November, 2009

Town of Richmond, Vermont

Environmental Information Document For Proposed Projects: Millet-Tilden Stormwater Upgrade & Primary Sanitary Improvements State Project No. AR1-057

GME Project No. 19-002

Prepared for:

Town of Richmond
P.O. Box 285
Richmond, VT 05477
(802) 434-5170

Prepared by:

Green Mountain Engineering, Inc.
1438 S. Brownell Road
Williston, VT 05495
(802) 862-5590

TOWN OF RICHMOND, VERMONT
ENVIRONMENTAL INFORMATION REPORT

November 2009

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EXHIBITS

A. Project Introduction

1.1 Project Description

The Town of Richmond seeks to undertake two projects: the Millet Street Stormwater Upgrade and the Richmond Village Primary Sanitary Improvements project. The Millet Street Stormwater Upgrade project entails the interception of two stormwater flows and rerouting them through a new conveyance line down to the existing connection to the remainder of the village stormwater system. The Village Sanitary Improvements project entails the addition of approximately twelve to fifteen new sanitary manholes, four thousand linear feet of cured-in-place pipe retrofit lining along sections of the existing sanitary sewer lines, and the repair of five dilapidated drop-manholes. Aside from these maintenance tasks, these projects will not entail any new land development. There will be no increase of stormwater runoff as a result of this project – no new impervious areas are included as part of this plan. The proposed stormwater conveyance will connect to the existing/historic outlet and will not affect stormwater quality or volumes as such.

Although part of a greater plan encompassing nine projects, this EID only addresses the two abovementioned projects; an EID report which encompasses the remaining seven projects will be submitted at a later time. It is the Town's intention to submit the two reports separately in order to accommodate an expedited schedule for the two initial projects.

1.2 Purpose and Need

Purpose and Need for the two projects are described as follows:

Millet Street Stormwater Upgrade

The existing stormwater system along Millet and Tilden Streets is composed of various antiquated materials (including a laid-stone masonry box-culvert). Aside from being out-of-date and under questionable condition, the main problem associated with this line is that it lies almost entirely within private land. By intercepting the flows at two locations on Tilden Street and constructing a new

storm pipe within road right-of-ways, the Town will be taking essential steps to avoid a problematic future system failure.

Richmond Village Primary Sanitary Improvements

The existing sanitary system within the Village of Richmond is outdated and in need of repair. The aging clay sewer lines currently in use have several deficiencies including poor seals and connections (resulting in a large amount of infiltration) and long pipe runs without access for inspection or maintenance. One stretch of sewer line along Bridge Street, for instance, has a run of approximately 1,500 linear feet without a manhole. The purpose of this project is to provide access along those existing lines in order to inspect and properly maintain them. The project will also encompass the lining of pipe segments which are in particularly poor condition via the Cured-In-Place Pipe (CIPP) process. The CIPP procedure yields a "pipe-within-a-pipe," so to speak, by creating a seamless, epoxy-formed tube pipe which is formed and cured tight against the interior of the existing sewer pipe. The resulting pipe not only completely eliminates infiltration and improves hydraulic characteristics, it also provides a long-term stand-alone system capable of supporting all structural loads once the existing (receiving) pipe fails. CIPP pipe lining is a trenchless procedure.

By adding several access points and improving the quality of the existing sewer lines, the Town of Richmond will be ready for increased demand for many years to come.

2.0 Alternatives to the Proposed Project

2.1 Description of Alternatives Considered

Millet Street Stormwater Upgrade

Three alternatives were investigated for the Millet Street Stormwater Upgrade. The first alternative is the do-nothing option – the existing line will maintain its current location and materials. The second alternative would be to replace the existing lines with new materials in their existing locations, and alternative 3 involves the lining of the existing storm line with a cured-in-place pipe, where possible. It's unlikely that the stone box-culvert can be lined, but the majority of the clay pipes would likely accept the process.

Richmond Village Sanitary Improvements

Two alternatives were considered for this project. The first alternative is the do-nothing plan – no new manholes would be added, no linings, and the line will remain as is. The second alternative is to replace the lines in question with a traditional line replacement with trench excavations, new manholes, and pipe removal and replacement (creating an entirely new line).

2.2 Impact of Alternatives Considered

Millet Street Stormwater Upgrade

Despite not imparting any immediate environmental or financial impacts to the Town, the passing of time associated with the do-nothing plan will inevitably cause a slow, progressive breakdown of the existing pipe materials. The storm-line will at some point fail. If it fails at its current location on private land, the necessary access to repair the line will be difficult, not to mention the financial problems of executing the repairs. The end result of doing nothing will lead to a scabbed system of point reparations between old pipe segments. The repairs will be expensive over time and localized flooding when the line fails during heavy rain events will occur. This alternative is a poor option.

Alternative 2 would effectively solve the problem of the aging line and significantly delay the potential for a system failure, yet the main problem of the line being on private land would still exist. There would likely be legal and financial issues related to securing permanent access easements in the private properties. Line maintenance would be much less intrusive if it were located along the roadways – placing a new line in the existing line's location would be a situation to be avoided.

Despite assumedly being more cost-effective than alternative 2, alternative 3 still results in the same main problems associated with maintaining the existing pipe's location and is not recommended.

Richmond Village Sanitary Improvements

The do-nothing alternative on the Sanitary Improvements project yields similar results as the do-nothing alternative in the Millet Stormwater project. Financial

and environmental costs would be greater in the long-run as repairs come up from clogs and system failures. It is likely that sanitary-system use will progressively increase as time goes on, putting a higher demand on the existing infrastructure. According to the Town of Richmond's 2007 Town Plan, Richmond has experienced a 4% population growth over recent years. Most new residents, however, follow a trend of moving to the more rural sections of town and not connecting to the village infrastructure. Increased village populations are to be expected, nevertheless. Combining higher future flows with the existing groundwater infiltration volumes would increase demand at the wastewater treatment plant, potentially surpassing plant capacity. This alternative does nothing to address an inefficient, old system in need of repair. The health of the village community would suffer as a result of this option.

Alternative 2, completely replacing the existing infrastructure in question, would yield a quality product that would serve the Town on a long-term basis with minimal maintenance. As a standard removal-and-replacement job, however, this alternative would present greater traffic disruption and higher construction costs and is thus less cost-effective than the recommended solution.

2.3 Conclusions

The primary goal of the Millet Street Stormwater Upgrade project is line relocation such that the stormwater conveyance is within street right-of-ways. In order to accomplish this, an entirely new pipeline must be constructed down Tilden and Millet Streets. Based on this consideration, none of the alternatives qualify as feasible options; constructing a new line along Millet Street and Tilden Avenue is the best practical solution.

Action is required on the Richmond Village Sanitary Improvements project – a do nothing approach is unacceptable. Out of the two feasible options (line replacement and existing line rehabilitation), line rehabilitation via new manholes and the lining of the existing line is the most cost-effective. It also presents both the least amount of impact to the environment by avoiding a large amount of excavation and minimal social disturbance with less construction time required.

3.0 Affected Environmental Resources

Please see the two-page Exhibit A regarding the layout of the Town of Richmond (including the existing sanitary and stormwater lines as pertinent) for reference. The areas of contract limits with rough estimates of disturbed (excavation) areas are also shown.

Gilman & Briggs Environmental has executed an environmental study of the areas to be impacted by these two projects, as well as the remaining 7 projects of the Richmond Infrastructure Upgrade. It is attached as Exhibit B for reference.

The environmental impacts of the proposed projects are outlined and discussed as follows:

Direct Impacts

3.1 Air Quality

The proposed projects will not have any air quality impacts aside from those associated with normal and customary construction.

3.2 Water Quality and Quantity

The existing water quality will remain unchanged as a result of these projects. As mentioned above, no additional impervious areas are proposed in the Millet Street Stormwater project – both the water quality and total volume of stormwater runoff will be equal to the existing conditions. The proposed tie-in location to the existing stormwater system will match the existing. Considering that there will be no increase in stormwater runoff volume, the Vermont Stormwater Section of the Water Quality Division has waived the need for a stormwater discharge permit for the Millet Street Stormwater Upgrade project.

No stormwater systems or conveyances will be impacted by the Sanitary Improvements project. However, by sealing the existing sanitary pipes with new CIP seamless pipes, it can be assumed that groundwater quality along the lengths of pipes to be lined will improve as no sanitary water will escape the pipe.

3.3 Environmentally Sensitive Areas

Exhibit C details the floodplain in the Richmond area. Two manholes will be installed within the outskirts of the 100-year floodplain along Esplanade Street. They will be installed along the existing sanitary line in that street and will not be constructed such that their rims will match the existing grades, resulting in no change to the floodplain elevations.

Exhibit D details wetlands in the Richmond area. The project boundaries will not enter or encroach any of the wetlands shown; no wetlands will be impacted by these projects.

Prime Agricultural Land will be unaffected as the two projects will take place entirely within the residential town of Richmond and almost entirely under existing roads.

Exhibit E details state-recognized fish and wildlife habitats and threatened and endangered species resources in the Richmond area. Although several areas delineated as habitats/resources are located nearby, the Richmond projects will not take place in those regions and no adverse impact is expected.

No stream modification is included in this project.

An USACE 404-10 Evaluation is unnecessary for this project as the proposed work does not occur in wetlands.

3.4 Socioeconomic Impacts

The proposed projects are not expected to have any significant socioeconomic impacts. A significant portion of the funding for these projects is hoped to be secured through the American Recovery and Reinvestment Act (ARRA) stimulus funding and will provide the best available funding opportunity. These projects are recommended courses of action for the Town based on the "*Richmond Subsurface Planning Study*", dated August 2005. Based on an updated quantities analysis and cost estimate, the current preliminary engineer's estimates are as follows:

Construction Costs: Millet Stormwater	$198,330
Construction Costs: Sanitary Improvements	$346,446

Assuming preliminary, final, bidding, and construction engineering costs to total approximately $149,800 with archeological and environmental expenses being a further $12,500, the preliminary expected total combined-projects cost is $707,076.

3.5 Historical/Archeological Sites and National Landmarks

Exhibit F provides a complete Site Visit Letter submitted by Hartgen Archeological Associates, Inc., in regards to the proposed project boundaries and surroundings. After an on-site investigation, Hartgen has identified one area which warrants further investigation and/or Phase IB. Please see the attached report for more details.

A few areas that the project will include if landowner easements for access to private land are approved have not been included in the report. An additional archeological report discussing these areas will be submitted should the areas in question become available.

3.6 Wild and Scenic Rivers

After reconnecting with the existing storm drain system and progressing south of town, the Millet Street stormwater system eventually empties into a swale leading into the Winooski River. As mentioned previously, there will be no change to the existing stormwater volumes or quality; no impact to the river is expected. No wild and scenic rivers will be impacted by this project.

Indirect Impacts

3.7 The current population of the Town of Richmond, according to the 2000 census, is approximately 4,090 people. Richmond is a growing community, but most newcomers to the Town reside outside of the village boundaries in more rural settings. The rate of population growth within the village can likely be estimated at around 2% (annual). Significant changes in either land use or population is unlikely over the next 25 years, especially for the areas these projects concern (a developed residential area). Minimal amounts of new impervious area are expected within the storm basin, and the existing sanitary infrastructure is expected to be capable of the foreseeable increase in system demand.

4.0 Mitigation of Environmental Impacts

No impacts to the existing system or environment are proposed or expected. If anything, the increased seal within the sanitary sewers should help to correct any existing sanitary leaks into the ground around the pipes and eliminate a slight environmental issue. The Town of Richmond's administration and utility departments will continue to be responsible for the upkeep and monitoring of the sanitary and stormwater sewer systems.

5.0 Summary of Agency and Public Consultation

The first of two public meetings was held on October 16th – the second is scheduled for November 16th. There have been no public objections to the project thus far. It can be assumed, however, that there will be some concerns about construction in Town disrupting the daily lives of the residents, but aside from standard noise and traffic delays, no major objections are expected. The Town of Richmond is scheduled to have their bond vote on November 24th. The bond vote will be for the amount of $750,000.

6.0 List of Agencies Consulted

The two agencies consulted in the process of this project thus far are the Vermont Stormwater Section of the Water Quality Division (with regard to a stormwater discharge permit) and the Facilities Engineering Division (concerning project funding). Based on conversations with the Water Quality Division, a stormwater discharge permit may be unnecessary as no changes to the existing water volumes or quality are proposed.

Preparer's Signature:

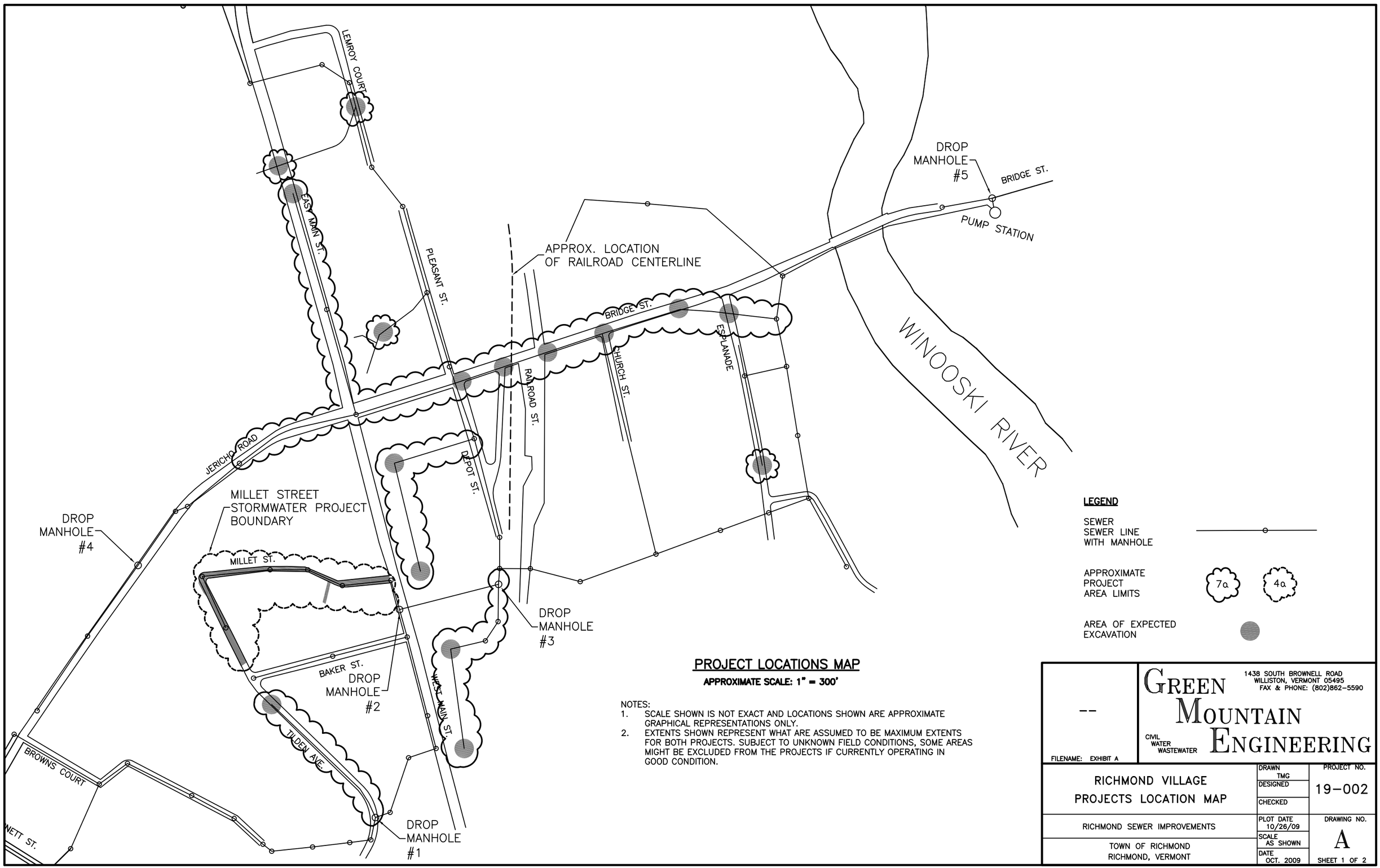
Tyler Gingras, EI

Green Mountain Engineering

November 2, 2009

EXHIBIT A

RICHMOND PROJECT LOCATIONS MAP
AND
MILLET ST. STORMWATER UPGRADE MAP



PROJECT LOCATIONS MAP

APPROXIMATE SCALE: 1" = 300'

NOTES:
1. SCALE SHOWN IS NOT EXACT AND LOCATIONS SHOWN ARE APPROXIMATE GRAPHICAL REPRESENTATIONS ONLY.
2. EXTENTS SHOWN REPRESENT WHAT ARE ASSUMED TO BE MAXIMUM EXTENTS FOR BOTH PROJECTS. SUBJECT TO UNKNOWN FIELD CONDITIONS, SOME AREAS MIGHT BE EXCLUDED FROM THE PROJECTS IF CURRENTLY OPERATING IN GOOD CONDITION.

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FILENAME: EXHIBIT A

GREEN MOUNTAIN ENGINEERING
CIVIL WATER WASTEWATER
1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
FAX & PHONE: (802)862-5590

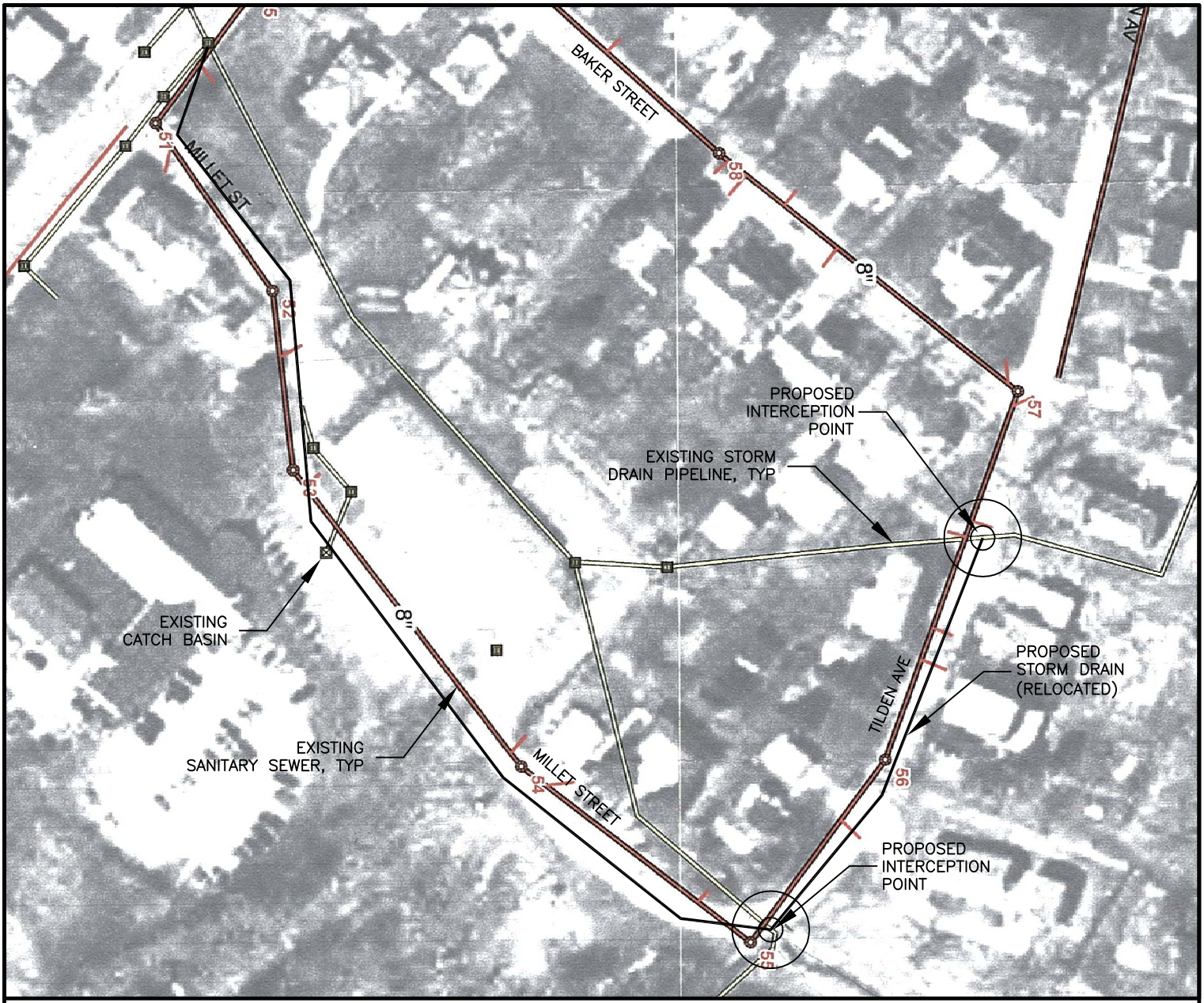
RICHMOND VILLAGE
PROJECTS LOCATION MAP

RICHMOND SEWER IMPROVEMENTS

TOWN OF RICHMOND
RICHMOND, VERMONT

DRAWN	TMG
DESIGNED	
CHECKED	
PROJECT NO.	19-002
PLOT DATE	10/26/09
SCALE	AS SHOWN
DATE	OCT. 2009
DRAWING NO.	A
SHEET	1 OF 2

S:\GME Project Files\19-000\19-002 Richmond Village Infrastructure Rehabilitation\Documents\Environmental & Archeological\EID-4a_&_7a\p1 Exhibit a.dwg, 10/26/2009 11:08:00 AM



EXISTING CONDITIONS

NO SCALE

NOTE:
1. CONDITIONS SHOWN FROM SUBSURFACE STUDY BY GREEN MOUNTAIN ENGINEERING SHOW CONDITIONS FOUND IN THE STUDY. NOT ALL INFRASTRUCTURE PRESENT IS SHOWN.
2. PROPOSED CONDITIONS SHOWN ARE FOR GRAPHICAL PURPOSES ONLY – EXTENTS AND LOCATIONS OF LINES SUBJECT TO CHANGE DURING DESIGN.

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FILENAME: MH DETAILS

GREEN MOUNTAIN ENGINEERING
CIVIL
WATER
WASTEWATER
1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
FAX & PHONE: (802)862-5590

MILLET STREET
STORMWATER UPGRADE MAP

RICHMOND SEWER IMPROVEMENTS

TOWN OF RICHMOND
RICHMOND, VERMONT

DRAWN: TMG
DESIGNED:
CHECKED:
PROJECT NO.: 19-002
PLOT DATE: 10/21/09
SCALE: AS SHOWN
DATE: OCT. 2009
DRAWING NO.: A
SHEET 2 OF 2

EXHIBIT B

GILMAN & BRIGGS
ENVIRONMENTAL REPORT

Gilman & Briggs Environmental
1 Conti Circle, Suite 5
Barre, Vermont 05641
TEL: (802) 479-7480; FAX: (802) 476-7018
gbenvironmental@earthlink.net

7 October 2009

Tyler Gingras
Green Mountain Engineering
1428 South Brownell Road
Williston, VT 05495

Subject: Richmond Infrastructure

Dear Mr. GIngras,

On 2 October, I performed field investigations on the areas depicted on Sheet 1, "Comprehensive Project Areas" for Richmond Sewer Improvements. Specific areas of interest included wetlands, streams, rare, threatened or endangered species and rare and irreplaceable natural areas. An assessment, by areas, is given below.

Cochran Road. Two intermittent streams were identified along Cochran Road, the first about 925 feet from the intersection of Bridge Street. This drains from the south along a woodline, flows through a culvert and then turns sharply to the east paralleling the street in a deeply incised ditch before flowing through fields to the river. On the south side of the road, there is a strip about 3.5 feet wide between the culvert opening and the pavement, while the strip on the north is about 4 feet wide. There is a depression between the pavement and culvert on the north side, the result of either subsidence or erosion, but shoulders on both sides are fully vegetated with grass and weedy species.

A small area of wetland, dominated by reed canary grass (*Phalaris arundinacea*) and jewelweed (*Impatiens capensis*) occurs beside the stream on the south side of the road, but is far enough from the road that work within the footprint of the road will have no impacts.

The second intermittent stream is located ca. 1900 feet from the Bridge Street intersection. This stream flows from the south in a deep channel, passes through a culvert and then flows in an even deeper channel toward the river. Concrete headwalls armor the areas at the culvert ends, and both shoulders are well vegetated and maintained as lawn. The vegetated shoulder between the road and headwall on the south side ranges from about 4 to 8 feet in width, and on the south the strip ranges from 10 to 15 feet wide.

A sheep pasture between Cochran Road and the river is mostly on Winooski very fine sandy loam and Hadley very fine sandy loam, both non-hydric soil types, although there appear to be depressions supporting wetland vegetation. However, these depressions are well separated from the road by a 50 to 60-foot slope.

Soils regarded as Prime Agricultural Soils occur throughout the length of the Cochran Road section. Agawam fine sandy loam is mapped from the Bridge Street intersection to a point about 650 feet to the east, and from the cemetery to a point about 1300 feet to the west. The area between has been mapped as Winooski very fine sandy loam, also a Prime Agricultural Soil. The characteristics of these soil types no longer apply to the footprint of Cochran Road and its shoulders, and no impacts are anticipated as long as construction remains in the right-of-way.

Bridge Street, Esplanade, Railroad Street, Depot Street and Pleasant Street. With the exception of a short section near the bridge, these streets are entirely lined with commercial, industrial, residential, religious or municipal development. No environmental constraints were noted in this area, although a Class Two wetland has been identified on the right bank upstream of the bridge. The actual extent of the wetland may bring the wetland's 50-foot buffer zone into the project area, but because it is anticipated that the project will occur within the existing footprint of the public way, and because reconstruction of existing facilities is an allowed use under the Vermont Wetland Rules, no Conditional Use Determination should be required.

The undeveloped section next to the bridge has been mapped in the Chittenden County Soil Survey as Hadley very fine sandy loam, frequently flooded, a Prime Agricultural Soil in Vermont. However, as is described above, no impacts are anticipated to lands off the disturbed areas at the approaches to the bridge.

East Main Street and Lemroy Court. East Main Street is entirely developed with commercial and residential structures, and an industrial facility occupies the area between East Main Street and Lemroy Court. Soils in this area are mapped as Duane and Deerfield 0 to 5% slopes, a soil of Statewide importance for agriculture, but are occupied by industrial uses and adjacent landscaped land. A steep forested slope flanks Lemroy Court to the south, dropping to a floodplain forest of cottonwoods (*Populus deltoides*) and boxelder (*Acer negundo*) north of the railroad tracks. At its closest, the street is separated by a strip of t 8 to 10 feet between the pavement and the top of bank. No environmental constraints were identified in this area of Richmond.

West Main Street, Millet Tilden and Baker Streets. The only "natural" section along these streets is at the corner of Millet and Tilden Streets where a small stream flows off the hillside to the north and disappears under the street. The stream flows in a deep channel with vegetation characterized by reed canary-grass, jewelweed, hog-peanut (*Amphicarpaea bracteata*) and riverbank grape (*Vitis riparia*), flanked on the streambanks by staghorn sumac (*Rhus typhina*), butternut (*Juglans cinerea*) and boxelder over Canada goldenrod (*Solidago canadensis*) and other weedy herbs.

An undeveloped area of Duane & Deerfield soils, 5 to 12% slope, occurs on either side of this stream. This soil type is ranked of Statewide importance as an agricultural soil, and, in fact, there is a garden plot on the east side of the stream.

The remainder of these streets is flanked by developed and landscaped parcels.

Jericho Road. This road passes through a flat section, fully developed, near the intersection with Route 2, and then rises toward School Street and Interstate 89. Developable land along the upper part of the street is built upon, the remaining areas are either steep wooded slopes or ledges.

The road crosses an intermittent stream just south of Burnett Court. The stream is in a high gradient channel off the hillside to the east, and the culvert entrance lies about 8 feet below the level of the road surface. On the west side of the road, the stream daylights at the toe of a 20 foot embankment.

Although there are short sections along Jericho Road mapped as either Prime Agricultural Soils (Agawam fine sandy loam, 0 to 5% slopes near School Street and Belgrade and Eldridge soils, 0 to 3% slopes just downhill) and Statewide Agricultural Soils (Duane and Deerfield soils, 0 to 5% and 5 to 12% slopes at the bottom of the hill), level areas are almost entirely developed, and the remaining sections are either cut and fill slope or wooded ledges.

Summary. In summary, there are few environmental constraints in the areas of interest identified on Drawing 1, Comprehensive Project Areas.

Surface waters include the Winooski River and four intermittent streams (2 on Cochran Road, one at the corner of Millet Street and Tilden Avenue, and one on Jericho Road just south of Burnett Court. None of these should be affected by work within the roadways.

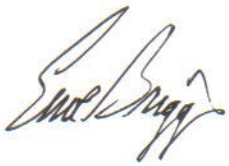
Wetlands near the propose project are limited to a small area of riparian wet meadow near one of the two streams crossed by Cochran Road, This is a Class Three wetland, and should not be affected by the project. The closest Class Two

Wetland is on the right (north) bank of the Winooski River upstream of the bridge. As noted above, the buffer zone of the wetland may extend as far as Bridge Street, but reconstruction of existing facilities would not require a Conditional Use Determination.

Although areas designated as Prime Agricultural Soils or Soils of Statewide Importance are found in the area, principally on low areas near the river, none will be impacted by proposed work.

No rare, threatened or endangered species were observed, nor was any habitat likely to support such species. And because the area has a long history of residential and commercial development, no rare and irreplaceable natural communities were found.

Sincerely,

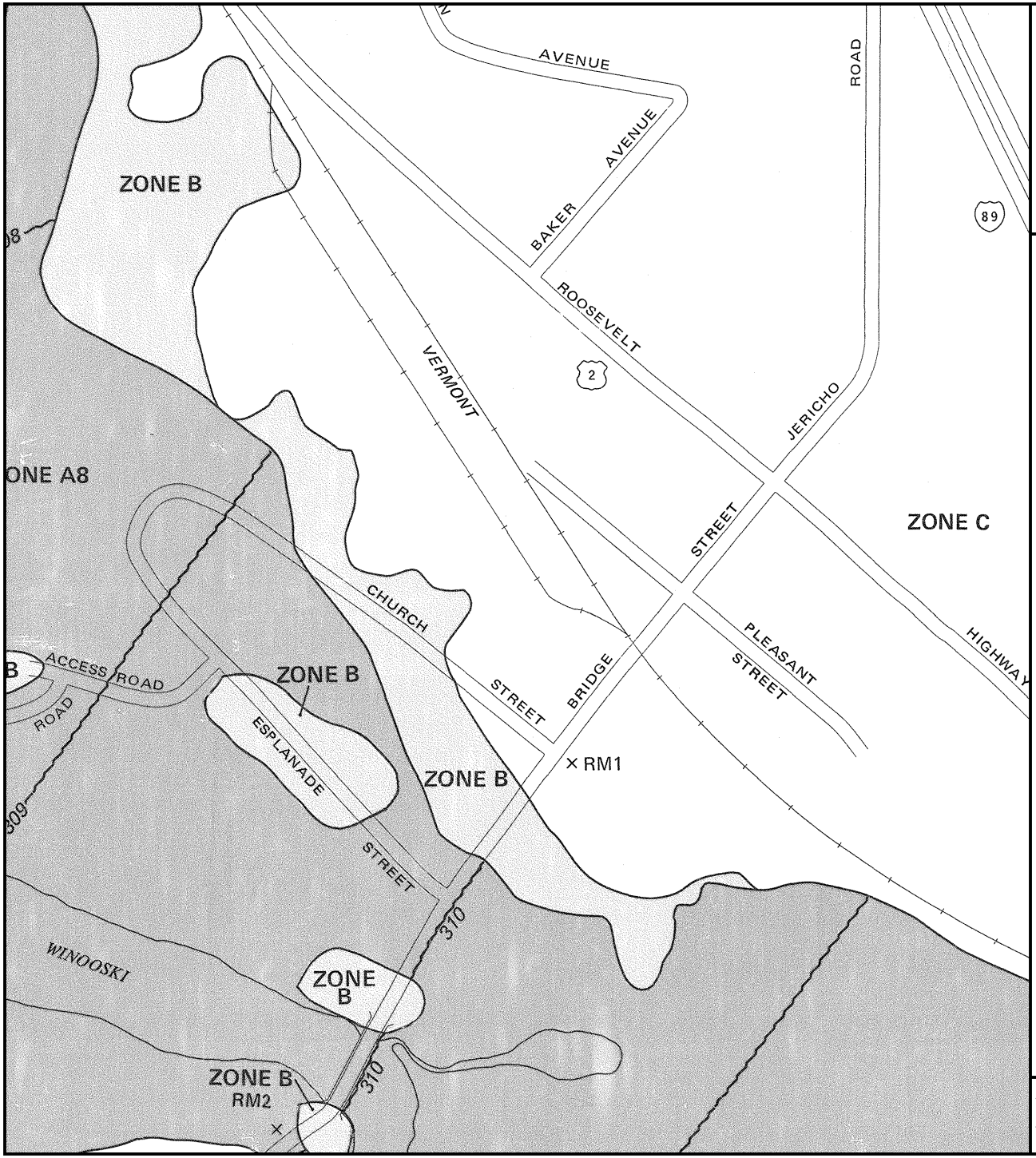


Errol C. Briggs

ECB/s
Encl.

EXHIBIT C

FLOOD PLAIN MAP



N

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

VILLAGE OF
RICHMOND,
VERMONT
CHITTENDEN COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
500041 0001 B

EFFECTIVE DATE:
AUGUST 2, 1982

Federal Emergency Management Agency

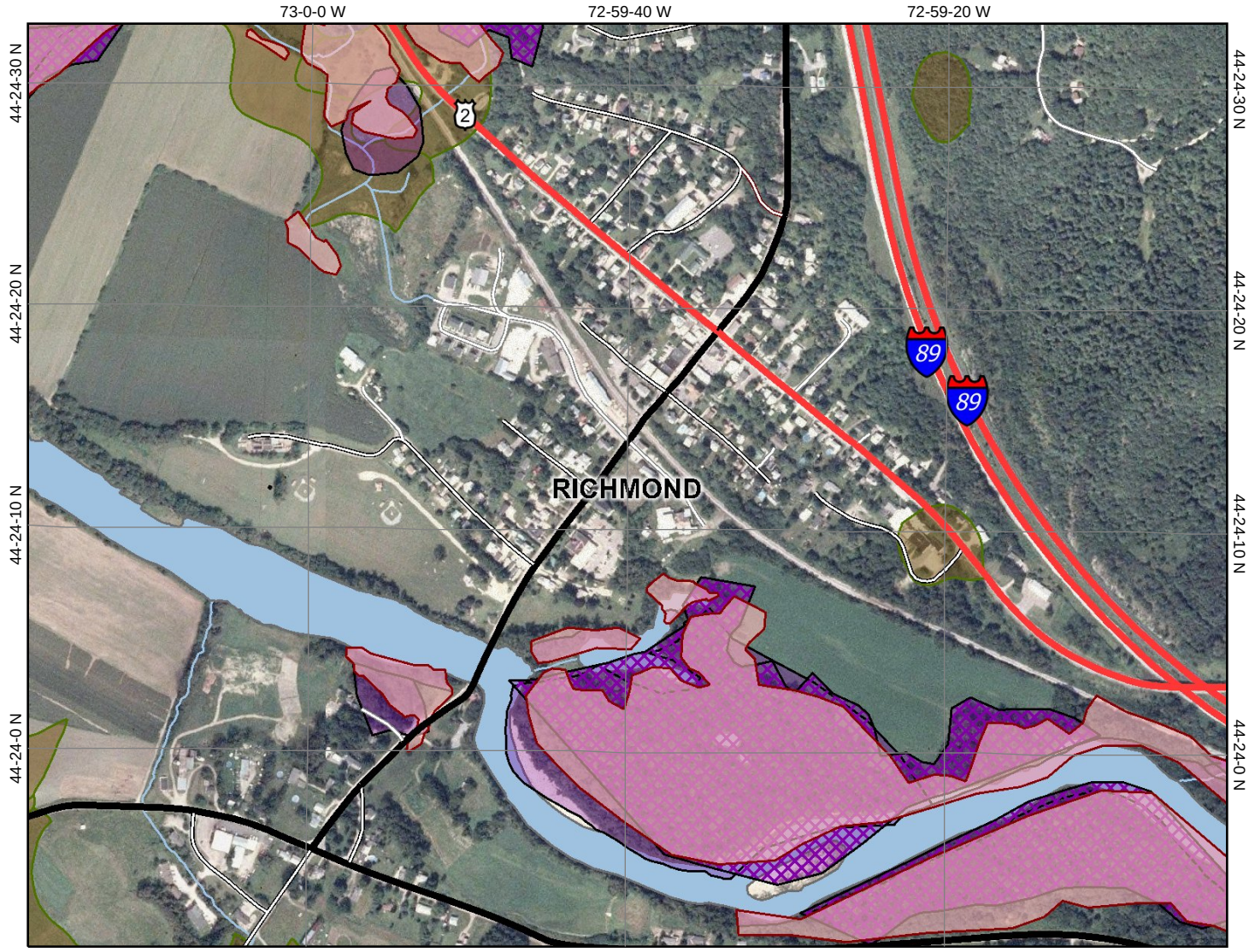
EXHIBIT D

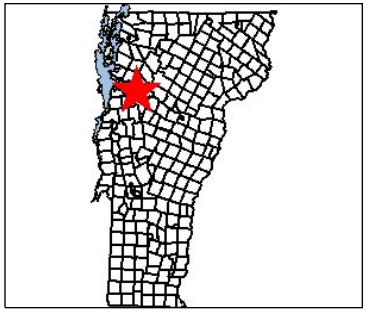
WETLANDS MAP

ANR Environmental Interest Locator

Vermont Agency of Natural Resources (ANR)

Richmond 4a and 7a Wetlands





Legend

Roads
- US Highway
- Vermont State Highway
- Class One
- Class Two
- Legal Trail
- Emergency U-Turn Area
- Proposed Class Two
- Proposed Class Three
- Proposed Vermont State Highway
- Proposed US Highway
- Proposed Interstate
- Discontinued Interstate
- Class Three
- Class Four
- State/National Forest Highway
- Military Road (No Public Access)
- Private Road
- Wetland Advisory Layer: Town Wetland Mapping

VSWI
- Class 1 Wetland
- Class 2 Wetland
- Class 3 Wetland

Proposed VSWI
- Class 1 Wetland
- Class 2 Wetland
- Class 3 Wetland
- Hydrography Lakes and Ponds (VHD 5k)
- Hydrography (VHD 5k)
- VT County Boundary

Hydric Soils
- Hydric Soils
- VT Town Boundaries (No Fill)

NAIP Color Orthophotos
- VT State Boundary (Fill)

VT State Plane Meters (NAD83)

0 900 1800 2700 ft.

Scale: 1:8,979

Map center: 460614, 211575

URL: http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp

10/20/09

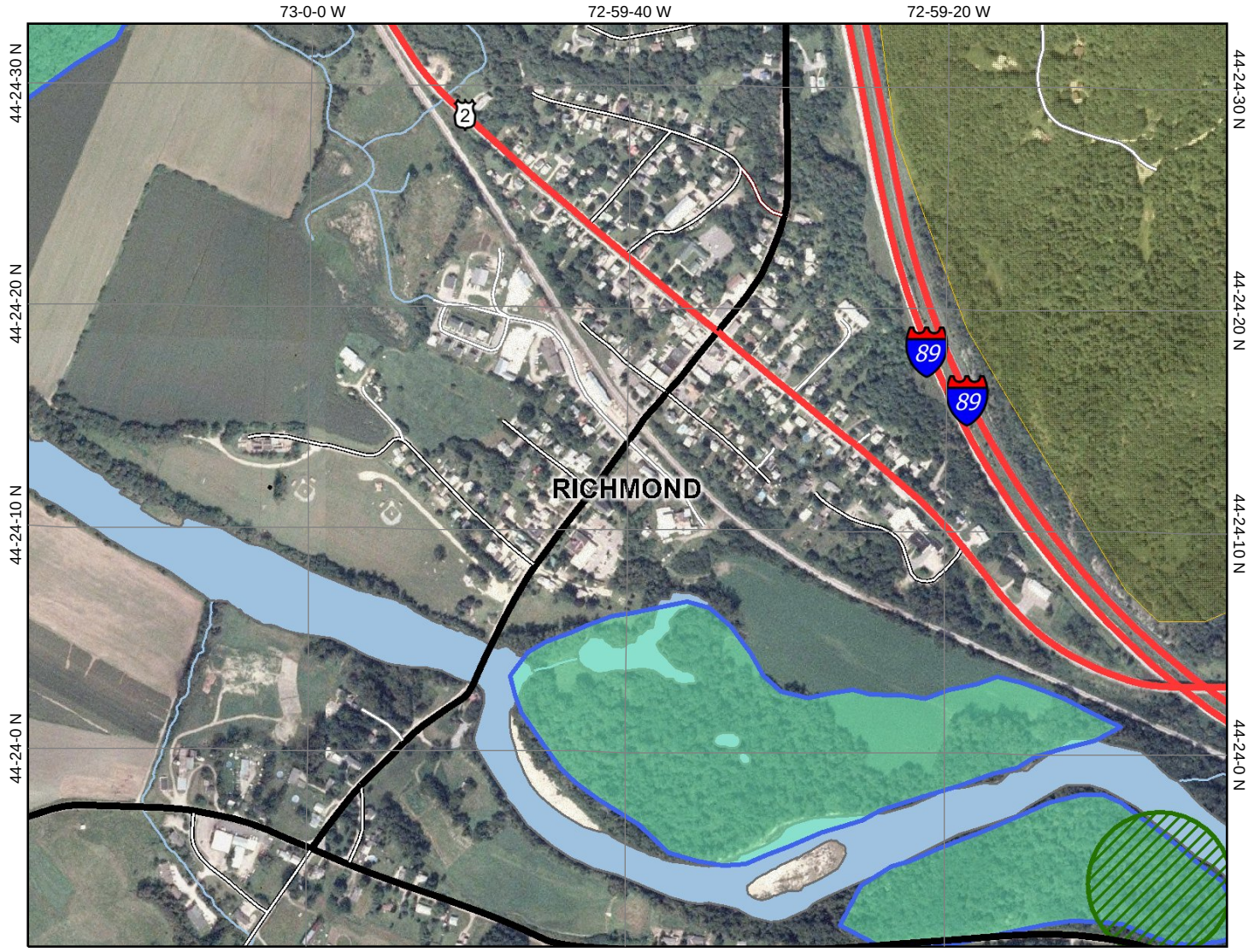
EXHIBIT E

VERMONT FISH AND WILDLIFE MAP AND THREATENED AND ENDANGERED SPECIES RESOURCE MAP

ANR Environmental Interest Locator

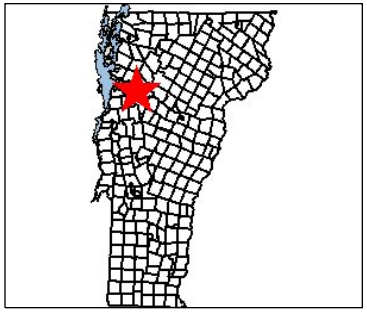
Vermont Agency of Natural Resources (ANR)

Richmond 4a and 7a Species Map



0 900 1800 2700 ft.

Map center: 460614, 211575



Legend

Roads
- US Highway
- Vermont State Highway
- Class One
- Class Two
- Legal Trail
- Emergency U-Turn Area
- Proposed Class Two
- Proposed Class Three
- Proposed Vermont State Highway
- Proposed US Highway
- Proposed Interstate
- Discontinued
- Interstate
- Class Three
- Class Four
- State/National Forest Highway
- Military Road (No Public Access)
- Private Road

Rare, Threatened, and Endangered Species
- Threatened or Endangered
- Rare (Not T or E)

Significant Natural Communities
- Palustrine
- Terrestrial

- Hydrography Lakes and Ponds (VHD 5k)
- Hydrography (VHD 5k)
- Deer Wintering Areas
- Indiana Bat Hibernacula By Town
- Indiana Bat Summer Range By Town
- Observed
- Potential
- VT County Boundary
- VT Town Boundaries (No Fill)
- NAIP Color Orthophotos
- VT State Boundary (Fill)

VT State Plane Meters (NAD83)

N

Scale: 1:8,979

URL: http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp

10/20/09

EXHIBIT F

ARCHEOLOGICAL RESOURCE ASSESSMENT-
SITE VISIT LETTER REPORT

HARTGEN
ARCHEOLOGICAL ASSOCIATES, INC.
CULTURAL RESOURCE SPECIALISTS
PO BOX 81 • PUTNEY, VERMONT 05346

Tyler Gingras
Green Mountain Engineering, Inc.
1438 South Brownell Road
Williston, Vermont 05495

RE: Results of Site Visit
Primary Initial Areas of Interest
Richmond Village Infrastructure Upgrade
Town of Richmond, Chittenden County
HAA #V481-31

October 28, 2009

Dear Tyler,

This letter describes the results of an inspection of the site of proposed sanitary sewer and storm sewer work in the Village of Richmond, Chittenden County, Vermont (Fig. 1). The components of the project discussed in this letter are considered urgent because they are proposed to be funded by the American Recovery and Reinvestment Act of 2009 (ARRA). The information in this letter will be included in a review of other portions of the project to be reviewed at a later date. The components reviewed in this letter include (Fig. 2):

- Five manholes on an existing sanitary sewer line along Bridge Street between Pleasant Street and Esplanade and lining of the existing sanitary sewer line on Bridge Street (Fig. 3A).
- One manhole at the end of an existing sewer on Esplanade.
- A storm sewer line from the intersection of Tilden Avenue and Millet Street to Main Street (Fig. 3B).
- A storm sewer line along Tilden Avenue between Baker and Millet.
- One manhole at the end of an existing sewer on Tilden Avenue.
- One manhole at the end of an existing sewer on Railroad Street.
- One manhole along an existing sewer on Lemroy Court.
- Two manholes at the end of existing sewer lines on East Main Street.

These portions of the project are reviewed separately from other project components to expedite the application for ARRA funding. Four additional manholes between West Main Street and Depot Street are expected to be added to this project (Fig. 2). However, access to those areas has not been obtained to date, so they are not discussed in this letter.

Site Visit

A site visit to the project area on October 5, 2009 examined the area of potential effects (APE) for archeological sensitivity of the areas outlined above. Results of the site visit are discussed below.

Bridge Street

The area of potential effects (APE) for the Bridge Street work will be approximately 6 meter (20 ft) diameter locations for each manhole centered on the existing sanitary sewer line (Fig. 3A). The existing line is approximately located under the sidewalk on the west side of Bridge Street. The installation of the sanitary sewer lining will not entail any excavation, since the lining will be installed within the existing pipe.

On Bridge Street, the APE is centered on the existing sanitary sewer alignment thought to be located under the existing sidewalk (Fig. 3A). The five areas proposed for excavation are located at intersections of Bridge Street and several side streets. The proposed 6 meter (20 ft) diameter excavations at intersections are proposed to not extend outside of the existing pavement. These locations have been heavily disturbed by road construction, flood scouring and other activities over the years.

The flood of 1927 scoured many areas of the flood plain in the vicinity of Esplanade. The road bed itself was heavily scoured at the intersection with Bridge Street (Fig. 5; Riggs et al. 2007:380). Therefore, with the new manhole to be placed within the pavement of the intersection, there is no archeological concern for this location.

One archeological feature that may remain under the Bridge Street pavement north of Church Street is the potential remains of a grain scale that was located in front of the Blue Seal Feeds building. The 1926 Sanborn Insurance Map of the area shows the scales directly across from Railroad Avenue. However, the scales appear to have been outside of the proposed APE of the sanitary sewer project.

Esplanade

One manhole is proposed for the end of the existing sanitary sewer line on Esplanade (Fig. 2). The excavation will be within the existing pavement (Fig. 6). This location is within alluvial soils and the deep scouring documented from the 1927 flood at the intersection with Bridge Street probably did not extend up the street into this area. Therefore, there is a potential for intact deeply buried archeological deposits to be present in the APE of the manhole. Before the manhole is installed, archeological investigation should be conducted under the pavement and outside of the disturbance for the existing sanitary sewer line.

Tilden Avenue/Millet Street

A proposed storm sewer upgrade from the intersection of Tilden Avenue and Millet Street to Main Street is planned to be within the bed of Millet Street. This new line will replace the existing storm sewer on the west side of the former Richmond Underwear Company building with a new line on the east side of the building in Millet Street, an approximately 213 meter (700 ft) alignment. A portion of the old line will be maintained to allow for flow from suspected inputs such as roof and cellar drains.

In the Tilden Avenue/Millet Street area, there is significant disturbance along most of the APE (Fig. 3B). Beginning at the north end of Millet Street, the existing storm sewer connects with an open drainage (Fig. 7). There is a headwall that will be replaced in-kind and a sanitary sewer manhole is located nearby. North of the headwall the open drainage may have been modified, but will not be disturbed by the headwall replacement.

Along Millet Street, east of the Richmond Underwear Factory building, there has been substantial disturbance. The construction of Millet Street and installation of sanitary sewer and some storm sewer alignments has disturbed much of the paved area. However, until at least 1976 original portions of the building extended east from the northeast corner of the building, potentially into the APE (Fig. 8). These building sections included a 50 foot tall chimney and a coal fired boiler that provided steam heat for the complex. Beneath the asphalt and gravel parking lot, there are probably foundation remains of these features. Further southwest along Millet Street the pavement narrows significantly as it approaches Main Street. The existing sanitary sewer and, apparently, a water line are located in the street.

The existing storm sewer alignment can not be completely abandoned due to suspected input from small sources such as domestic roof and cellar drains. A proposed solution is to connect the existing line to a new line in Millet Street by adding a short east to west connection between an existing catch basin and the new line south of the underwear factory building (Fig. 9). The proposed alignment has been substantially disturbed by the existing catch basin, an adjacent driveway, Millet Street and a short lived entrance addition on the southern end of the building (Fig. 8). There are no archeological concerns for this location. There is some possibility that the connection would be placed further to the north in an area that is appears undisturbed. If that option is pursued, some shovel testing is recommended.

On Tilden Avenue, the existing sanitary sewer extends along the south side of the road to Baker Street. It is proposed to add a storm sewer line along Tilden to divert storm water from the existing line west of the underwear factory building to a new line along Tilden to the proposed line along Millet (Fig. 2). Although the APE extends outside of the existing pavement, the close proximity of the houses to the street suggests disturbance along the 1.5 meter (5 ft) portion of the APE outside of the pavement from parking, house service placement, house construction, etc. There are no archeological concerns for this installation.

A manhole on Tilden Avenue is proposed to be placed at the end of the existing sanitary sewer line along the north side of the road adjacent to 114 Tilden Avenue (Fig. 2). In this location, Tilden Avenue has been cut into the landscape and there is no concern for archeological deposits within 1.5 meters (5 ft) of the pavement. There are no archeological concerns for this installation.

Railroad Street

A new manhole is proposed for the end of an existing sanitary sewer line along Railroad Street (Fig. 2). This vicinity has been heavily disturbed by road and railroad activities for many years. There are no archeological concerns for this installation.

Lemroy Court

A new manhole is proposed to be inserted into an existing sanitary sewer line on Lemroy Court (Fig. 2). The proposed disturbance will be within the existing roadway that has been substantially disturbed. There are no archeological concerns for this installation.

East Main Street

Two manholes are proposed for East Main Street in the vicinity of 189 East Main Street (Fig. 2). This area has been disturbed by road construction and there are no archeological concerns for these installations.

Conclusions and Recommendations

The examination of histories, maps, photos, soils information and the site visit indicate that much of the project APE has been disturbed by road construction, utility placement, grading and flooding. However, there are two areas of concern for archeological sensitivity (Table 1).

The proposed manhole on Esplanade may disturb intact deeply buried archeological deposits. An archeological excavation is recommended to examine the area for intact archeological deposits under the pavement within the manhole APE and outside of the disturbance of the existing line. This excavation would consist of removal of the asphalt offset from the proposed manhole location, backhoe excavation of the underlying soil to remove fill soil associated with the road and sewer line to the point where natural soil is identified in the base of the excavation. Once the natural soil is located, a 1x2 meter (3x6 ft) unit will be excavated into the intact alluvial soils to examine the soils for evidence of intact archeological deposits.

In the Millet Street area, no disturbance is expected north of the headwall in the open drain area. If disturbance is necessary in that area, archeological testing is recommended. If the storm sewer is placed along Millet Street and can not avoid possible foundation remains associated with the underwear factory boiler and chimney, archeological testing is recommended. If this area can not be avoided, archeological investigation would consist of backhoe removal of the asphalt and

gravel of the parking lot in the area of the proposed alignment, to determine the presence of the remains of the boiler. If such remains are identified, they would be cleared off with shovels and recorded with drawings and photography. At the south end of the building, there is a possibility that the connection between the new and old storm sewer lines could be placed north of the existing catch basin in an area that is relatively undisturbed. If that occurs, shovel testing is recommended in that vicinity.

Table 1. Areas of Archeological Concern.

Location	***Description***	***Potential***	***Recommendations***
Esplanade	Manhole	Precontact	Backhoe and hand excavation adjacent to proposed manhole location
Millet NE of factory	Storm sewer	Historic	Backhoe stripping of parking lot surface to examine alignment for boiler remains if alignment cannot avoid area
Millet SW of factory	Storm sewer	Historic	Shovel testing in undisturbed area if connection is moved to north

This letter relates to portions of the APE that are considered urgent. The archeological and historic preservation review of the remaining APE will be reported in a forthcoming report. Concurrence with the recommendations in this letter concerning the Esplanade manhole and the potential for the boiler foundation should be obtained from Scott Dillon of the Vermont Division for Historic Preservation.

Sincerely,

Thomas R. Jamison, Ph.D.
Project Manager

Cc: Scott Dillon, VDHP

Attachments:
Bibliography
Figures

Bibliography

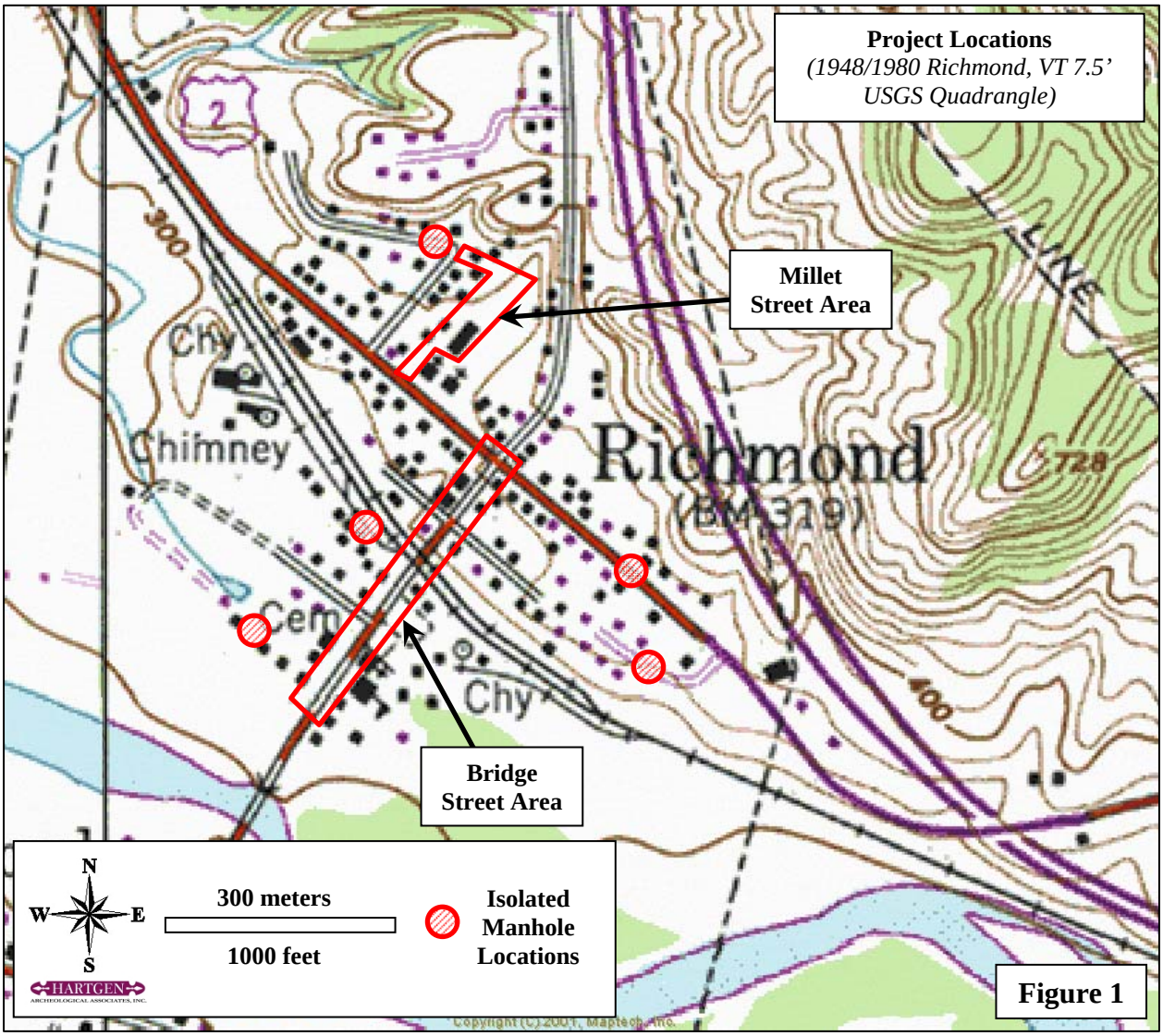
Riggs, Harriet Wheatley, and others
2007 *Richmond, Vermont: A History of More Than 200 Years.* Richmond Historical Society.

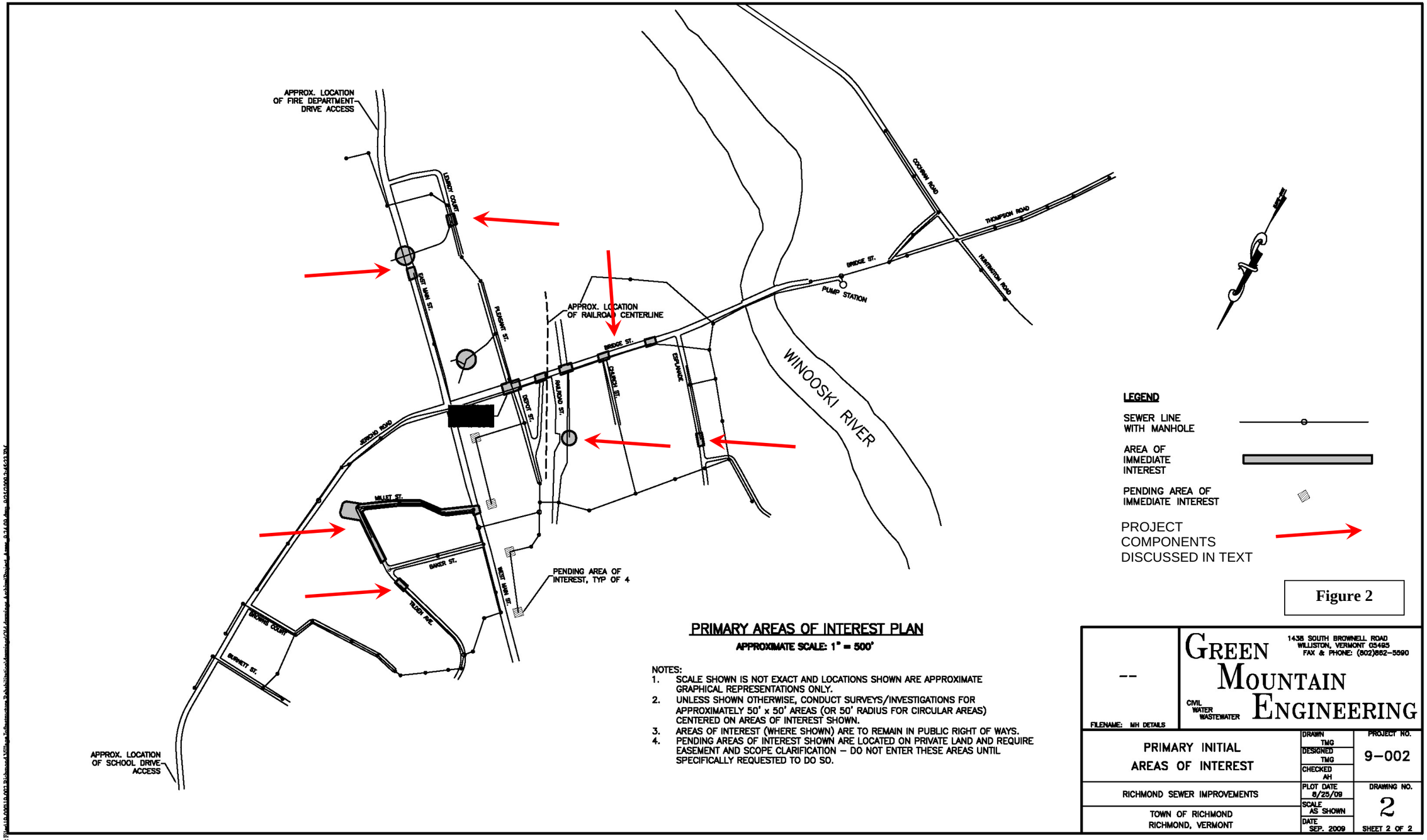
Sanborn Map Company
1926 Richmond, Vermont, sheet 4. Sanborn Map Company, Pelham, NY.

United States Department of Agriculture (USDA)
2009 Web Soil Survey of Chittenden County. Available online at http://websoilsurvey.nrcs.usda.gov/ accessed 10/2/2009.

United Stated Geological Survey (USGS)
1948/1980 *Richmond, Vermont 7.5' USGS Quadrangle.* Reston, VA.

Vermont Historic Sites and Structures Survey (VHSSS)
1976 North Main Street Historic District. Form on file at the Vermont Division for Historic Preservation, Montpelier.


Project Locations
(1948/1980 Richmond, VT 7.5' USGS Quadrangle)
Millet Street Area
Bridge Street Area
Richmond
(BM 319)
Chimney
Cem
Chy
300
400
N
W
E
S
300 meters
1000 feet
Isolated Manhole Locations
HARTGEN
Figure 1



PRIMARY AREAS OF INTEREST PLAN

APPROXIMATE SCALE: 1" = 500'

NOTES:
1. SCALE SHOWN IS NOT EXACT AND LOCATIONS SHOWN ARE APPROXIMATE GRAPHICAL REPRESENTATIONS ONLY.
2. UNLESS SHOWN OTHERWISE, CONDUCT SURVEYS/INVESTIGATIONS FOR APPROXIMATELY 50' x 50' AREAS (OR 50' RADIUS FOR CIRCULAR AREAS) CENTERED ON AREAS OF INTEREST SHOWN.
3. AREAS OF INTEREST (WHERE SHOWN) ARE TO REMAIN IN PUBLIC RIGHT OF WAYS.
4. PENDING AREAS OF INTEREST SHOWN ARE LOCATED ON PRIVATE LAND AND REQUIRE EASEMENT AND SCOPE CLARIFICATION – DO NOT ENTER THESE AREAS UNTIL SPECIFICALLY REQUESTED TO DO SO.

Figure 2

GREEN MOUNTAIN ENGINEERING
CIVIL WATER WASTEWATER
1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
FAX & PHONE: (802)862-5590

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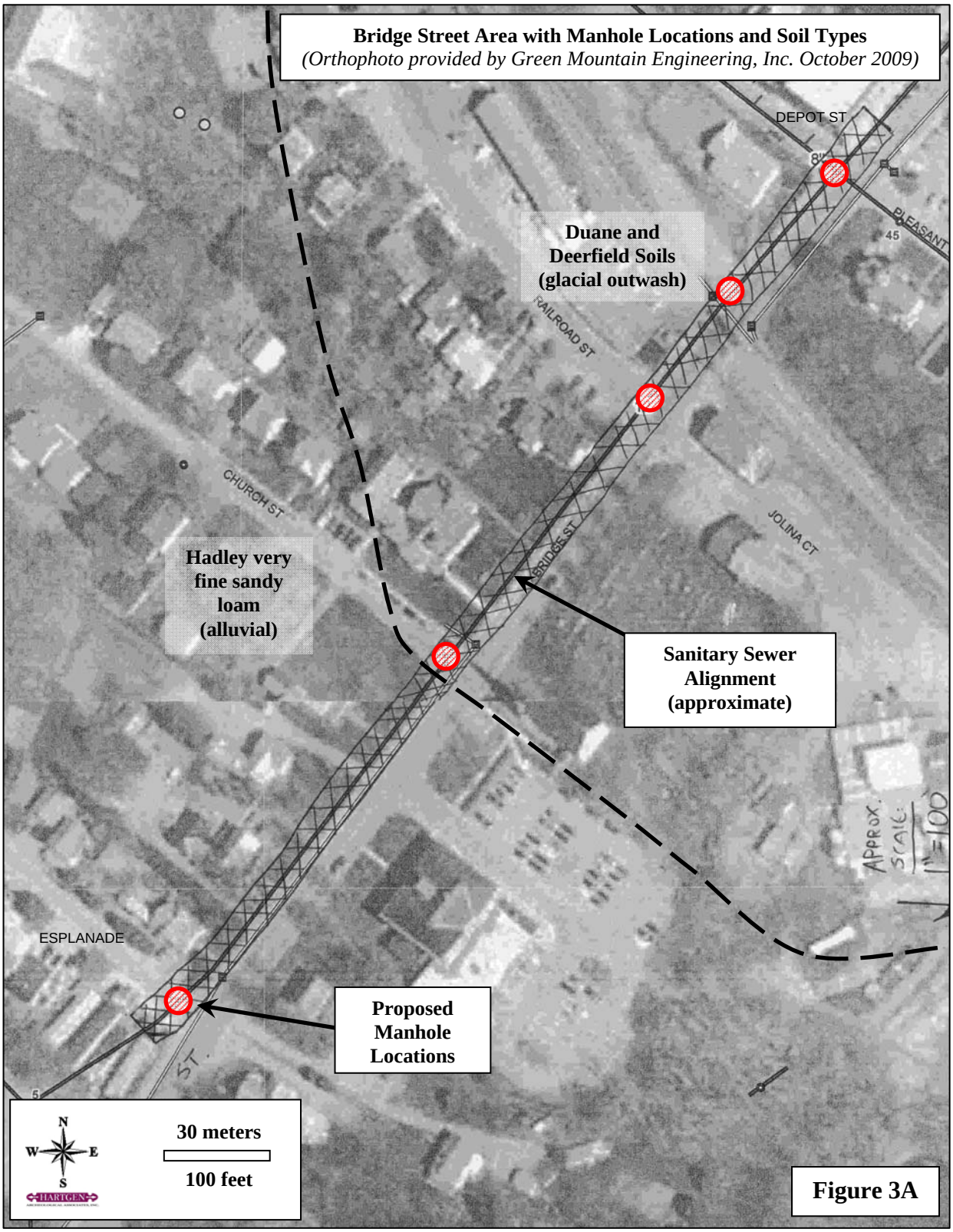
FILENAME: MH DETAILS		
PRIMARY INITIAL AREAS OF INTEREST	DRAWN TMG; DESIGNED TMG; CHECKED AH	PROJECT NO. 9-002
RICHMOND SEWER IMPROVEMENTS	PLOT DATE 8/25/09; SCALE AS SHOWN	DRAWING NO. 2
TOWN OF RICHMOND RICHMOND, VERMONT	DATE SEP. 2009	SHEET 2 OF 2


Bridge Street Area with Manhole Locations and Soil Types
(Orthophoto provided by Green Mountain Engineering, Inc. October 2009)
DEPOT ST
PLEASANT
45
Duane and Deerfield Soils (glacial outwash)
RAILROAD ST
CHURCH ST
BRIDGE ST
JOLINA CT
Hadley very fine sandy loam (alluvial)
Sanitary Sewer Alignment (approximate)
ESPLANADE
Proposed Manhole Locations
APPROX. SCALE: 1"=100'
N
W
E
S
HARTGEN
30 meters
100 feet
Figure 3A

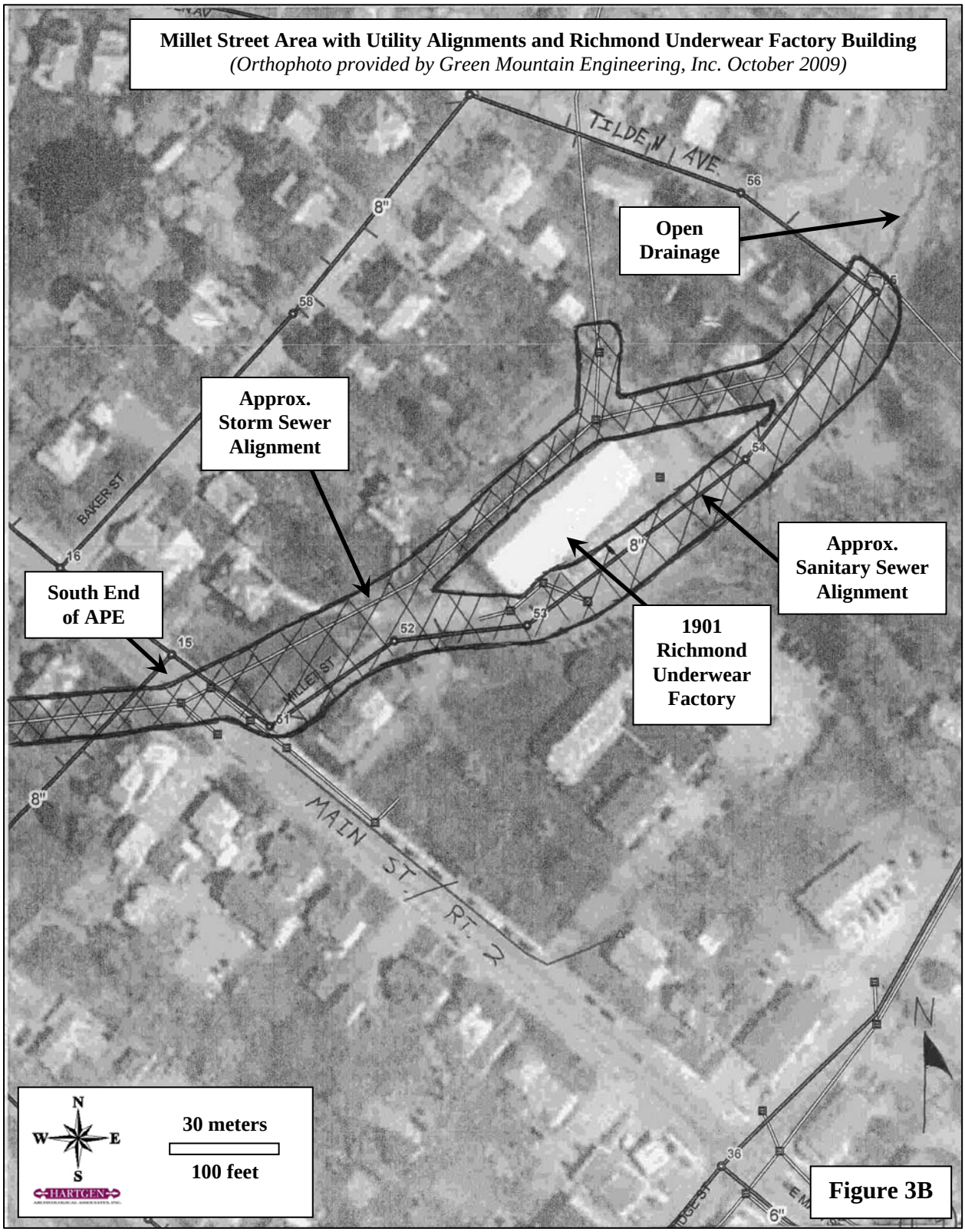

Millet Street Area with Utility Alignments and Richmond Underwear Factory Building
(Orthophoto provided by Green Mountain Engineering, Inc. October 2009)
TILDEN AVE.
Open Drainage
Approx. Storm Sewer Alignment
Approx. Sanitary Sewer Alignment
South End of APE
1901 Richmond Underwear Factory
BAKER ST
MILLET ST
MAIN ST. / RT. 2
8"
6"
56
58
54
53
52
51
16
15
36
N
W
E
S
30 meters
100 feet
HARTGEN
Figure 3B

Figure 4. Intersection of Bridge Street and Esplanade, the vicinity of proposed fifth manhole. Note fence in front of houses and existing sidewalk. View to the north.

Figure 5. Intersection of Bridge Street and Esplanade after the 1927 flood. Note approximately six feet of scour of the road surface and toppled barn in the background. House to the right is pictured in Figure 4. View to the northwest.

Figure 6. Esplanade in the vicinity of the proposed manhole. View to the east.

Figure 7. Area of open drainage at north end of Millet Street. Drainage is in overgrown area, sanitary sewer manhole to the left. Note level area to the right. View to the north.

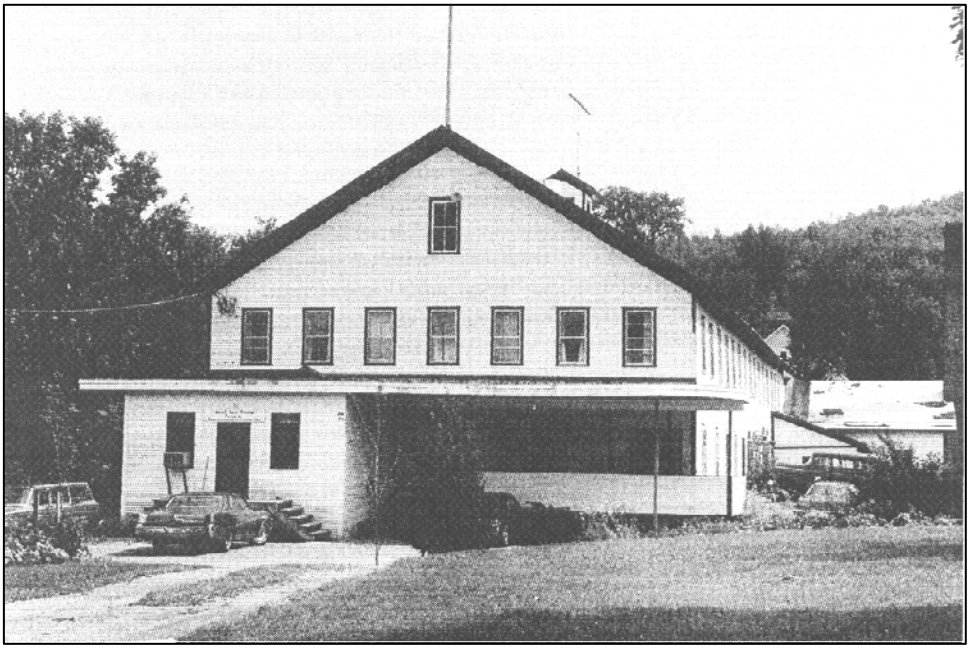
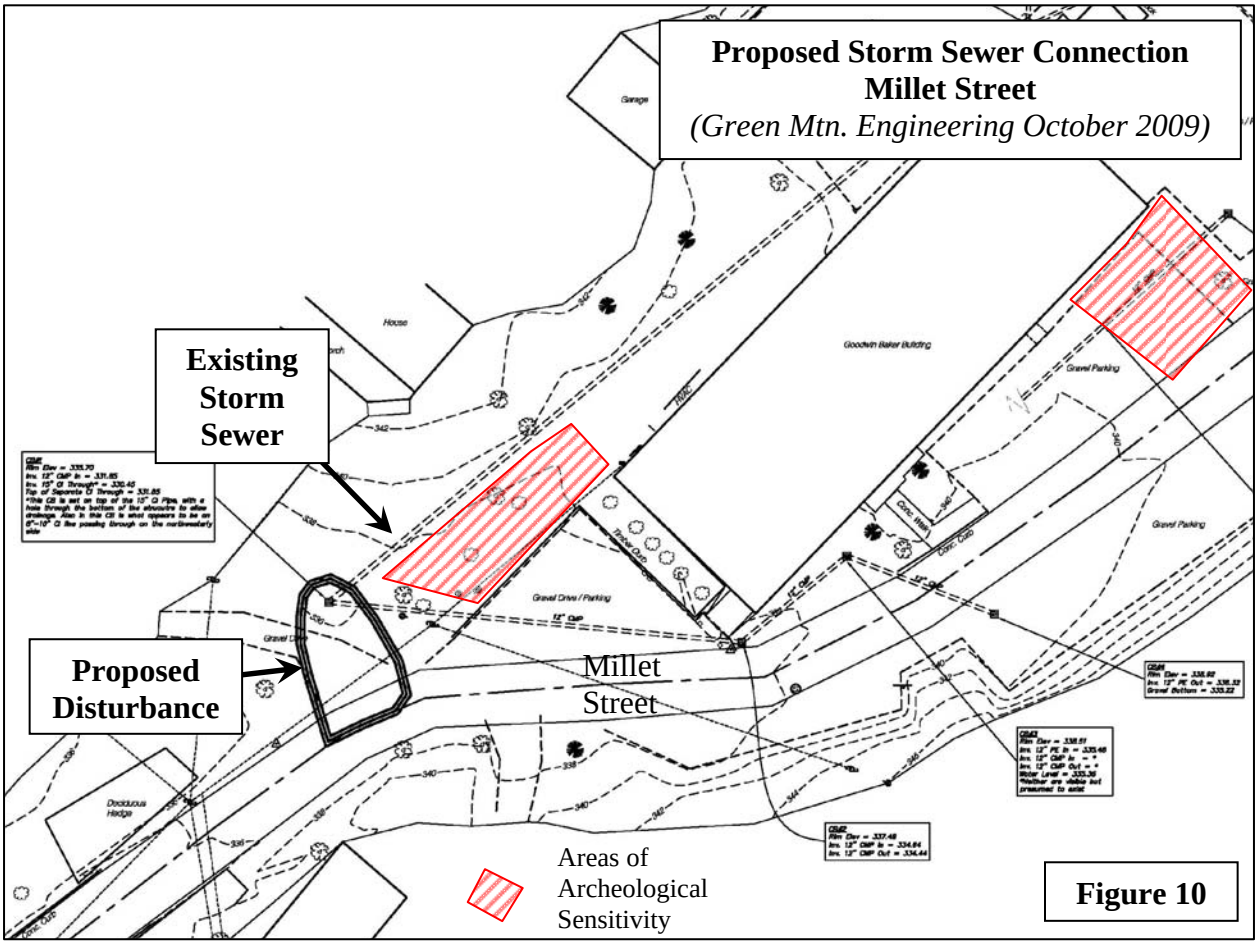


Figure 8. Richmond Underwear Factory building in 1976 (from VHSSS form). Note boiler room and chimney to the right and addition to the front of the building in the foreground. View to the north.

Figure 9. Vicinity of proposed connection between new and old storm sewer adjacent to Millet Street. White line marks approximate area of disturbance around existing catch basin (arrow). View to the north.


Proposed Storm Sewer Connection
Millet Street
(Green Mtn. Engineering October 2009)
Existing Storm Sewer
Proposed Disturbance
Millet Street
Areas of Archeological Sensitivity
Figure 10