gal/Day + $150 Inspection Fee**

Table 18
Estimated Study Area Existing Water Revenue

Phase/ Address	Use Description	User Type	Yearly* Quantity	Unit Cost	Annual Revenue
Phase 1					
840 W Main	Commercial	Reap Office Building/ Employees	4 229,950	$381.00/unit $9.77/1,000 gal	$1,524 $2,247
Subtotal Phase 1					**$3,771**
Phase 2					
878 W Main	Residential	Single Family Home	1 36,500	$130.64/unit $10.43/1,000 gal	$130.64 $381
920 W Main	Res./ Commercial	Single Family Home/Tow Business	1 36,500	$130.64/unit $10.43/1,000 gal	$130.64 $381
932 W Main	Residential	Single Family Home/ Home Business	1 36,500	$130.64/unit $10.43/1,000 gal	$130.64 $381
978 W Main	Residential	Single Family Home	1 36,500	$130.64/unit $10.43/1,000 gal	$130.64 $381
1010-1014 W Main	Residential	Duplex	2 73,000	$130.64/unit $10.43/1,000 gal	$261.28 $761
1008-1012 W Main	Residential	Duplex	2 73,000	$130.64/unit $10.43/1,000 gal	$261.28 $761
1070 W Main	Commercial	Office Building/Employees	4 109,500	$381.00/unit $9.77/1,000 gal	$1,524 $1,070
1108 W Main	Commercial	Dog Day Care	1 554,800	$381.00/unit $9.77/1,000 gal	$381 $5,420
1151 W Main	Res./ Commercial	Residence Chiropractor Office	1 133,225	$130.64/unit $10.43/1,000 gal	$130.64 $1,389
Subtotal Phase 2					**$12,961**
Subtotal Phase 1 and 2					**$16,732**
Phase 3					
1436 W Main	Commercial	Gas Station	1 543,850	$381.00/unit $9.77/1,000 gal	$381 $5,313
9 Gov. Peck	Commercial	Employees	1 43,800	$381.00/unit $9.77/1,000 gal	$381 $428
116 River Rd	Commercial	Employees	1 54,750	$381.00/unit $9.77/1,000 gal	$381 $535
Rte. 117	Mobile Home Park	Mobile Homes	148 7,670,840	$130.64/unit $10.43/1,000 gal	$19,335 $80,007
Subtotal Phase 3					**$106,761**
Subtotal Phase 1, 2 and 3					**$123,493**

*** Based on Table 3 values x 365 days/year**

Table 19
Estimated Study Area Existing Wastewater Revenue

Phase/ Address	Use Description	User Type	Yearly Quantity*	Unit Cost	Annual Revenue
Phase 1					
840 W Main	Commercial	Reap Office Building/ Employees	4 229,950	$519.98/unit $13.00/1,000 gal	$2,080 $2,990
Subtotal Phase 1					**$5,070**
Phase 2					
878 W Main	Residential	Single Family Home	1 36,500	$174.55/unit $14.13/1,000 gal	$174.55 $516
920 W Main	Res./Commercial	Single Family Home/Tow Business	1 36,500	$174.55/unit $14.13/1,000 gal	$174.55 $516
932 W Main	Residential	Single Family Home/ Home Business	1 36,500	$174.55/unit $14.13/1,000 gal	$174.55 $516
978 W Main	Residential	Single Family Home	1 36,500	$174.55/unit $14.13/1,000 gal	$174.55 $516
1010-1014 W Main	Residential	Duplex	2 73,000	$174.55/unit $14.13/1,000 gal	$349.10 $1,032
1008-1012 W Main	Residential	Duplex	2 73,000	$174.55/unit $14.13/1,000 gal	$349.10 $1,032
1070 W Main	Commercial	Office Building/Employees	4 109,500	$519.98/unit $13.00/1,000 gal	$2,080 $1,424
1108 W Main	Commercial	Dog Day Care	1 554,800	$519.98/unit $13.00/1,000 gal	$519.98 $7,212
1151 W Main	Res./ Commercial	Residence Chiropractor Office	1 133,225	$174.55/unit $14.13/1,000 gal	$174.55 $1,882
Subtotal Phase 2					**$17,421**
Subtotal Phase 1 and 2					**$22,491**
Phase 3					
1436 W Main	Commercial	Gas Station	1 543,850	$519.98/unit $13.00/1,000 gal	$519.98 $7,070
9 Gov. Peck	Commercial	Employees	1 43,800	$519.98/unit $13.00/1,000 gal	$519.98 $569
116 River Rd	Commercial	Employees	1 54,750	$519.98/unit $13.00/1,000 gal	$519.98 $712
Rte. 117	Mobile Home Park	Mobile Homes	148 7,670,840	$174.55/unit $14.13/1,000 gal	$25,833 $108,389
Subtotal Phase 3					**$144,133**
Subtotal Phase 1, 2 and 3					**$166,624**

*** Based on Table 3 values x 365 days/year**

6.4 Alternatives for Debt Financing

The proposed emergency access road for the school would be a school project. Therefore, alternatives for debt financing for the access road is not evaluated in this report. Appendix D outlines various scenarios for cost sharing and the impacts of costs on the entire system. The major theme running throughout the 3 tables is a desire of the Water and Sewer Commission to, due to recent rate increases, to present financing options which cause no rate increase, or in the case of construction of all 3 phases, a decrease in rates. Table D-1 outlines the cost vs. revenue for Phase I only construction and the initial monetary contribution of $388,050 which would be required for the project to be constructed with no rate increase. . Table D-2 outlines the cost vs. revenue for Phase 1 and II only construction and the initial contribution of $319,700 which would be required for the project to be constructed with no rate increase. Table D-3 outlines the cost vs. revenue for Phase 1, II and III construction and the initial contribution of $0 which would be required for the project to be constructed and result in a decrease in rates for each user of approximately $209 per year.

6.5 Financing Options

A. State Funding

The Town of Richmond may be eligible to receive financial assistance from the State of Vermont for the proposed water and/or system extensions, as funds are available based on need and to rectify existing deficiencies. This assistance would be from the Agency of Natural Resources, Drinking Water State Revolving Fund (DWSRF) or the Clean Water State Revolving Loan Fund (sewer) in the form of a low interest loan for, most likely, a term of twenty years. A recent Income Survey for the water and sewer service area indicated a median household income of $51,000 per year for State Funding Purposes which is less than the Median Household Income threshold and would qualify Richmond for potential subsidized assistance.. The new service area would need to have an updated income survey performed to determine final eligibility for funding. The more likely of the two funding sources would be the CWSRF, which is utilized for cost projections in the study

B. Federal Funding

USDA Rural Development (RD) administers a program that provides loans (30 to 40-year terms) based on the Median Household Income (MHI) of the service area (similar to the State Funding). The RD loan program is divided into three categories. Those categories, and the debt ratios and interest rates associated with them, are as follows:

RURAL DEVELOPMENT LOANS

Category	Maximum Grant (% of eligible project costs)	Loan Interest Rate (adjusted quarterly)
Poverty	75%	2.375%
Intermediate	45%	3.25%
Market	0	4.5%

RD funding is based on the most recent (2010) American Community Survey Census. Based on the Median Household Income (MHI) from the ACS census of $57,750 per year for the existing water and sewer service area Richmond of $41,103 per year, the system appears to qualify for the disadvantaged or "poverty" category making the projects potentially eligible for grant funds and a lower interest rate.. A confidential income survey should be conducted specific to the Study Area users, to confirm the project qualifies for a lower or subsidized project funding package.

RD also will consider each project for GRANTS, which would reduce the LOAN amount. Each project is evaluated for GRANT eligibility, following approval of Preliminary Engineering Report.

Both federal and state funds have some limitations associated with them. Some of those limitations are:

i). The level of funding for both programs is not guaranteed. The programs can be dropped or reduced in the future.

ii). The Municipality must not be able to borrow on the commercial market at a reasonable rate.

iii). Priorities based on public health and economic factors for the projects are established in order to allocate the available federal and state funds.

iv). Annual operation and maintenance costs are not eligible for federal or state funds.

v). Either program will not grant or loan unlimited funds to individual projects. Each project is evaluated on a cost per individual user basis. If that cost per user is excessively high, the funding agencies may adjust the amount of grant funds, the interest rate or the length of payback to a level appropriate to the type of system involved.

vi). In order to utilize RD funds, water meters must be installed (which is already the case/planned in Richmond).

C. Vermont Municipal Bond Bank Funding

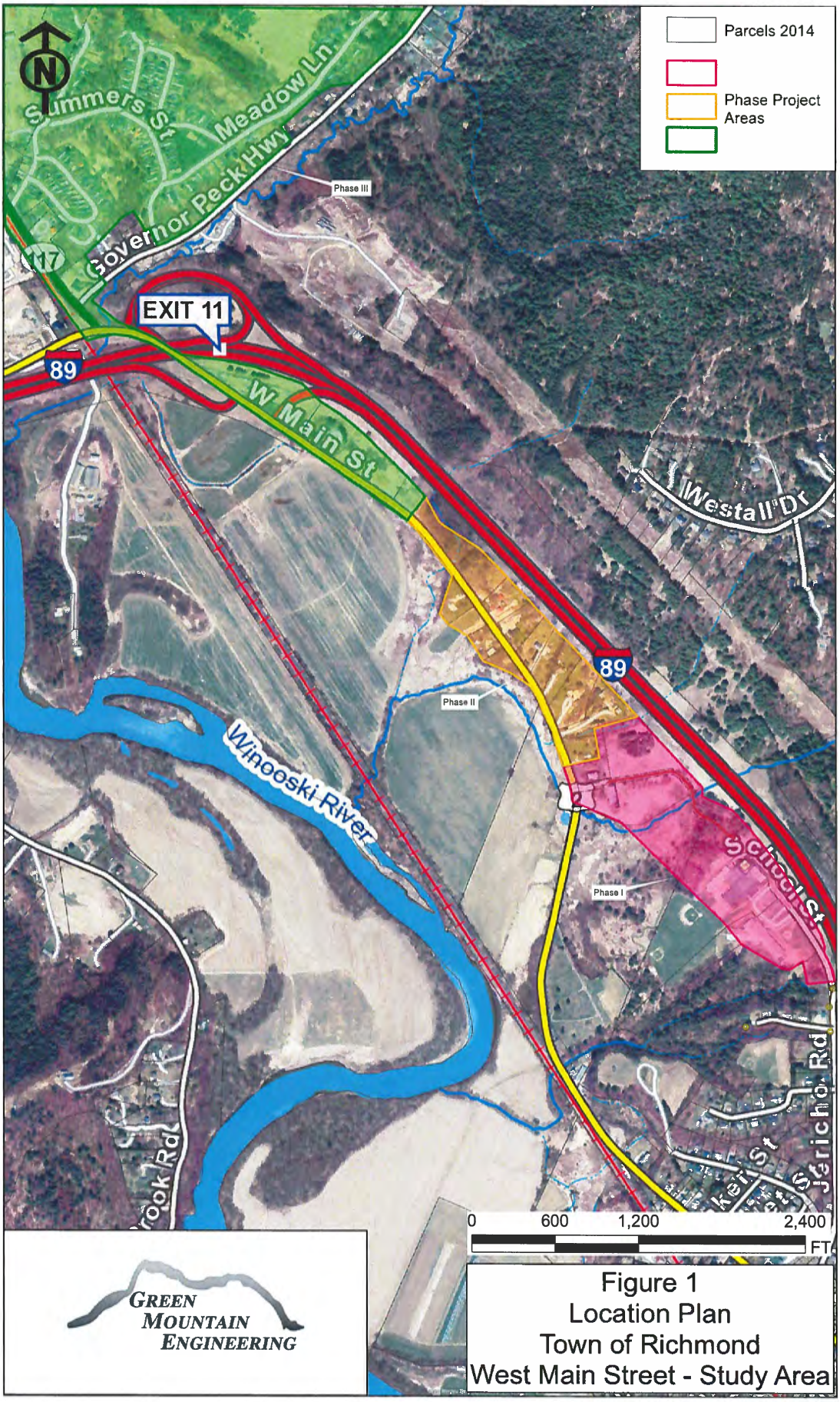
The Vermont Municipal Bond Bank issues low interest tax exempt bonds for eligible municipalities for funding of Infrastructure, Water and Sewer system construction. These are generally issued with up to a 30 year term with an interest rate set at time of issuance (currently approximately 4%). We have assumed this funding @ 4% for 30 years for the water portion of the project for planning purposes.

D. Commercial Financing / Project Funds "Set Aside"

The Town of Richmond has, in the past, gone directly to local banks for funding of various projects and items for public use and benefit. The term and interest rates for this type of loan, though, usually precludes this type of financing for this size project due to the larger annual payments required to pay the debt service.

APPENDIX A

FIGURES



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Appendix A1

Zoning District Map
Richmond, Vermont

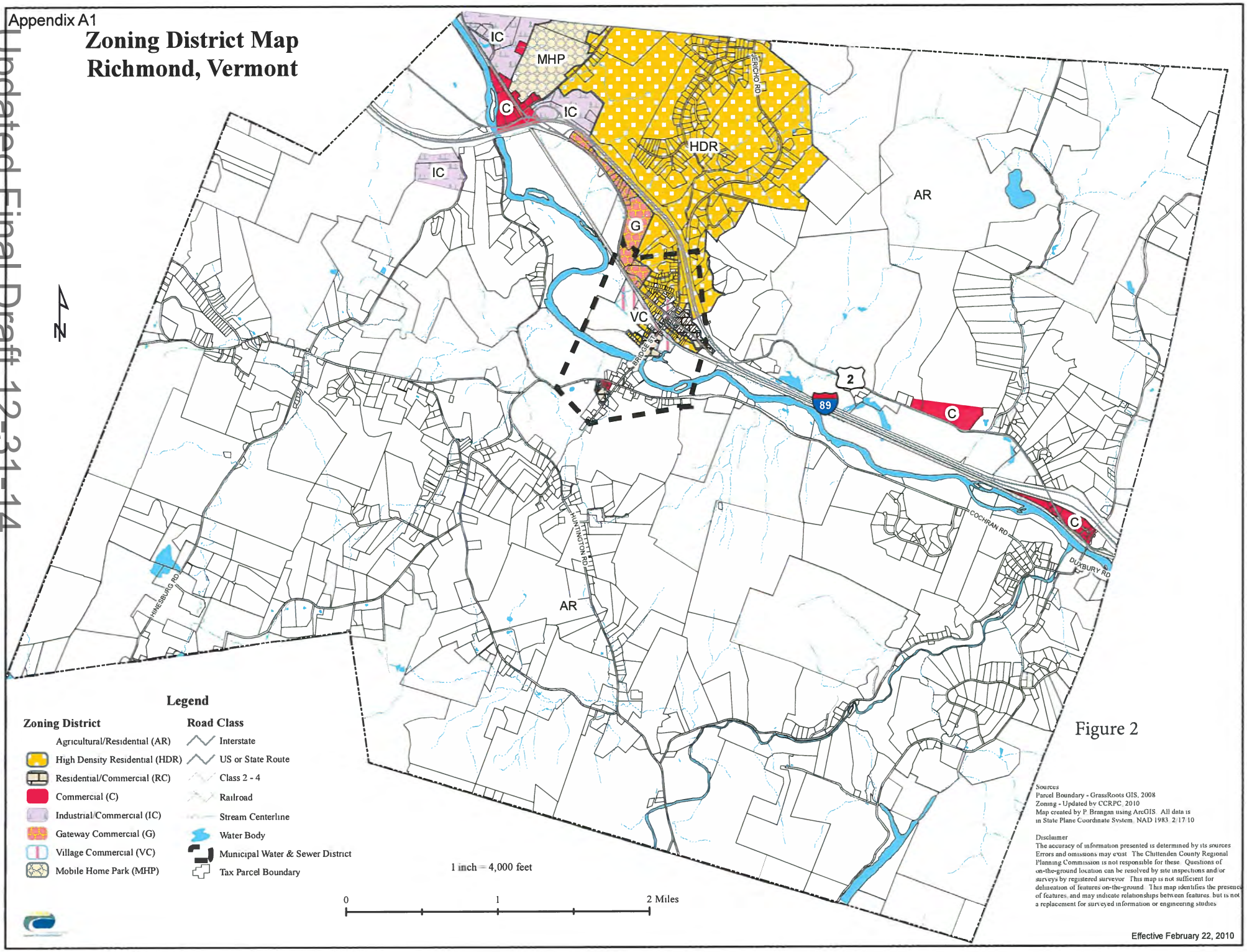


Figure 2

Sources
Parcel Boundary - GrassRoots GIS, 2008
Zoning - Updated by CCRPC 2010
Map created by P. Brangan using ArcGIS. All data is in State Plane Coordinate System, NAD 1983, 2/17/10

Disclaimer
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

Effective February 22, 2010

Updated Final Draft 12-31-14

GREEN MOUNTAIN ENGINEERING

Figure 3
Proposed School Emergency Acess Road
Town of Richmond
Access Road With Water and Sewer Extensions for West Main Street

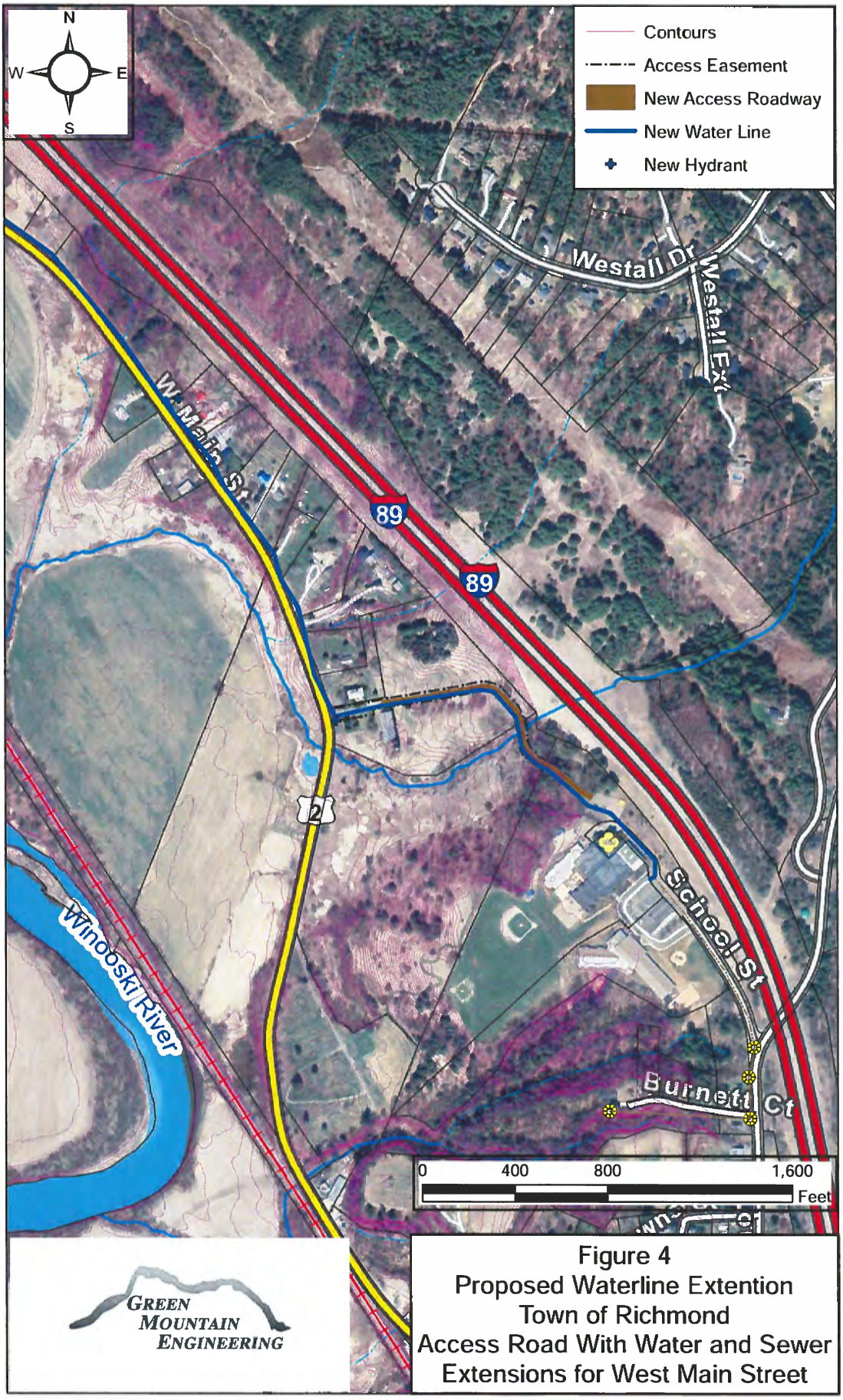
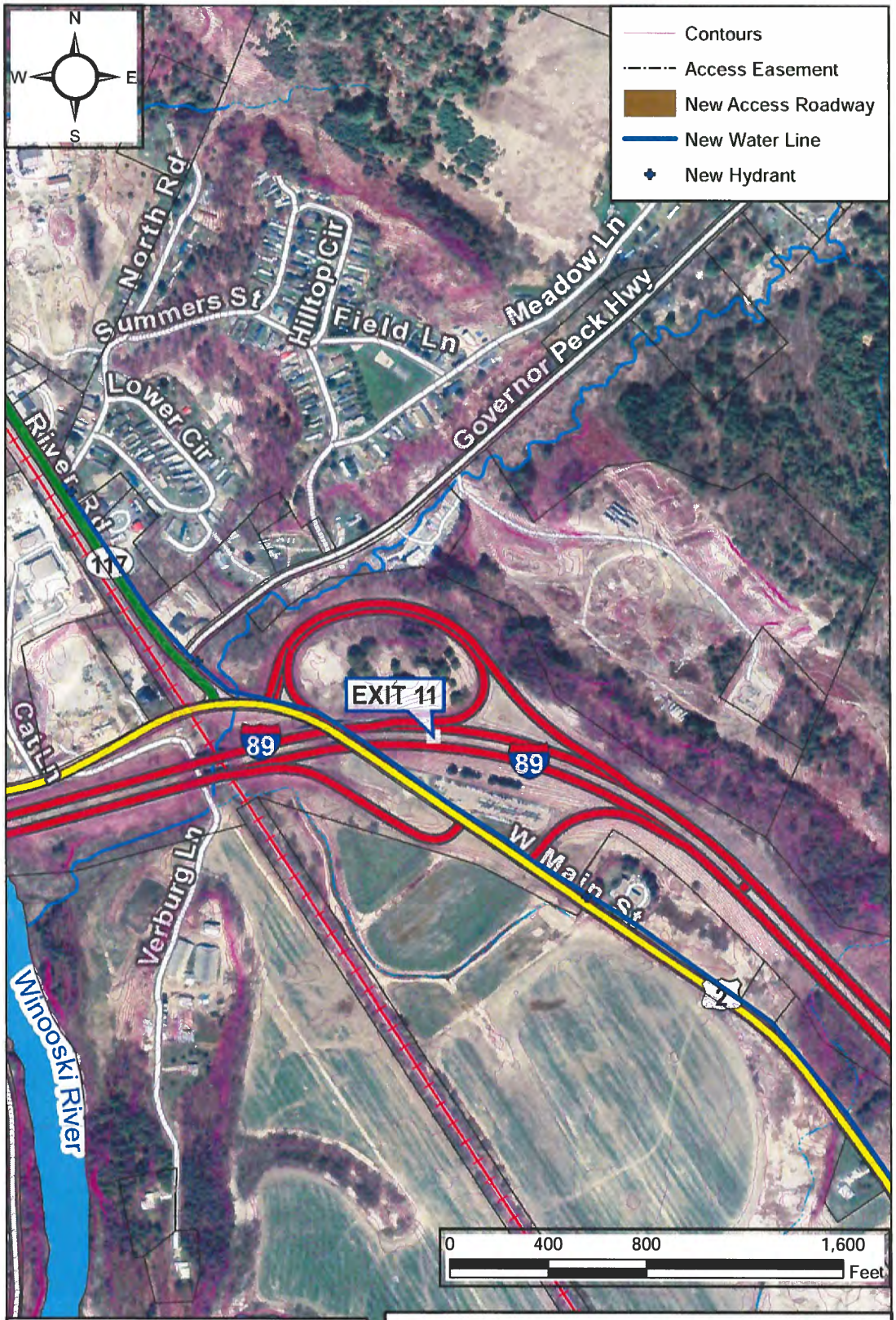


Figure 4
Proposed Waterline Extention
Town of Richmond
Access Road With Water and Sewer
Extensions for West Main Street



GREEN MOUNTAIN ENGINEERING

Figure 4A
Proposed Waterline Extention - Phase III
Town of Richmond
Access Road With Water and Sewer Extensions for West Main Street

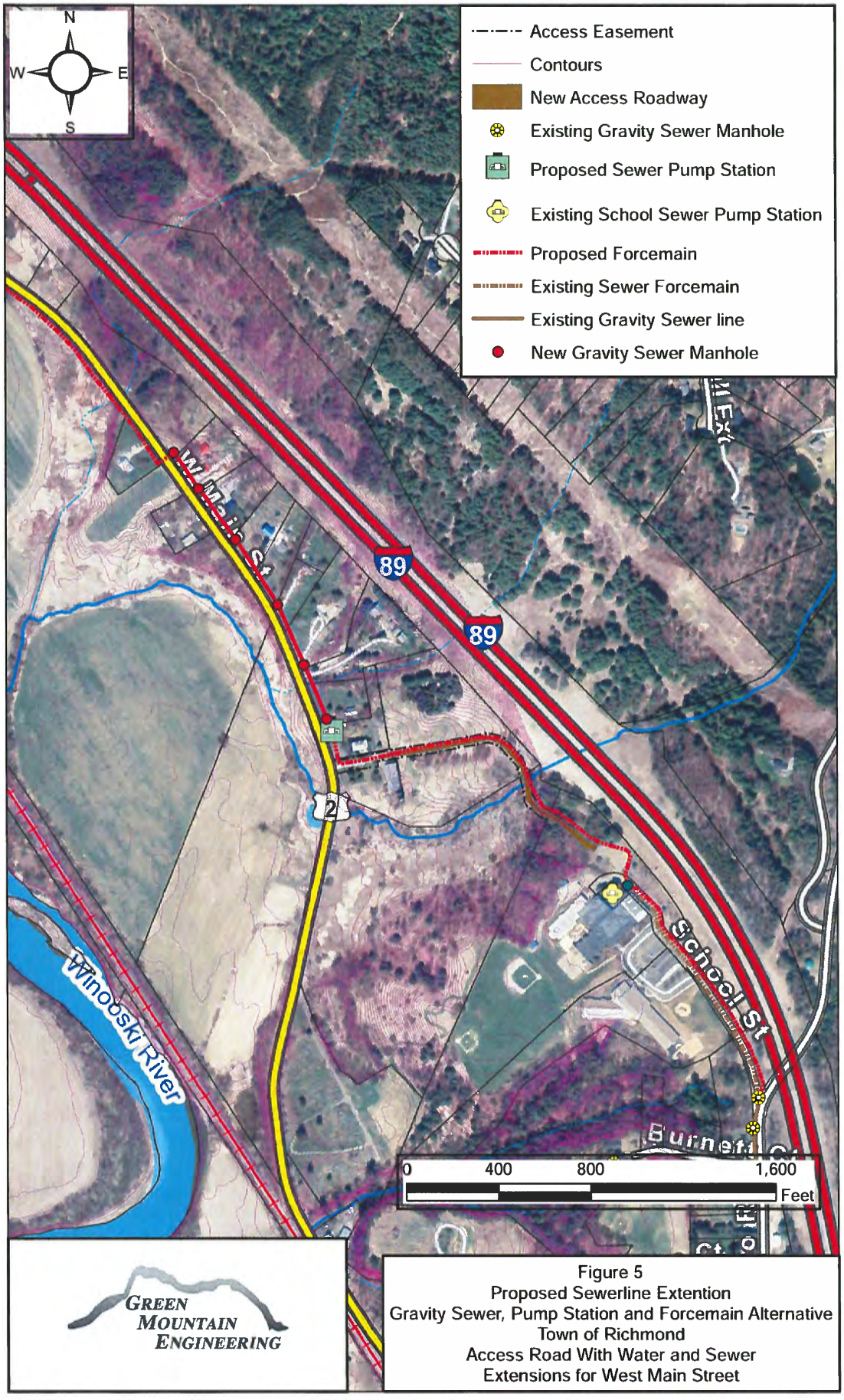


Figure 5
Proposed Sewerline Extention
Gravity Sewer, Pump Station and Forcemain Alternative
Town of Richmond
Access Road With Water and Sewer
Extensions for West Main Street

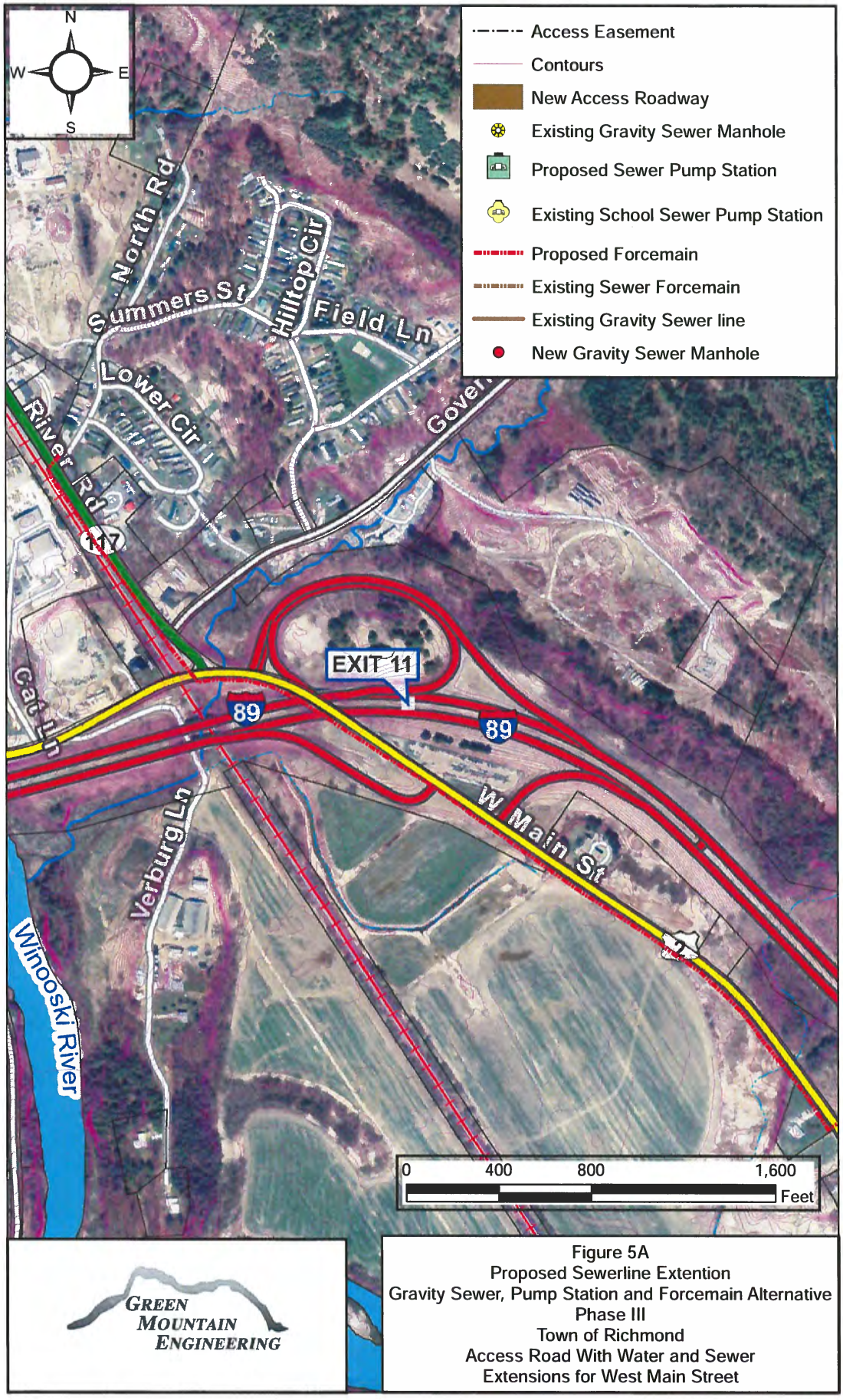


Figure 5A
Proposed Sewerline Extention
Gravity Sewer, Pump Station and Forcemain Alternative
Phase III
Town of Richmond
Access Road With Water and Sewer
Extensions for West Main Street

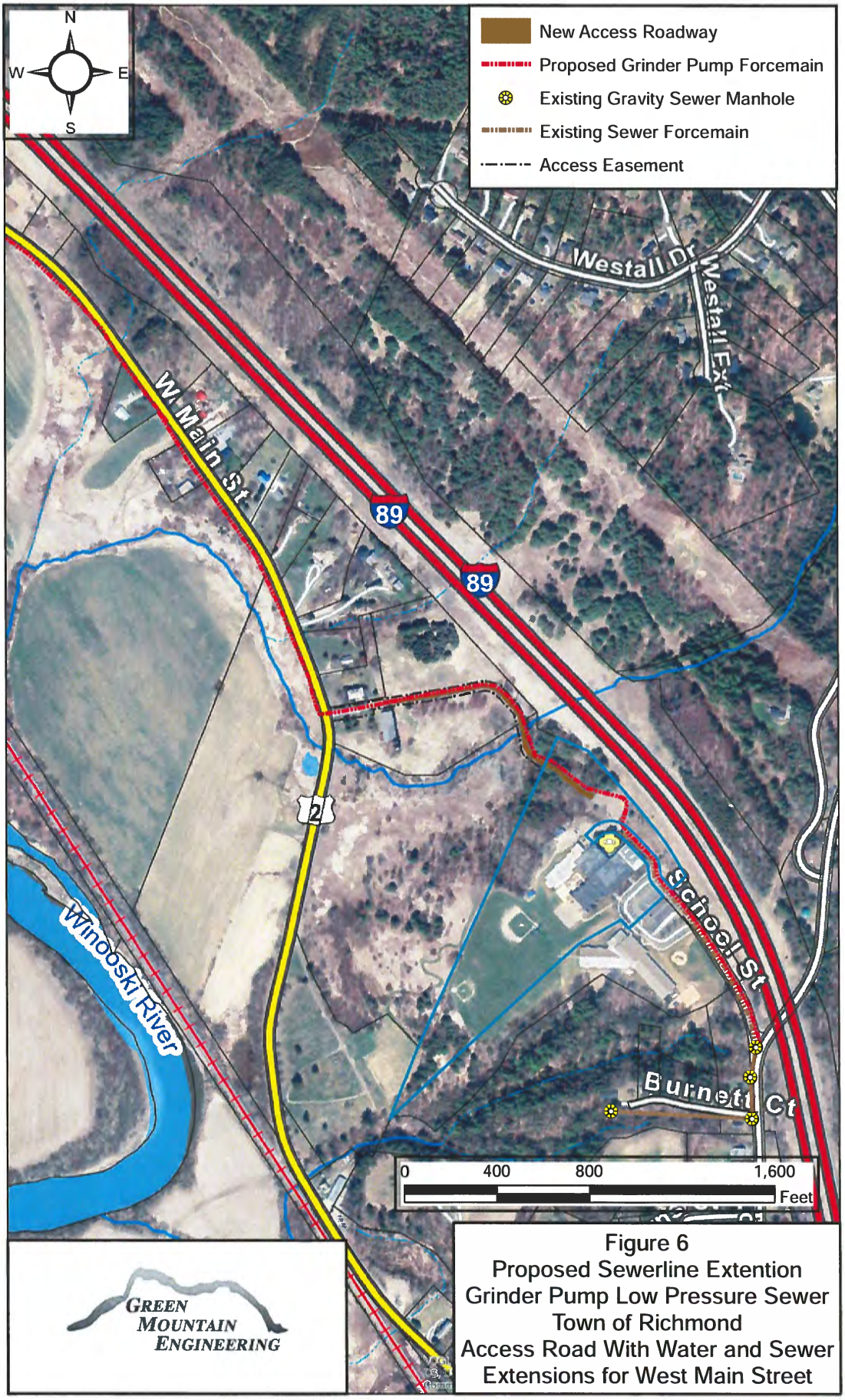
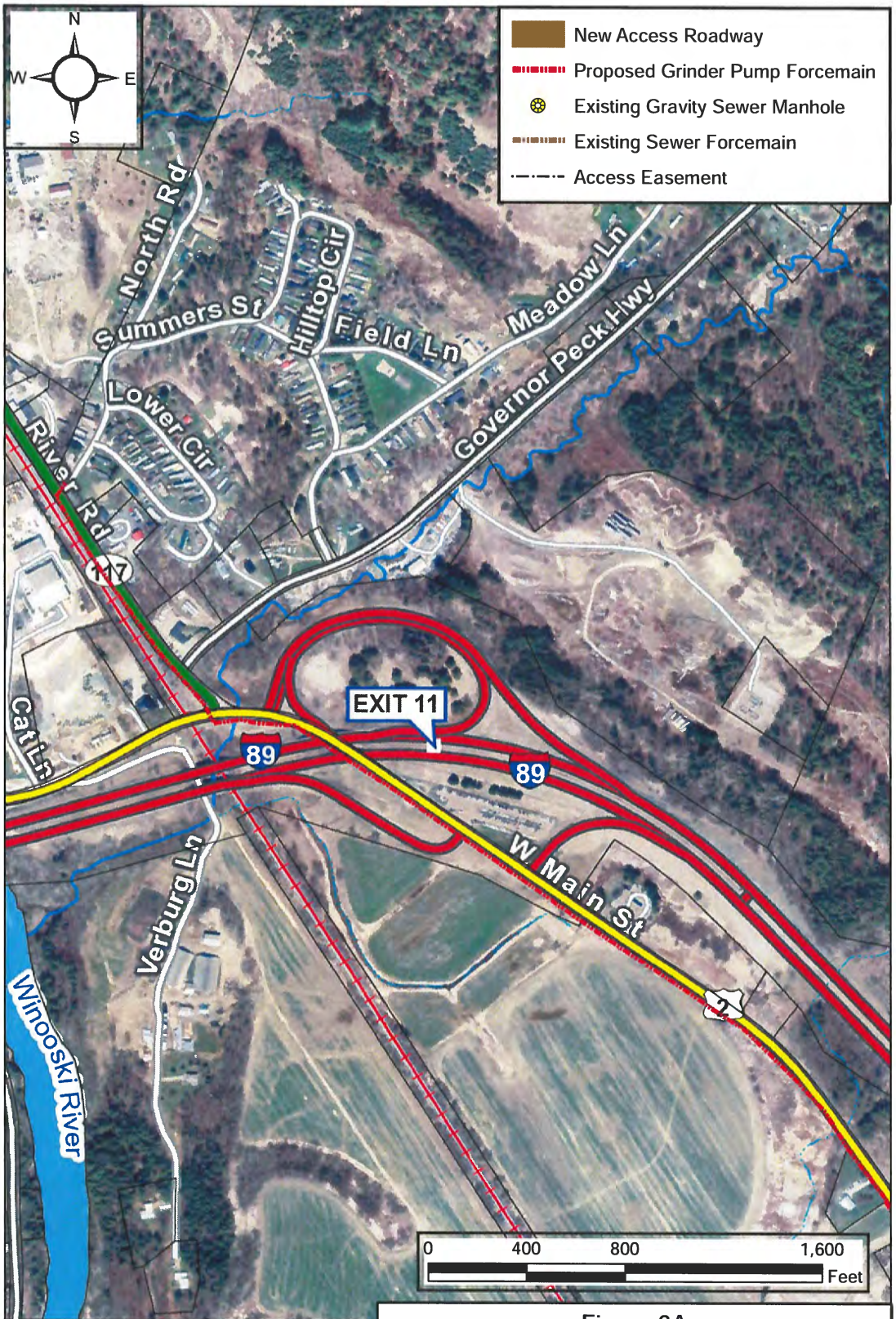


Figure 6
Proposed Sewerline Extention
Grinder Pump Low Pressure Sewer
Town of Richmond
Access Road With Water and Sewer
Extensions for West Main Street



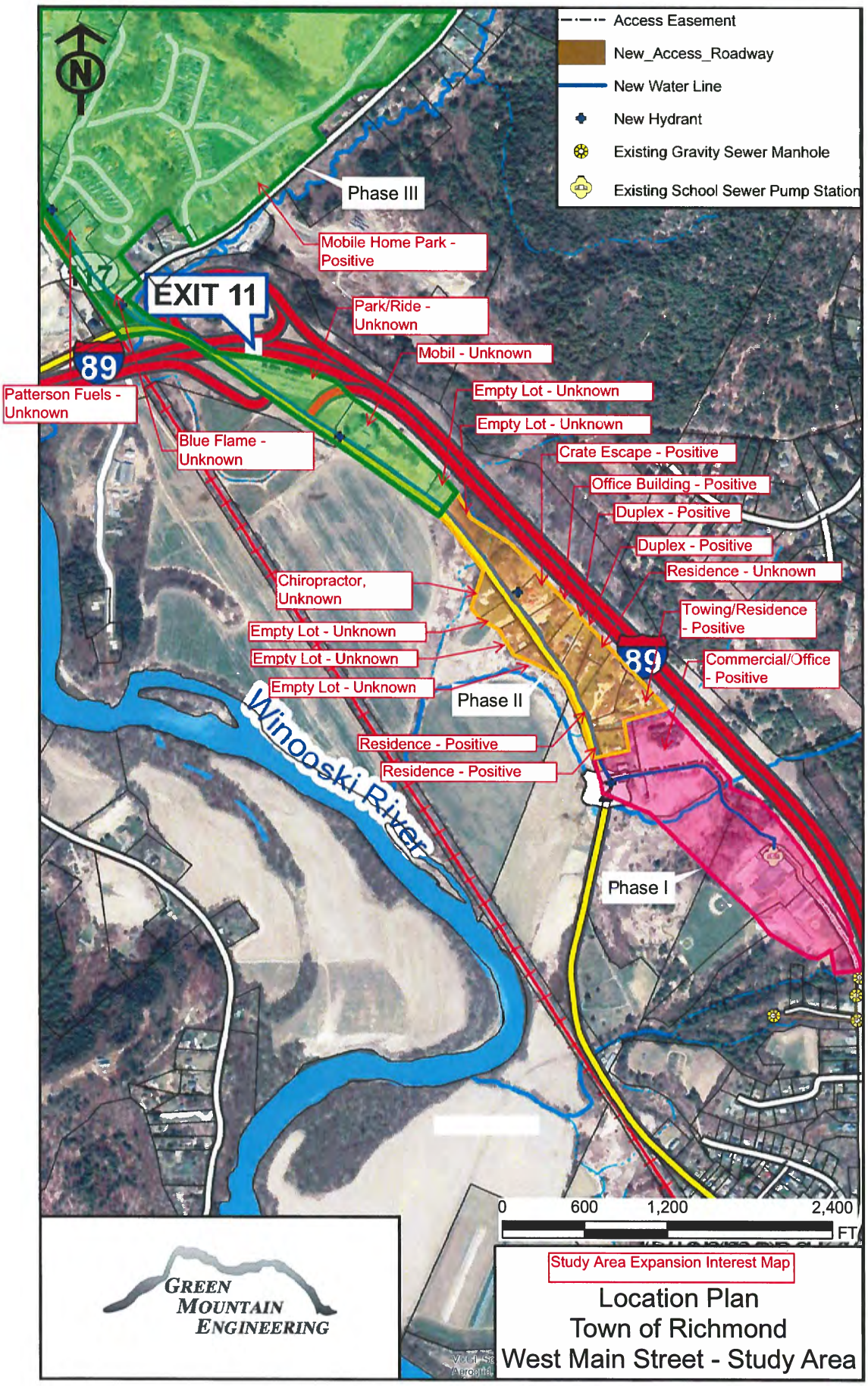
GREEN MOUNTAIN ENGINEERING

Figure 6A
Proposed Sewerline Extention
Grinder Pump Low Pressure Sewer- Phase III
Town of Richmond
Access Road With Water and Sewer
Extensions for West Main Street

Updated Final Draft 12-31-14

APPENDIX B

PROPERTY OWNER SURVEYS



Updated Final Draft 12-31-14

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: Robert + Joy Reap Phone: 434-4993
Address: 840 West Main St. (mail PO Box 442)
Richmond, VT 05477

2. Type of User (Check One)

___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)
___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)
___ Unsure
___ None, it will stay as it is

3. Location

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

X Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) _____

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

X Leachfield
___ Mound system
___ Other (explain)
___ No wastewater used at present (vacant lot for example)

6. Does your current wastewater disposal system limit your development potential? If so, how?

Yes, greatly so.

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) X Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: Rod West
Address: 878 + 920 W. Main
Phone: 434-5751

2. Type of User (Check One)

2 X ✓ Single Family Residential (Seasonal ___ or Year Round ✓) x 2 878 + 920
___ Multi-Family Residential (Indicate number of units _____)
___ Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)
___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
___ Commercial
___ Agricultural
___ Other (Specify _____)
✓ Unsure but lean toward commercial
___ None, it will stay as it is

3. Location

?

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

✓ Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) _____

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

___ Leachfield
✓ Mound system
___ Other (explain)
___ No wastewater used at present (vacant lot for example)

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[illegible]RICHMOND

6. Does your current wastewater disposal system limit your development potential? If so, how?

mound system ! @ 920
unknown conventional @ 898

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) ✓ Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: Peter Mumford Phone: 434-2239
Address: PO Box 995
Richmond VT 05477

2. Type of User (Check One)

- [X] Single Family Residential (Seasonal ___ or Year Round ___)
- [ ] Multi-Family Residential (Indicate number of units _____)
- [X] Commercial
- [ ] Agricultural
- [ ] Other (Specify _____)

3. What are your future plans for this property? (Check one)

- [ ] Single Family Residential (Seasonal ___ or Year Round ___)
- [X] Multi-Family Residential (Indicate number of units 6)
- [X] Commercial
- [ ] Agricultural
- [ ] Other (Specify _____)
- [ ] Unsure
- [ ] None, it will stay as it is

3. Location 932 W. Main St

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

- [X] Drilled Well
- [ ] Shallow Dug Well
- [ ] Cistern
- [ ] Bottled Water
- [ ] Other (explain) _____

- [ ] No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

- [X] Leachfield
- [ ] Mound system
- [ ] Other (explain)
- [ ] No wastewater used at present (vacant lot for example)

6. Does your current wastewater disposal system limit your development potential? If so, how?

Yes Testin has determined there is not a back-up location

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) ✓ Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: Chris Perren Phone: 802 999 8185
Address: 1012 west main St
Richmond VT

2. Type of User (Check One)

___ Single Family Residential (Seasonal ___ or Year Round ___)
_✓_ Multi-Family Residential (Indicate number of units _2_)
___ Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)
___ Single Family Residential (Seasonal ___ or Year Round ___)
_✓_ Multi-Family Residential (Indicate number of units _____)
_✓_ Commercial
___ Agricultural
___ Other (Specify _____)
___ Unsure
___ None, it will stay as it is

3. Location

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

_✓_ Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) _____

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

_✓_ Leachfield
___ Mound system
___ Other (explain)
___ No wastewater used at present (vacant lot for example)

6. Does your current wastewater disposal system limit your development potential? If so, how? Yes Future Development

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) ✓ Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Chris Perron @ 1012 W Main also shares the same intentions. His # is 999-8185

Name: Mike Stromme Phone: 802-999-8502
Address: 1014 W Main St

2. Type of User (Check One)

___ Single Family Residential (Seasonal ___ or Year Round ___)
_X_ Multi-Family Residential (Indicate number of units _2_)
___ Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)

___ Single Family Residential (Seasonal ___ or Year Round ___)
_X_ Multi-Family Residential (Indicate number of units _9_) 3, 3-unit buildings
___ Commercial
___ Agricultural
___ Other (Specify _____)
___ Unsure
___ None, it will stay as it is

3. Location

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

_X_ Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) _____

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

_X_ Leachfield
___ Mound system
___ Other (explain)
___ No wastewater used at present (vacant lot for example)

6. Does your current wastewater disposal system limit your development potential? If so, how?

Yes, Zoning allows for 1 building per 1 acre, with town wastewater it allows for 1 building per 1/3 acre.

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) X Yes ____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

Would like to add residential housing, but limited with current water/sewer hookups.

Thanks!

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: Jeffrey K. Palin Phone: 434-4652
Address: 1070 W. main ST.
Richmond, VT 05477

2. Type of User (Check One)

___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)
___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)
___ Unsure
___ None, it will stay as it is

3. Location

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

X Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) _____

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

X Leachfield
___ Mound system
___ Other (explain)
___ No wastewater used at present (vacant lot for example)

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TOWN OF RICHMOND

6. Does your current wastewater disposal system limit your development potential? If so, how?

not sure.

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) X Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

We see this development as an asset to the Gateway community of Richmond.

Richmond Water Resources Department
PO Box 285, Richmond, VT 05477

Service Area Expansion Survey

1. (OPTIONAL)

Name: TAMMY SCHEY Phone: 802 373-6546
Address: 1108 WEST MAIN ST
RICHMOND, VT 05477

2. Type of User (Check One)

___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)

3. What are your future plans for this property? (Check one)
___ Single Family Residential (Seasonal ___ or Year Round ___)
___ Multi-Family Residential (Indicate number of units _____)
X Commercial
___ Agricultural
___ Other (Specify _____)
___ Unsure
___ None, it will stay as it is

3. Location

Place an **X** on the attached map to indicate your approximate location. This information will be used to determine where expansion is feasible. **(If you do not know where to put the X, make sure your Richmond street address is above).**

4. What is your present source of water? (Check all that apply)

X Drilled Well
___ Shallow Dug Well
___ Cistern
___ Bottled Water
___ Other (explain) shared well on adjacent property

___ No water used at present (vacant lot for example)

5. What is your present form of wastewater disposal? (Check all that apply)

✓ Leachfield
___ Mound system
✓ Other (explain)
___ No wastewater used at present (vacant lot for example)

6. Does your current wastewater disposal system limit your development potential? If so, how? Yes, we can not expand our business with the current septic system nor is there adequate appropriate soil for an adequate upgrade.

7. Would you be willing to connect to the system by paying the required connection and allocation fees and becoming a paying permanent member of the system?
(Check One) X Yes _____ No

8. If this questionnaire does not address your present or future needs, please explain, or use this space to ask questions.

APPENDIX C

DETAILED CONSTRUCTION COST ESTIMATES

TABLE C-1

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Emergency Access Road

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
EMERGENCY ACCESS ROAD							
Clearing and Grubbing	1	Acre	$10,000	$10,000	$10,051	$10,256	$10,462
Common Fill Subgrade	27,900	CY	$28	$781,200	$785,206	$801,231	$817,255
90" CMP Culvert	150	EA.	$350	$52,500	$52,769	$53,846	$54,923
15" CMP Culvert	40	L.F.	$80	$3,200	$3,216	$3,282	$3,348
12" Gravel Subbase	400	C.Y.	$28	$11,200	$11,257	$11,487	$11,717
6" Fine Crushed Gravel Surface	200	C.Y.	$30	$6,000	$6,031	$6,154	$6,277
Geotextile Fabric	1,200	S.Y.	$2	$2,400	$2,412	$2,462	$2,511
Topsoil	800	C.Y.	$25	$20,000	$20,103	$20,513	$20,923
Seeding, Fertilizer and Liming	1.5	Acre	$1,000	$1,500	$1,508	$1,538	$1,569
Mulching	1.5	Acre	$1,000	$1,500	$1,508	$1,538	$1,569
Silt Fence	800	L.F.	$4	$2,800	$2,814	$2,872	$2,929
Rock Check Dams	6	EA.	$175	$1,050	$1,055	$1,077	$1,098
Site Prep and Miscellaneous (8%)	1	L.S.	$71,468	$71,468	$71,835	$73,301	$74,767
Contingency (10%)	1	L.S.	$96,482	$96,482	$96,977	$98,956	$100,935
Contractor's Bonds (2%)	1	L.S.	$21,226	$21,226	$21,335	$21,770	$22,206
			Subtotal	**$1,082,526**	**$1,088,077**	**$1,110,283**	**$1,132,489**
			USE	**$1,083,000**	**$1,089,000**	**$1,111,000**	**$1,133,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-2
CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Phase I: Water Line Extension- School to West Main Street

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WATER SYSTEM							
8" Diameter PVC Water Main	1,800	L.F.	$80	$144,000	$144,738	$147,692	$150,646
8" x 8" Tapping Sleeve & Valve	1	EA.	$3,000	$3,000	$3,015	$3,077	$3,138
3/4" Diameter HDPE House Service	44	L.F.	$42	$1,848	$1,857	$1,895	$1,933
1" Diameter HDPE House Service	21	L.F.	$50	$1,050	$1,055	$1,077	$1,098
Existing Waterline Connections	1	EA.	$2,500	$2,500	$2,513	$2,564	$2,615
8" Gate Valve	1	EA.	$1,300	$1,300	$1,307	$1,333	$1,360
3/4" Curb Stops and Boxes	1	EA.	$200	$200	$201	$205	$209
3/4" Corporation Stops	1	EA.	$300	$300	$302	$308	$314
1" Curb Stops and Boxes	2	EA.	$350	$700	$704	$718	$732
1" Corporation Stops	2	EA.	$350	$700	$704	$718	$732
Fire Hydrant Branch Connection	1	EA.	$4,250	$4,250	$4,272	$4,359	$4,446
Rigid Trench Insulation	200	S.F.	$2	$400	$402	$410	$418
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Dust Control	2	Ton	$500	$1,000	$1,005	$1,026	$1,046
Permanent Trench Pavement Repair	10	S.Y.	$60	$600	$603	$615	$628
Traffic Control	0	L.S.	$0	$0	$0	$0	$0
Site Prep and Miscellaneous (8%)	1	L.S.	$14,712	$14,712	$14,787	$15,089	$15,391
Contingency (10%)	1	L.S.	$19,861	$19,861	$19,963	$20,370	$20,778
Contractor's Bonds (2%)	1	L.S.	$4,369	$4,369	$4,392	$4,481	$4,571
			Subtotal	**$222,840**	**$223,983**	**$228,554**	**$233,125**
			USE	**$223,000**	**$224,000**	**$229,000**	**$234,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-3

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Phase II Water Line Extension- Reap Property to Gateway District Border

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WATER SYSTEM							
8" Diameter PVC Water Main	1,600	L.F.	$80	$128,000	$128,656	$131,282	$133,908
20" Jack & Bore Steel Sleeve	50	L.F.	$800	$40,000	$40,205	$41,026	$41,846
3/4" Diameter HDPE House Service Boring	308	L.F.	$42	$12,936	$13,002	$13,268	$13,533
1" Diameter HDPE House Service Boring	220	L.F.	$50	$11,000	$11,056	$11,282	$11,508
Existing Waterline Connections	0	EA.	$2,500	$0	$0	$0	$0
8" Gate Valve	1	EA.	$1,300	$1,300	$1,307	$1,333	$1,360
3/4" Curb Stops and Boxes	7	EA.	$200	$1,400	$1,407	$1,436	$1,465
3/4" Corporation Stops	7	EA.	$300	$2,100	$2,111	$2,154	$2,197
1" Curb Stops and Boxes	5	EA.	$350	$1,750	$1,759	$1,795	$1,831
1" Corporation Stops	5	EA.	$350	$1,750	$1,759	$1,795	$1,831
Fire Hydrant Branch Connection	1	EA.	$4,250	$4,250	$4,272	$4,359	$4,446
Rigid Trench Insulation	200	S.F.	$2	$400	$402	$410	$418
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Dust Control	2	Ton	$500	$1,000	$1,005	$1,026	$1,046
Permanent Trench Pavement Repair	0	S.Y.	$60	$0	$0	$0	$0
Traffic Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Site Prep and Miscellaneous (8%)	1	L.S.	$19,035	$19,035	$19,132	$19,523	$19,913
Contingency (10%)	1	L.S.	$25,697	$25,697	$25,829	$26,356	$26,883
Contractor's Bonds (2%)	1	L.S.	$5,653	$5,653	$5,682	$5,798	$5,914
			Subtotal	**$288,321**	**$289,800**	**$295,714**	**$301,628**
			USE	**$289,000**	**$290,000**	**$296,000**	**$302,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-4

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Phase III Water Line Extension- Gateway District Border to Mobile Home Park

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WATER SYSTEM							
8" Diameter PVC Water Main	900	L.F.	$80	$72,000	$72,369	$73,846	$75,323
10" Diameter PVC Water Main	3,600	L.F.	$90	$324,000	$325,662	$332,308	$338,954
20" Jack & Bore Steel Sleeve	150	L.F.	$800	$120,000	$120,615	$123,077	$125,538
3/4" Diameter HDPE House Service Boring	20	L.F.	$42	$840	$844	$862	$879
1" Diameter HDPE House Service Boring	10	L.F.	$50	$500	$503	$513	$523
Existing Waterline Connections	1	EA.	$2,500	$2,500	$2,513	$2,564	$2,615
8" Gate Valve	3	EA.	$1,300	$3,900	$3,920	$4,000	$4,080
10" Gate Valve	1	EA.	$2,000	$2,000	$2,010	$2,051	$2,092
3/4" Curb Stops and Boxes	2	EA.	$200	$400	$402	$410	$418
3/4" Corporation Stops	2	EA.	$300	$600	$603	$615	$628
1" Curb Stops and Boxes	1	EA.	$350	$350	$352	$359	$366
1" Corporation Stops	1	EA.	$350	$350	$352	$359	$366
Meter Pit	1	EA.	$10,000	$10,000	$10,051	$10,256	$10,462
Fire Hydrant Branch Connection	3	EA.	$4,250	$12,750	$12,815	$13,077	$13,338
Rigid Trench Insulation	800	S.F.	$2	$1,600	$1,608	$1,641	$1,674
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Dust Control	2	Ton	$500	$1,000	$1,005	$1,026	$1,046
Permanent Trench Pavement Repair	0	S.Y.	$60	$0	$0	$0	$0
Traffic Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Site Prep and Miscellaneous (8%)	1	L.S.	$46,787	$46,787	$47,027	$47,987	$48,947
Contingency (10%)	1	L.S.	$63,163	$63,163	$63,487	$64,782	$66,078
Contractor's Bonds (2%)	1	L.S.	$13,896	$13,896	$13,967	$14,252	$14,537
			Subtotal	**$708,686**	**$712,320**	**$726,857**	**$741,394**
			USE	**$709,000**	**$713,000**	**$727,000**	**$742,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-5

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Sewer Pump Station & 4" Forcemain- School to Reap Property

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
4" Diameter HDPE Forcemain	1,500	L.F.	$50	$75,000	$75,385	$76,923	$78,462
5' Diameter Air Release Manhole	1	EA.	$8,000	$8,000	$8,041	$8,205	$8,369
5' Diameter Valve Manhole	1	EA.	$10,000	$10,000	$10,051	$10,256	$10,462
Rigid Trench Insulation	200	S.F.	$2	$400	$402	$410	$418
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Dust Control	2	Ton	$500	$1,000	$1,005	$1,026	$1,046
Permanent Trench Pavement Repair	10	S.Y.	$60	$600	$603	$615	$628
Traffic Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Pump Station	1	L.S.	$200,000	$200,000	$201,026	$205,128	$209,231
Site Prep and Miscellaneous (8%)	1	L.S.	$10,164	$10,164	$10,216	$10,425	$10,633
Contingency (10%)	1	L.S.	$33,721	$33,721	$33,894	$34,586	$35,278
Contractor's Bonds (2%)	1	L.S.	$7,419	$7,419	$7,457	$7,609	$7,761
			Subtotal	**$378,354**	**$380,294**	**$388,055**	**$395,817**
			USE	**$379,000**	**$381,000**	**$389,000**	**$396,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-6

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
8" Gravity Sewer- Reap Property to Gateway District Boarder

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
8" PVC Gravity Sewer	1,600	L.F.	$60	$96,000	$96,492	$98,462	$100,431
4' Diameter Manholes	6	EA.	$3,500	$21,000	$21,108	$21,538	$21,969
8" x 4" Service Wye	7	EA.	$100	$700	$704	$718	$732
8" x 6" Sewervice Wye	7	EA.	$150	$1,050	$1,055	$1,077	$1,098
4" Sewer Service	70	L.F.	$50	$3,500	$3,518	$3,590	$3,662
6" Sewer Service	70	L.F.	$53	$3,710	$3,729	$3,805	$3,881
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Dust Control	2	Ton	$500	$1,000	$1,005	$1,026	$1,046
Permanent Trench Pavement Repair	20	S.Y.	$60	$1,200	$1,206	$1,231	$1,255
Traffic Control	1	L.S.	$10,000	$10,000	$10,051	$10,256	$10,462
Site Prep and Miscellaneous (8%)	1	L.S.	$12,817	$12,817	$12,883	$13,145	$13,408
Contingency (10%)	1	L.S.	$17,303	$17,303	$17,391	$17,746	$18,101
Contractor's Bonds (2%)	1	L.S.	$3,807	$3,807	$3,826	$3,904	$3,982
			Subtotal	**$194,136**	**$195,132**	**$199,114**	**$203,096**
			USE	**$195,000**	**$196,000**	**$200,000**	**$204,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-7

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Phase I: 3" Low Pressure Grinder Pump Forcemain- School to Reap Property

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
3" HDPE LPS	2,600	L.F.	$42	$109,200	$109,760	$112,000.00	$114,240
5' Diameter Air Release Manhole	1	EA.	$8,000	$8,000	$8,041	$8,205.13	$8,369
1 1/2" LPS Service	63	L.F.	$35	$2,205	$2,216	$2,261.54	$2,307
1 1/2" Curb Stops and Boxes	3	EA.	$250	$750	$754	$769.23	$785
Core Existing Manhole	1	L.S.	$1,500	$1,500	$1,508	$1,538.46	$1,569
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564.10	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,230.77	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410.26	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641.03	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$512.82	$523
Erosion Control	1	L.S.	$2,500	$2,500	$2,513	$2,564.10	$2,615
Dust Control	1	Ton	$500	$250	$251	$256.41	$262
Permanent Trench Pavement Repair	20	S.Y.	$60	$1,200	$1,206	$1,230.77	$1,255
Traffic Control	1	L.S.	$2,000	$2,000	$2,010	$2,051.28	$2,092
Site Prep and Miscellaneous (8%)	1	L.S.	$11,172	$11,172	$11,230	$11,458.87	$11,688
Contingency (10%)	1	L.S.	$15,083	$15,083	$15,160	$15,469.48	$15,779
Contractor's Bonds (2%)	1	L.S.	$3,318	$3,318	$3,335	$3,403.28	$3,471
			Subtotal	**$169,228**	**$170,096**	**$173,568**	**$177,039**
			USE	**$170,000**	**$171,000**	**$174,000**	**$178,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-8

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond

West Main Street- Access Road with Water & Sewer Extensions

Scoping Study

Phase II: 3" Low Pressure Grinder Pump Forcemain- Reap Property to Gateway District Boundary

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
3" HDPE LPS	1,600	L.F.	$42	$67,200	$67,545	$68,923.08	$70,301.54
5' Diameter Air Release Manhole	1	EA.	$8,000	$8,000	$8,041	$8,205.13	$8,369.23
5' Diameter Cleanout Manhole	1	EA.	$8,000	$8,000	$8,041	$8,205.13	$8,369.23
1 1/2" LPS Service	110	L.F.	$35	$3,850	$3,870	$3,948.72	$4,027.69
1 1/2" Curb Stops and Boxes	11	EA.	$250	$2,750	$2,764	$2,820.51	$2,876.92
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564.10	$2,615.38
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,230.77	$1,255.38
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410.26	$6,538.46
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641.03	$1,673.85
Boulder Excavation	10	C.Y.	$50	$500	$503	$512.82	$523.08
Erosion Control	1	L.S.	$2,500	$2,500	$2,513	$2,564.10	$2,615.38
Dust Control	1	Ton	$500	$250	$251	$256.41	$261.54
Permanent Trench Pavement Repair	0	S.Y.	$60	$0	$0	$0.00	$0.00
Traffic Control	1	L.S.	$10,000	$10,000	$10,051	$10,256.41	$10,461.54
Site Prep and Miscellaneous (8%)	1	L.S.	$9,168	$9,168	$9,215	$9,403.08	$9,591.14
Contingency (10%)	1	L.S.	$12,377	$12,377	$12,440	$12,694.15	$12,948.04
Contractor's Bonds (2%)	1	L.S.	$2,723	$2,723	$2,737	$2,792.71	$2,848.57
			Subtotal	**$138,868**	**$139,580**	**$142,428**	**$145,277**
			USE	**$139,000**	**$140,000**	**$143,000**	**$146,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-9

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Phase 3- 3" Gateway District Boundary to River View Commons Mobile Home Park

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
3" HDPE LPS	4,150	L.F.	$42	$174,300	$175,194	$178,769	$182,345
16" Jack & Bore Steel Sleeves	350	L.F.	$500	$175,000	$175,897	$179,487	$183,077
5' Diameter Air Release Manhole	2	EA.	$8,000	$16,000	$16,082	$16,410	$16,738
5' Diameter Cleanout Manhole	2	EA.	$8,000	$16,000	$16,082	$16,410	$16,738
3" LPS Service	30	L.F.	$42	$1,260	$1,266	$1,292	$1,318
3" Curb Stops and Boxes	1	EA.	$500	$500	$503	$513	$523
1 1/2" LPS Service	30	L.F.	$35	$1,050	$1,055	$1,077	$1,098
1 1/2" Curb Stops and Boxes	3	EA.	$250	$750	$754	$769	$785
Class "B" Concrete	10	C.Y.	$250	$2,500	$2,513	$2,564	$2,615
Miscellaneous Extra Excavation	50	C.Y.	$24	$1,200	$1,206	$1,231	$1,255
Below-Grade Rock Removal (pipelines)	50	C.Y.	$125	$6,250	$6,282	$6,410	$6,538
Replacement of Unsuitable Material	50	C.Y.	$32	$1,600	$1,608	$1,641	$1,674
Boulder Excavation	10	C.Y.	$50	$500	$503	$513	$523
Erosion Control	1	L.S.	$2,500	$2,500	$2,513	$2,564	$2,615
Dust Control	5	Ton	$500	$2,500	$2,513	$2,564	$2,615
Permanent Trench Pavement Repair	0	S.Y.	$60	$0	$0	$0	$0
Traffic Control	1	L.S.	$30,000	$30,000	$30,154	$30,769	$31,385
Site Prep and Miscellaneous (8%)	1	L.S.	$34,553	$34,553	$34,730	$35,439	$36,148
Contingency (10%)	1	L.S.	$46,646	$46,646	$46,885	$47,842	$48,799
Contractor's Bonds (2%)	1	L.S.	$10,262	$10,262	$10,315	$10,525	$10,736
			Subtotal	**$523,371**	**$526,055**	**$536,791**	**$547,527**
			USE	**$524,000**	**$527,000**	**$537,000**	**$548,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-10

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Upgraded Middle School Pump Station (Wet Well and Emergency Storage)

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
EMERGENCY ACCESS ROAD							
Demo Existing 4' Diameter Wetwell	1	LS	$4,000	$4,000	$4,021	$4,103	$4,185
New 8' Diameter Wet Well	1	EA.	$15,000	$15,000	$15,077	$15,385	$15,692
New 6,000 Gallon Emergency Storage Tank	1	EA.	$15,000	$15,000	$15,077	$15,385	$15,692
New Electrical Service	1	L.S.	$15,000	$15,000	$15,077	$15,385	$15,692
8" PVC Sewerline	40	L.F.	$80	$3,200	$3,216	$3,282	$3,348
Topsoil	30	C.Y.	$25	$750	$754	$769	$785
Seeding, Fertilizer and Liming	0.5	Acre	$1,000	$500	$503	$513	$523
Mulching	0.5	Acre	$1,000	$500	$503	$513	$523
Silt Fence	100	L.F.	$4	$350	$352	$359	$366
Site Prep and Miscellaneous (8%)	1	L.S.	$4,344	$4,344	$4,366	$4,455	$4,544
Contingency (10%)	1	L.S.	$5,864	$5,864	$5,894	$6,015	$6,135
Contractor's Bonds (2%)	1	L.S.	$1,290	$1,290	$1,297	$1,323	$1,350
			Subtotal	**$65,799**	**$66,136**	**$67,486**	**$68,835**
			USE	**$66,000**	**$67,000**	**$68,000**	**$69,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-11

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
Upgraded Middle School Pump Station (Wet Well and Emergency Storage)

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
EMERGENCY ACCESS ROAD							
Demo Existing 4' Diameter Wetwell	1	LS	$4,000	$4,000	$4,021	$4,103	$4,185
New 8' Diameter Wet Well	1	EA.	$15,000	$15,000	$15,077	$15,385	$15,692
New Emergency Generator	1	EA.	$30,000	$30,000	$30,154	$30,769	$31,385
New Electrical Service	1	L.S.	$12,000	$12,000	$12,062	$12,308	$12,554
8" PVC Sewerline	30	L.F.	$80	$2,400	$2,412	$2,462	$2,511
Topsoil	20	C.Y.	$25	$500	$503	$513	$523
Seeding, Fertilizer and Liming	0.5	Acre	$1,000	$500	$503	$513	$523
Mulching	0.5	Acre	$1,000	$500	$503	$513	$523
Silt Fence	100	L.F.	$4	$350	$352	$359	$366
Site Prep and Miscellaneous (8%)	1	L.S.	$5,220	$5,220	$5,247	$5,354	$5,461
Contingency (10%)	1	L.S.	$7,047	$7,047	$7,083	$7,228	$7,372
Contractor's Bonds (2%)	1	L.S.	$1,550	$1,550	$1,558	$1,590	$1,622
			Subtotal	**$79,067**	**$79,473**	**$81,095**	**$82,717**
			USE	**$80,000**	**$80,000**	**$82,000**	**$83,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

TABLE C-12

OPINION OF PROBABLE CONSTRUCTION COST

Town of Richmond
West Main Street- Access Road with Water & Sewer Extensions
Scoping Study
3" Low Pressure Grinder Pump Forcemain Parallel School's Forcemain

Description	Quantity	Units	ENR 9,750 2014 Unit Price	ENR 9,750 2014 Total Cost	ENR 9,800 2015 Total Cost	ENR 10,000 2016 Total Cost	ENR 10,200 2017 Total Cost
WASTEWATER SYSTEM							
3" HDPE LPS	1,200	L.F.	$42	$50,400	$50,658	$51,692.31	$52,726.15
Core Manhole	1	L.S.	$1,500	$1,500	$1,508	$1,538.46	$1,569.23
Permanent Trench Pavement Repair	6	S.Y.	$60	$360	$362	$369.23	$376.62
Traffic Control	1	L.S.	$1,500	$1,500	$1,508	$1,538.46	$1,569.23
Site Prep and Miscellaneous (8%)	1	L.S.	$4,301	$4,301	$4,323	$4,411.08	$4,499.30
Contingency (10%)	1	L.S.	$5,806	$5,806	$5,836	$5,954.95	$6,074.05
Contractor's Bonds (2%)	1	L.S.	$1,277	$1,277	$1,284	$1,310.09	$1,336.29
			Subtotal	**$65,144**	**$65,478**	**$66,815**	**$68,151**
			USE	**$66,000**	**$66,000**	**$67,000**	**$69,000**

Notes:

1. The construction cost estimates are based on preliminary phase estimates only. More detailed costs shall be developed during Final Design Phase Engineering based on actual design quantities.
2. ENR= Engineering News Record Construction Cost Index.

APPENDIX D

STUDY AREA FEES, RATES AND REVENUE ANALYSES

Table D-1

Phase I Only

Richmond Water/Sewer Expansion: Study Area Fees, Rates and Revenue Analysis
12/31/2014

$277,000		**Estimated Phase I Water Total Project Cost (ENR 9800, 2015)**
$220,000		**Estimated Phase I Sewer Total Project Cost (ENR 9800, 2015)**
$497,000	(1,4)	**Estimated Phase I Water/Sewer Total Project Cost (ENR 9800, 2015)**
$1,341		Water Hookup Fees ($150 inspection fee + $1.89 /gal= $150 + $1.89(630) = $1,340.70)
$2,928		Sewer Hookup Fees ($150 inspection fee + $4.41 /gal= $150 + $4.41(630) = $2,928.30)
$194,025	(3)	**Estimated Water Capital Contributions (Developer(s), Town and/or others)**
$194,025	(3)	**Estimated Sewer Capital Contributions (Developer(s), Town and/or others)**
$81,634		**Balance of Estimated Water Total Project Cost**
$23,047		**Balance of Estimated Sewer Total Project Cost**
$104,681	=	**Balance of Estimated Water/Sewer Total Project Cost**
$4,722		*Est. Annual Water Loan Payments: 4% for 30 years or $57.84 per year per $1000*
$1,408		*Est. Annual Sewer Loan Payments: CWSRF 2% for 20 years or $61.10 per year per $1000*
$6,130		**Estimated total new annual water/sewer loan payments**
$6,130	-	**Estimated new annual revenue from new users**
($0)	=	**Estimated total rate increase/decrease for all current users**
($0.00)	=	**Estimated average annual rate w+s increase/decrease per current user (<20 years)**
	(2)	*Estimated current number users = 474*

Notes

1. Does not include or address cost of new road from school
2. Estimates are for existing users or structures only and does not include any additional hook-up fees or revenues from development.
3. Developer $ contributions and details tbd; may need legal advice/direction
4. Does not include cost for work on private property (i.e. water services/water meters/sewer service and grinder pumps). Average cost for water work on private property is approximately $4,000. Costs for sewer work on private property cost range from $7,000 to $14,000 depending on property specifics.

Table D-2

Phase I and Phase II Only

Richmond Water/Sewer Expansion: Study Area Fees, Rates and Revenue Analysis
12/31/2014

$629,000		**Estimated Phase I and II Water Total Project Cost (ENR 9800, 2015)**
$393,000		**Estimated Phase I and II Sewer Total Project Cost (ENR 9800, 2015)**
$1,022,000	(1,4)	**Estimated Phase I and II Water/Sewer Total Project Cost (ENR 9800, 2015)**
$14,286		Water Hookup Fees ($150 inspection fee + $1.89 /gal= $150 (10) + $1.89(6,765) = $14,286)
$21,808		Sewer Hookup Fees ($150 inspection fee + $4.41 /gal= $150 (10) + $4.41(4,605) = $21,808)
$159,850	3	**Estimated Water Capital Contributions (Developer(s), Town and/or others)**
$159,850	3	**Estimated Sewer Capital Contributions (Developer(s), Town and/or others)**
$454,864		**Balance of Estimated Water Total Project Cost**
$211,342		**Balance of Estimated Sewer Total Project Cost**
$666,206	=	**Balance of Estimated Water/Sewer Total Project Cost**
$26,309		*Est. Annual Water Loan Payments: 4% for 30 years or $57.84 per year per $1000*
$12,913		*Est. Annual Sewer Loan Payments: CWSRF 2% for 20 years or $61.10 per year per $1000*
$39,222		**Estimated total new annual water/sewer loan payments**
$39,223	-	**Estimated new annual revenue from new users**
($1)	=	**Estimated total rate increase/decrease for all current users**
($0.00)	=	**Estimated average annual rate w+s increase/decrease per current user (<20 years)**
	(2)	*Estimated current number users = 491*

Notes

1. Does not include or address cost of new road from school
2. Estimates are for existing users or structures only and do not include any additional hook-up fees or revenues from development.
3. Developer $ contributions and details tbd; may need legal advice/direction
4. Does not include cost for work on private property (i.e. water services/water meters/sewer service and grinder pumps). Average cost for water work on private property is approximately $4,000. Costs for sewer work on private property cost range from $7,000 to $14,000 depending on property specifics.

Table D-3
Phase I, II and III Water & Sewer Complete

Richmond Water/Sewer Expansion: Study Area Fees, Rates and Revenue Analysis

12/31/2014

$1,479,000		**Estimated Phase I, and II Water Total Project Cost (ENR 9800, 2015)**
$1,029,000		**Estimated Phase I, II and III Sewer Total Project Cost (ENR 9800, 2015)**
$2,508,000	(1,4)	**Estimated Phase I and II Water/Sewer Total Project Cost (ENR 9800, 2015)**
$88,142		Water Hookup Fees ($150 inspection fee + $1.89 /gal= $150 (14) + $1.89(45,525) = $88,142)
$167,232		Sewer Hookup Fees ($150 inspection fee + $4.41 /gal= $150 (14) + $4.41(37,445) = $167,232)
$0	(3)	**Estimated Water Captital Contributions (Developer(s), Town and/or others)**
$0	(3)	**Estimated Sewer Captital Contributions (Developer(s), Town and/or others)**
$1,390,858		**Balance of Estimated Water Total Project Cost**
$861,768		**Balance of Estimated Sewer Total Project Cost**
$2,252,625	=	**Balance of Estimated Water/Sewer Total Project Cost**
$80,447		*Est. Annual Water Loan Payments: 4% for 30 years or $57.84 per year per $1000*
$52,654		*Est. Annual Sewer Loan Payments: CWSRF 2% for 20 years or $61.10 per year per $1000*
$133,101		**Estimated total new annual water/sewer loan payments**
$123,493		**Estimated new annual water revenue from new users**
$5,100		**Estimated Additional Water O&M Cost**
$166,624		**Estimated new annual sewer revenue from new users**
$290,117	-	**Estimated total new annual revenue from new users**
$17,800		**Estimated Additional Sewer O&M Cost**
($37,946)		**Estimated total Average water rate increase/decrease for ALL USERS**
($59.11)		**Estimated average annual water rate w+s increase/decrease for ALL USERS (<30 years)**
($96,170)		**Estimated total Average sewer rate increase/decrease for ALL USERS**
($149.80)		**Estimated average annual sewer rate w+s increase/decrease for ALL USERS (<20 years)**
	(2)	*Estimated Total Number Water Users = 642*
	(2)	*Estimated Total Number Sewer Users = 642*

Notes

1. Does not include or address cost of new road from school
2. Estimates are for existing users or structures only and do not include any additional hook-up fees or revenues from development.
3. Developer $ contributions and details tbd; may need legal advice/direction
4. Does not include cost for work on private property (i.e. water services/water meters/sewer service and grinder pumps). Average cost for water work on private property is approximately $4,000. Costs for sewer work on private property cost range from $7,000 to $14,000 depending on property specifics. Mobile home park will be higher.

APPENDIX E

Project Schedule

Green Mountain Engineering, Inc.

Project Schedule

West Main Street Phase I, II and III – Water and Sewer Extensions

Project Milestone	Complete by:
Complete Scoping Study	December 31, 2014
Complete Topographic Survey	January, 2015
Determine Project bonding amount and plan for Vote	January 15, 2015
Preliminary Engineering & Income Survey Contract Awards	January 15, 2015
Complete Preliminary Engineering and Income Survey	February 6, 2015
Bond Vote	March 3, 2015
Final Design Engineering Contract Award	March 15, 2015
Preliminary Design and Opinion of Probable Construction Cost	July 15, 2015
Obtain commitments from landowners	July 15, 2015
Complete Review Meetings	August 15, 2015
Local approval of Plans and Specs	August 15, 2015
Submit for AOT review and permits	August 15, 2015
Obtain AOT Permit	September 15, 2015
Submit for State Erosion Control, Water and Wastewater Permits	October 15, 2015
Submit For Act 250 Permit	November 15, 2015
Obtain State Act 250 and Water/Wastewater Permit	January 15, 2016
Advertise for Bids	February 15, 2016
Start Construction	April 1, 2016
Complete Construction	October 15, 2017