Town of St. Johnsbury

Stormwater Infrastructure Mapping Project

February 2020

VTDEC – CLEAN WATER INITIATIVE PROGRAM, WATER INVESTMENT DIVISION

https://dec.vermont.gov/water-investment/cwi/solutions/developed-lands/idde

Jim Pease, Jim.Pease@vermont.gov
David Ainley, David.Ainley@vermont.gov

Overview

This stormwater infrastructure mapping project was completed for the municipality by the Agency of Natural Resources Clean Water Initiative Program to supplement the existing drainage data collected by the town and with the intention of providing a tool for planning, maintenance, and inspection of the stormwater infrastructure.

The GIS maps and geodatabase are meant to provide an overall picture and understanding of the connectivity or connectedness of the storm system on both public and private properties. They can be used to: (1) raise the awareness of the need for regular maintenance, the generation and transport of nonpoint source pollution increases with increasing connectivity of a drainage system, (2) as a valuable tool for hazardous material spill planning and prevention, (3) for the detection and elimination of illicit discharges; outfall locations and system connectedness data are used as a base for locating illicit or illegal discharges of non-stormwater to the municipal storm system and tracing them up to the source, (4) better assist the municipality in planning and implementing combined stormwater-sewer separation projects, (5) inform options for cleaning up existing polluted stormwater discharges; this report provides information and guidance for potential retrofit treatment locations and opportunities, (6) assist municipalities and residents with emergency preparedness for large rainfall events (i.e. Tropical Storm or Hurricanes) or spring snowmelt runoff events, by keeping storm drains clean, clear and open a good deal of localized flooding could be prevented, and (7) the basis for a local stormwater ordinance or be used to help enhance an existing stormwater management program.

Project Summary

The principal goal of this project was to develop up to date municipal drainage maps. These drainage maps were created showing the paths that stormwater runoff travels from where it falls on impervious surfaces such as parking lots, roads, and rooftops, to the outfall points in various receiving waters. These maps show the stormwater infrastructure including features like pipes, manholes, catchbasins, and swales within a municipality. Data sources included data collected from field work, a mapping grade Trimble GPS unit, available state permit plans, record drawings, town plans, WWMD plans, existing GIS data from contractors, and the input and guidance of knowledgeable members from the municipalities.

A second goal of this project was to establish potential locations for Best Management Practice (BMP) stormwater retrofit sites. These are sites where stormwater treatment structures could be added and where they would be most cost effective and efficient for sediment and phosphorus or nitrogen removal. In order to develop a retrofit site list, drainage area subwatersheds were delineated around the drainage networks. Determining how the stormwater infrastructure was connected was necessary in determining the subwatershed drainage areas within the town.

Delineating the drainage areas was done using the stormwater infrastructure maps, along with satellite imagery, a Digital Elevation Model (DEM), and USGS topographic maps. These data sources were used to approximate where the land area within each municipality was draining to; as well as where the high points were that divided the sub-drainage areas. The completed maps show the drainage coverage for essentially the entire municipality, but with a focus on areas with greater concentrations of impervious cover.

Impervious cover layers were created by either hand digitization or by using a method of raster pixel calculation (with ArcGIS spatial analyst extension) to create a vegetation index using the best available 4 band imagery (2016 NAIP). The area which contrasted with the vegetation represents impervious surfaces and was then modified with buffered water and roads layers to make it more accurate. A more detailed explanation of this process is available in a separate document. The impervious layer was used to calculate the

percent of each delineated drainage area that would generate stormwater runoff. The percentage of impervious surface number for each subwatershed was then adjusted with a connectivity rating. A rating was assigned to each drainage area polygon describing how directly connected the impervious surfaces within that subwatershed are to the receiving water. By adjusting the percent impervious area numbers with this connectivity rating the effective impervious area (EIA) was established for each subwatershed (*Sutherland, 1995*). This effective impervious number is a more accurate description of the amount of runoff produced by each of the subwatersheds because it helps to take factors such as infiltration into account.

After the effective impervious numbers were calculated for the subwatersheds the Simple Method was used to estimate the annual sediment (TSS) and phosphorus (TP) or Nitrogen (TN) loads generated by each subwatershed. The Simple method uses information which includes the adjusted impervious value, average annual rainfall for the location, total subwatershed area, and a given pollutant concentration value to calculate an annual load for various pollutants (*Schueler,1987*). Pollutant loads estimated by the Simple Method in this project are planning level estimates and are meant to give a general idea of the amounts of sediment or nutrient wash-off produced by each subwatershed for prioritization purposes. Subwatersheds were then prioritized, using the loading calculations as well as other criteria, and given Action List numbers ranging from 1 to 3 (one being the highest priority). Action List Priority 4 is reserved for properties with more than 3 acres of impervious cover and impacted by VTDEC General Permit 3-9050 and its requirement to retrofit the impervious cover on the parcel to new water quality design standards. The Action List number depends both upon loading values and feasibility of potential retrofit treatment options. Potential retrofit options listed in the TARGET maps are based on field observations and not on actual availability of land or willingness of landowner.

Water Quality Volume (WQv – the amount of storage needed to treat stormwater from a 0.9-1.0-inch storm) and Channel Protection Volume (CPv – the volume of storage that is needed to hold and slowly release stormwater for a 2.1inch rain event) were also calculated for delineated subwatershed areas. CPv calculations are only applicable if the receiving water is not a large body of water and is therefore susceptible to channel erosion. These numbers were used in the retrofit recommendation process because the volume of water to be treated was a key factor in determining the type of retrofit.

Project References

Schueler, T. 1987. Technical Documentation of a Simple Method for Estimating Urban Storm Pollutant Export. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Appendix A.

Schueler, T. et.al., 2007. Urban Stormwater Retrofit Practices, Version 1.0. Manual 3, Center for Watershed Protection, August 2007.

Sutherland, R. 1995. Methodology for Estimating the Effective Impervious Area of Urban Watersheds. Technical Note 58 – Pervious Area Management. Watershed Protection Techniques. Vol. 2, No. 1

***All data was created in an ArcGIS 10 Geodatabase format and is available from VTDEC.**

Act 64 Municipal Roads General Permit (MRGP)

The 2015 Vermont Legislature adopted Act 64 which will require all municipalities to address stormwater runoff from all hydrologically connected existing municipal roads. In January 2018 the final general permit was issued; municipalities must file a notice of intent to comply with the permit by July 31, 2018. As part of this permit all municipalities will be required, as explained below, to evaluate connected road segments with catch basin served infrastructure to determine compliance with MRGP Standards by December 31, 2020 as part of their road erosion inventory. The permit will require:

- Municipalities to develop road stormwater management plans. These plans will include a comprehensive (1) Road Erosion Inventory (REI) of hydrologically-connected road segments and (2) an Implementation Table.
- The inventory will include an evaluation of municipal hydrologically-connected road segments to determine if they meet the MRGP standards.
- Those road segments that do not currently meet MRGP standards and that can impact waterways will be prioritized for remediation within the Implementation Table. DEC has developed an Implementation Table-Portal for this purpose.

Municipalities will submit annual reports to DEC due on April 1st starting in 2019. The Annual Reports will document progress in upgrading roads to meet MRGP standards. Municipalities will be able to use the spread sheet, mentioned above, for annual compliance reporting requirements. This report and the mapping information contained in it can be used by municipalities to develop the plan for the paved road segments with catchbasins that are hydrologically directly connected. The map(s) and data provided with this report indicate where these road segments outfalls are located using the best available mapping information DEC has to date. The MRGP standard for paved roads with catch basins is that any outfalls that are eroded will have to be stabilized with practices such as stone aprons, culvert headwalls, and stone-lined ditches. As with other classes of roads covered by this permit the municipality should first check the maps provided. DEC suggests municipalities take the following steps to check the maps and/or data provided to determine what outfalls will require municipal attention for erosion repair:

1. Using the provided maps and/or data as a guide confirm that the road draining to this outfall is paved, and the discharge pipe from the catchbasin(s) is directly discharging to waters of the state. Include any outfall from these road segments that discharges within 500 linear feet of surface waters.

2. Using the maps locate the outfall and note any level of erosion present in the outfall and/or in the 500 foot or less long swale between the pipe outlet and waters of the state.

3. Prepare a list of all outfalls with notes pertaining to the erosion using the Guidance and Field Sheet or the i-phone application.

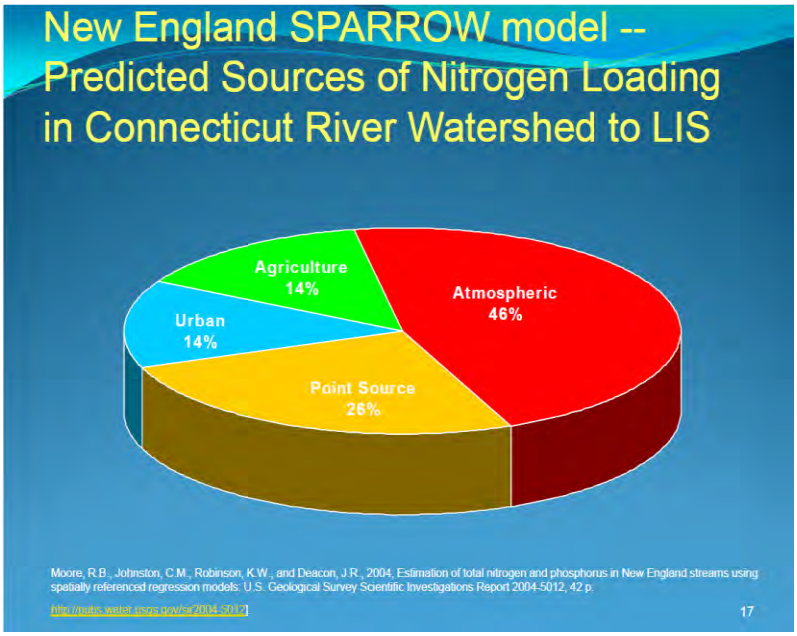
   Inventory Guidance:
   http://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/MunicipalRoads/sw_MRGP_PavedRoadsWithCathBasins_REI-Supplement.pdf
   Field Sheet (use form C only):
   http://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/MunicipalRoads/sw_MRGP_RoadErosionInventory.pdf

   I-phone Application:

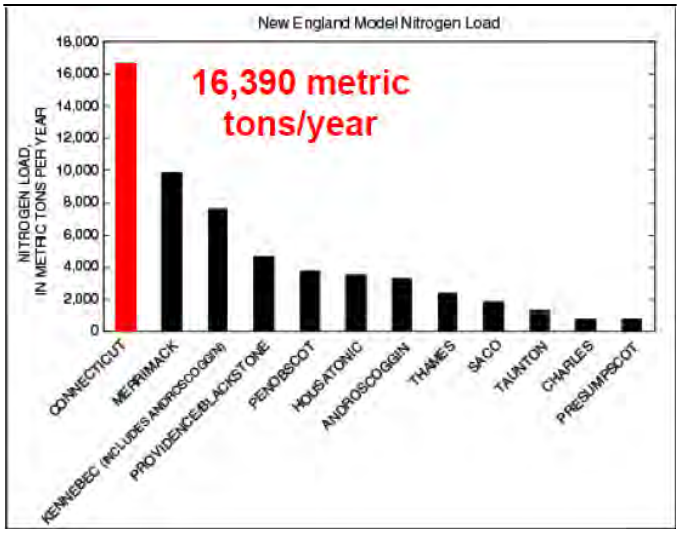
   http://vtanr.maps.arcgis.com/home/item.html?id=fe11c5ffd0d04eeca968115d84dacf90
   Please contact Jim Ryan at Jim.Ryan@vermont.gov for user ID and password

Long Island Sound – Connecticut River Watershed Nitrogen Overview

- This map shows an overview of the extent of the Connecticut River watershed including areas of Vermont, New Hampshire, Massachusetts, and Connecticut.



- This figure shows the modeled nitrogen loading contribution per year from the Connecticut River basin to the Long Island Sound.



- This graph shows the breakdown of the modeled nitrogen load from the Connecticut River watershed to the Long Island Sound from various sources.

- Above figure taken from USGS – *Assessment of Total Nitrogen in the Upper Connecticut River Basin in New Hampshire, Vermont, and Massachusetts, Dec 2002 – Sept 2005*. http://pubs.usgs.gov/sir/2006/5144/pdf/sir2006-5144.pdf

- Above figures taken from EPA/USGS – *Application of NHDPlus for SPARROW nutrient modeling of the Northeastern and Mid-Atlantic Region of the US* http://www.awra.org/orlando2010/presentations/Session22/NHDPlus_SPARROW_AWRA20100330-good.pdf

Subwatershed Data

Tables showing calculations and Priority drainage area retrofit possibilities

This is a key showing the abbreviations of the different funding programs listed in the calculation sheets.

Abbreviation Key	
Code	**Funding Program**
BR	Better Roads-VTrans
ERP/CWIP	VTDEC Clean Water Initiative Program
LCBP	Lake Champlain Basin Program
LISFF	Long Island Sound Futures Fund
SRF	Clean Water State Revolving Loan Fund
VTrans	Vermont Agency of Transportation Alternatives or Municipal Highway and Stormwater Mitigation Programs

This is a key showing the abbreviations of the stormwater treatment structures or practices listed in the reports.

Abbreviation Key	
Code	**Structure Type**
BB	Baffle Box
BFCB	Baffled Catchbasin
BRA	Bioretention Area or Raingarden
BS	Buffer Strip (25' Min.)
CB	Catch Basin
CBI	Catch Basin Insert
CD	Check Dam
CR or ESRD	Impervious Disconnection Credits
DP/DS	Dry Pond or Dry Swale
DW	Drywell
EDP (EDPMP)	Extended Detention Pond (with Micropool)
GS	Grass Swale
IB/ IG	Infiltration Basin or Infiltration Gallery
MOD	Modifications/upgrade to 2017 SW Standards
OF	Overland Flow
OGF	Organic Filter
PA/PC/PV	Pervious Asphalt or Pervious Concrete or Pervious Pavers
POP	Pocket Pond
PP	Perforated Pipe or Underdrain
PS	Pump Station
RDD	Roof Drain Disconnect
RR/RS	Rock Riprap or Rock Swale
SB	Sedimentation Basin
SF	Sand Filter (aka Surface Sand Filter)
SS or VS	Swirl Separator
SWPPP	Stormwater Pollution Prevention Plan
TT	Treatment Tank
URB	Underground Tank
WL/WP/WS	Wetland (Constructed) or Wet Pond or Wet Swale (aka Bioswale)

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
1 St. Johnsbury			CB		3.31	25.45	987	987	8.2	8.2
2 St. Johnsbury			CB/GS	3350-9010	15.10	17.00	2263	2263	18.9	18.9
3 St. Johnsbury	4		CB/SB/EDP/GS	3242-9010	68.79	7.60	2013	2013	29.4	29.4
4 St. Johnsbury	4		GS		292.13	3.55	21693	21693	180.8	180.8
5 St. Johnsbury	4		CB/GS	3242-9010	4.91	40.12	1256	1256	11.8	11.8
6 St. Johnsbury	4		CB		1.77	95.13	2110	2110	17.6	17.6
7 St. Johnsbury	4		CB		0.22	81.05	224	224	1.9	1.9
8 St. Johnsbury	1	Infiltration basin in front of parking lot	IB/CB/OF		1.39	88.03	1465	146	12.2	1.2
9 St. Johnsbury			CB/GS	3187-9010	1.15	56.21	475	475	4.5	4.5
10 St. Johnsbury			CB/GS	3187-9010	0.67	74.54	426	426	4.0	4.0
11 St. Johnsbury			CB/GS		60.53	8.84	5910	5910	49.2	49.2
12 St. Johnsbury			CB		0.20	91.97	231	231	1.9	1.9
13 St. Johnsbury			OF		0.80	89.18	886	886	7.4	7.4
14 St. Johnsbury			OF		0.94	75.36	867	867	7.2	7.2
15 St. Johnsbury			CB/GS		10.13	26.04	2277	2277	19.0	19.0
16 St. Johnsbury			OF		2.64	31.62	735	735	6.1	6.1
17 St. Johnsbury			CB/GS	3286-9010	10.92	37.93	434	434	4.8	4.8
18 St. Johnsbury	1	Constructed wetland or pond near outfall on VTrans land	WL/CB/GS/IG(2)/SF	5895-9015/ 3092-9010	24.35	42.10	5730	3438	63.7	38.2
19 St. Johnsbury			GS/CB	3092-9010	1.61	64.59	819	819	7.7	7.7

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
1 St. Johnsbury	0.06	FALSE					CWIP, SRF, LISFF, OTHER	28	$12,844
2 St. Johnsbury	0.13	0.28					CWIP, SRF, LISFF, OTHER	64	$29,454
3 St. Johnsbury	0.28	0.58					CWIP, SRF, LISFF, OTHER	142	$65,500
4 St. Johnsbury	1.23	FALSE					CWIP, SRF, LISFF, OTHER	614	$282,292
5 St. Johnsbury	0.09	0.22					CWIP, SRF, LISFF, OTHER	44	$20,430
6 St. Johnsbury	0.12	0.18					CWIP, SRF, LISFF, OTHER	60	$27,454
7 St. Johnsbury	0.01	0.02					CWIP, SRF, LISFF, OTHER	6	$2,917
8 St. Johnsbury	0.08	0.13	$75,797		$58	$6,901	CWIP, SRF, LISFF, OTHER	41	$19,058
9 St. Johnsbury	0.03	FALSE					CWIP, SRF, LISFF, OTHER	17	$7,721
10 St. Johnsbury	0.03	FALSE					CWIP, SRF, LISFF, OTHER	15	$6,924
11 St. Johnsbury	0.33	FALSE					CWIP, SRF, LISFF, OTHER	167	$76,905
12 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	7	$3,001
13 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	25	$11,530
14 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	25	$11,287
15 St. Johnsbury	0.13	FALSE					CWIP, SRF, LISFF, OTHER	64	$29,625
16 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	21	$9,560
17 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	20	$9,415
18 St. Johnsbury	0.54	FALSE	$164,754		$72	$3,981	CWIP, SRF, LISFF, OTHER	270	$124,272
19 St. Johnsbury	0.06	FALSE					CWIP, SRF, LISFF, OTHER	29	$13,319

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
20 St. Johnsbury	4	Enhanced buffer along Passumpsic River	BS/GS/OF	4482-9015	35.76	37.19	12048	9638	100.4	80.3
21 St. Johnsbury	2,4	Combine with 3012 after separation.	VS/CB/GS/SWPPP	5403-9003	3.57	76.63	3090	927	25.7	23.2
23 St. Johnsbury	1	Extended Detention Micropool or Swirl Separator northeast of 249 Bay Street. Combine with DA 3016 when separate.	VS/EDPMP/CB		49.95	65.15	42132	8426	351.1	210.7
24 St. Johnsbury	4		OF		8.00	39.55	2904	2904	24.2	24.2
25 St. Johnsbury			CB		1.55	73.46	1461	1461	12.2	12.2
26 St. Johnsbury	1	Remove roof drain to sewer at 481 Summer St. Add DA #3013 when separated.	VS(2)/CB/OF		189.82	32.91	29013	29013	544.0	544.0
27 St. Johnsbury			CB/GS	7547-9015	4.11	43.62	295	295	7.4	7.4
28 St. Johnsbury			CB		1.11	95.13	1325	1325	11.0	11.0
29 St. Johnsbury			CB		42.41	25.41	12634	12634	105.3	105.3
30 St. Johnsbury	4		CB		1.71	99.04	2135	2135	17.8	17.8
31 St. Johnsbury			GS/CB/OF		50.96	4.00	3864	3864	32.2	32.2
32 St. Johnsbury			CB/OF		0.47	75.24	449	449	3.7	3.7
33 St. Johnsbury			CB/GS	3518-9010	1.06	61.85	506	506	4.7	4.7
34 St. Johnsbury	4		CB/GS		3.66	83.59	3784	3784	31.5	31.5
35 St. Johnsbury			DW		1.65	0.00	77	77	0.8	0.8
36 St. Johnsbury	2	Upgrade sediment basin to 2017 standards	MOD/SB/GS/CB		11.74	34.68	2182	1309	24.2	17.0
37 St. Johnsbury	2,4	Combine with 38,39. Upgrade basin to 2017 standards	MOD/SB/GS/CB		6.55	60.35	2459	1475	27.3	19.1
38 St. Johnsbury	2,4	Combine with 37,39. Upgrade basin to 2017 standards	MOD/SB/GS/CB		2.07	28.29	305	183	3.4	2.4

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
20 St. Johnsbury	0.68	FALSE		$10,000	$4	$498	CWIP, SRF, LISFF, OTHER	341	$156,773
21 St. Johnsbury	0.17	FALSE					CWIP, SRF, LISFF, OTHER	87	$40,207
23 St. Johnsbury	2.38	FALSE	$745,743		$22	$5,310	CWIP, SRF, LISFF, OTHER	1192	$548,258
24 St. Johnsbury	0.16	FALSE					CWIP, SRF, LISFF, OTHER	82	$37,794
25 St. Johnsbury	0.08	FALSE					CWIP, SRF, LISFF, OTHER	41	$19,014
26 St. Johnsbury	4.10	FALSE					CWIP, SRF, LISFF, OTHER	2052	$943,855
27 St. Johnsbury	0.08	FALSE					CWIP, SRF, LISFF, OTHER	42	$19,199
28 St. Johnsbury	0.07	FALSE					CWIP, SRF, LISFF, OTHER	37	$17,237
29 St. Johnsbury	0.71	FALSE					CWIP, SRF, LISFF, OTHER	357	$164,404
30 St. Johnsbury	0.12	FALSE					CWIP, SRF, LISFF, OTHER	60	$27,779
31 St. Johnsbury	0.22	FALSE					CWIP, SRF, LISFF, OTHER	109	$50,280
32 St. Johnsbury	0.03	FALSE					CWIP, SRF, LISFF, OTHER	13	$5,844
33 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	18	$8,223
34 St. Johnsbury	0.21	FALSE					CWIP, SRF, LISFF, OTHER	107	$49,246
35 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	3	$1,423
36 St. Johnsbury	0.21	FALSE	$35,500		$41	$2,662	CWIP, SRF, LISFF, OTHER	103	$47,333
37 St. Johnsbury	0.23	FALSE					CWIP, SRF, LISFF, OTHER	116	$53,328
38 St. Johnsbury	0.03	FALSE					CWIP, SRF, LISFF, OTHER	14	$6,614

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
39 St. Johnsbury	2,4	Combine with 37,38. Upgrade basin to 2017 standards	MOD/SB/GS/CB		3.01	17.19	273	164	3.0	2.1
40 St. Johnsbury			OF		23.23	21.90	4380	4380	36.5	36.5
41 St. Johnsbury			OF/CB		5.49	18.89	902	902	7.5	7.5
42 St. Johnsbury			OF		16.54	8.66	1599	1599	13.3	13.3
43 St. Johnsbury			CB/OF	3518-9010	5.99	34.31	1834	1834	15.3	15.3
44 St. Johnsbury			CB/GS	7114-9015.A	9.05	36.89	1811	1811	20.1	20.1
45 St. Johnsbury	2	Fix erosion below outfall	RR/CB		1.80	30.03	474	379	3.9	3.2
46 St. Johnsbury			GS/CB		12.92	14.98	1750	1750	14.6	14.6
47 St. Johnsbury			GS/CB		2.94	25.31	642	642	5.4	5.4
48 St. Johnsbury			GS/CB		17.02	6.60	1473	1473	12.3	12.3
49 St. Johnsbury			CB		10.58	28.19	2590	2590	21.6	21.6
50 St. Johnsbury	2	Extended Detention Pond on Town land at Bay St.-Weeks Ct. Combine with separated 3002.	EDPMP/CB		21.65	21.52	5541	1108	46.2	27.7
51 St. Johnsbury			CB		4.68	26.24	1061	1061	8.8	8.8
52 St. Johnsbury			OF/CB		0.29	86.68	295	295	2.5	2.5
53 St. Johnsbury			OF		11.69	29.78	3041	3041	25.3	25.3
54 St. Johnsbury			CB		7.56	40.54	2831	2831	23.6	23.6
55 St. Johnsbury	1	Infiltration basin at old factory behind 599 Portland St. Combine with separated DA 3004 and DA 3032	IB/GS/CB		88.07	15.53	12266	1227	102.2	10.2
56 St. Johnsbury			GS/CB		59.52	5.86	4952	4952	41.3	41.3

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
39 St. Johnsbury	0.03	FALSE	$49,400		$452	$29,596	CWIP, SRF, LISFF, OTHER	13	$5,924
40 St. Johnsbury	0.25	FALSE					CWIP, SRF, LISFF, OTHER	124	$56,996
41 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	26	$11,741
42 St. Johnsbury	0.09	FALSE					CWIP, SRF, LISFF, OTHER	45	$20,807
43 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	52	$23,864
44 St. Johnsbury	0.17	FALSE					CWIP, SRF, LISFF, OTHER	85	$39,268
45 St. Johnsbury	0.03	FALSE		$5,000	$53	$6,334	CWIP, SRF, LISFF, OTHER	13	$6,163
46 St. Johnsbury	0.10	0.21					CWIP, SRF, LISFF, OTHER	50	$22,774
47 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	18	$8,359
48 St. Johnsbury	0.08	FALSE					CWIP, SRF, LISFF, OTHER	42	$19,166
49 St. Johnsbury	0.15	FALSE					CWIP, SRF, LISFF, OTHER	73	$33,709
50 St. Johnsbury	0.31	FALSE	$242,587		$19	$2,720	CWIP, SRF, LISFF, OTHER	157	$72,100
51 St. Johnsbury	0.06	FALSE					CWIP, SRF, LISFF, OTHER	30	$13,805
52 St. Johnsbury	0.02	FALSE					CWIP, SRF, LISFF, OTHER	8	$3,839
53 St. Johnsbury	0.17	FALSE					CWIP, SRF, LISFF, OTHER	86	$39,568
54 St. Johnsbury	0.16	FALSE					CWIP, SRF, LISFF, OTHER	80	$36,835
55 St. Johnsbury	0.69	FALSE	$315,454		$16	$1,861	CWIP, SRF, LISFF, OTHER	347	$159,610
56 St. Johnsbury	0.28	0.38					CWIP, SRF, LISFF, OTHER	140	$64,440

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
57 St. Johnsbury			OF/GS		25.20	26.82	5845	5845	48.7	48.7
58 St. Johnsbury			CB/SWPPP	5407-9003	3.70	47.17	1839	1839	15.3	15.3
59 St. Johnsbury			CB/SWPPP	5407-9003	1.65	88.00	1625	1625	13.5	13.5
60 St. Johnsbury			CB/SWPPP	5407-9003	1.09	62.74	736	736	6.1	6.1
61 St. Johnsbury			CB/GS/OF		137.60	4.90	10901	10901	90.8	90.8
62 St. Johnsbury			GS/CB		19.31	19.37	3244	3244	27.0	27.0
63 St. Johnsbury			GS/CB	5340-9010	7.42	17.93	582	582	6.5	6.5
64 St. Johnsbury			GS/CB	5340-9010	6.99	6.09	321	321	3.6	3.6
65 St. Johnsbury			GS/CB	5340-9010	2.24	18.62	181	181	2.0	2.0
66 St. Johnsbury			GS/CB	5340-9010	2.81	28.96	357	357	4.0	4.0
67 St. Johnsbury		Implement Pleasant St CS implementation project	GS/CB		496.17	5.56	40648	8130	338.7	203.2
68 St. Johnsbury		Implement Pleasant St CS implementation project	IG/CB		3.81	48.85	1804	180	15.0	1.5
69 St. Johnsbury			CB/GS		16.87	24.12	3503	3503	29.2	29.2
70 St. Johnsbury			GS/CB		25.34	28.95	3760	3760	31.3	31.3
71 St. Johnsbury			CB		0.08	96.99	95	95	0.8	0.8
72 St. Johnsbury			CB		1.85	76.53	1815	1815	15.1	15.1

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
57 St. Johnsbury	0.33	FALSE					CWIP, SRF, LISFF, OTHER	165	$76,061
58 St. Johnsbury	0.12	FALSE					CWIP, SRF, LISFF, OTHER	58	$26,587
59 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	51	$23,489
60 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	23	$10,636
61 St. Johnsbury	0.62	0.74					CWIP, SRF, LISFF, OTHER	308	$141,852
62 St. Johnsbury	0.18	FALSE					CWIP, SRF, LISFF, OTHER	92	$42,216
63 St. Johnsbury	0.05	0.15					CWIP, SRF, LISFF, OTHER	27	$12,625
64 St. Johnsbury	0.03	0.05					CWIP, SRF, LISFF, OTHER	15	$6,962
65 St. Johnsbury	0.02	0.05					CWIP, SRF, LISFF, OTHER	9	$3,934
66 St. Johnsbury	0.03	0.09					CWIP, SRF, LISFF, OTHER	17	$7,751
67 St. Johnsbury	2.30	3.03					CWIP, SRF, LISFF, OTHER	1150	$528,948
68 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	51	$23,478
69 St. Johnsbury	0.20	FALSE					CWIP, SRF, LISFF, OTHER	99	$45,580
70 St. Johnsbury	0.30	FALSE					CWIP, SRF, LISFF, OTHER	152	$69,907
71 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	3	$1,242
72 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	51	$23,621

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
73 St. Johnsbury			OF		13.05	28.07	4270	4270	35.6	35.6
74 St. Johnsbury			OF		11.04	18.36	1768	1768	14.7	14.7
75 St. Johnsbury			CB/OF		4.49	23.66	915	915	7.6	7.6
76 St. Johnsbury			CB/GS/OF		95.07	12.01	11021	11021	91.8	91.8
77 St. Johnsbury			CB/GS		1.31	66.06	1038	1038	8.7	8.7
78 St. Johnsbury			CB/GS		0.86	72.71	756	756	6.3	6.3
79 St. Johnsbury			CB/GS		6.52	34.31	2598	2598	21.6	21.6
80 St. Johnsbury	4		CB/GS/WP	7479-INDS/5304-INDS	241.57	7.31	17136	17136	190.4	190.4
81 St. Johnsbury	4		GS/OF		6.57	15.63	920	920	7.7	7.7
82 St. Johnsbury			CB/GS	7479-INDS	0.66	91.24	756	756	6.3	6.3
83 St. Johnsbury			CB/GS	3683-9010	10.04	25.38	1468	1468	13.8	13.8
84 St. Johnsbury			CB/GS	3185-9010	1.11	99.44	1391	1391	11.6	11.6
85 St. Johnsbury	4	Bioretention area in parking median	BRA/CB/GS	3185-9010	1.13	89.88	964	386	9.0	6.3
86 St. Johnsbury	4	Bioretention area in parking median	BRA/CB/GS	3185-9010	0.83	86.95	673	269	6.3	4.4
87 St. Johnsbury			CB/GS		10.41	42.06	5103	5103	42.5	42.5
88 St. Johnsbury			CB		0.47	45.90	251	251	2.1	2.1
89 St. Johnsbury			CB/GS		1.78	69.68	1499	1499	12.5	12.5
90 St. Johnsbury			CB/GS/CR	5977-9010	8.10	37.72	1433	1433	15.9	15.9
91 St. Johnsbury			CB/OF	5977-9010	6.09	29.07	1389	1389	12.2	12.2
92 St. Johnsbury	4		CB/WP/IG/CR/SF/SB(2)	5099-9010/5304-9015.A5/ 5304-INDS	180.55	9.17	5511	5511	80.4	80.4
93 St. Johnsbury			CB/OF		28.14	28.57	6991	6991	58.3	58.3
94 St. Johnsbury			GS/CB/IB		9.57	27.38	2270	2270	18.9	18.9
95 St. Johnsbury	1	Combine with 3031	OF		1102.38	2.81	79260	79260	660.5	660.5

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
73 St. Johnsbury	0.24	FALSE					CWIP, SRF, LISFF, OTHER	121	$55,571
74 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	50	$23,013
75 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	26	$11,902
76 St. Johnsbury	0.62	1.26					CWIP, SRF, LISFF, OTHER	312	$143,413
77 St. Johnsbury	0.06	FALSE					CWIP, SRF, LISFF, OTHER	29	$13,513
78 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	21	$9,839
79 St. Johnsbury	0.15	FALSE					CWIP, SRF, LISFF, OTHER	73	$33,805
80 St. Johnsbury	1.62	1.94					CWIP, SRF, LISFF, OTHER	808	$371,641
81 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	26	$11,967
82 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	21	$9,834
83 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	52	$23,885
84 St. Johnsbury	0.08	FALSE					CWIP, SRF, LISFF, OTHER	39	$18,105
85 St. Johnsbury	0.07	FALSE	$15,679		$27	$4,220	CWIP, SRF, LISFF, OTHER	34	$15,679
86 St. Johnsbury	0.05	FALSE	$10,951		$27	$4,220	CWIP, SRF, LISFF, OTHER	24	$10,951
87 St. Johnsbury	0.29	FALSE					CWIP, SRF, LISFF, OTHER	144	$66,409
88 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	7	$3,264
89 St. Johnsbury	0.08	FALSE					CWIP, SRF, LISFF, OTHER	42	$19,512
90 St. Johnsbury	0.14	FALSE					CWIP, SRF, LISFF, OTHER	68	$31,088
91 St. Johnsbury	0.09	FALSE					CWIP, SRF, LISFF, OTHER	44	$20,088
92 St. Johnsbury	0.78	1.82					CWIP, SRF, LISFF, OTHER	390	$179,281
93 St. Johnsbury	0.40	FALSE					CWIP, SRF, LISFF, OTHER	198	$90,974
94 St. Johnsbury	0.13	FALSE					CWIP, SRF, LISFF, OTHER	64	$29,539
95 St. Johnsbury	4.48	3.41					CWIP, SRF, LISFF, OTHER	2242	$1,031,398

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
96 St. Johnsbury			GS/CB		4.40	10.86	480	480	4.0	4.0
97 St. Johnsbury			DW/CB/GS/WP/GS		24.05	24.85	4210	4210	46.8	46.8
98 St. Johnsbury			CB/OF		4.95	47.04	2731	2731	22.8	22.8
99 St. Johnsbury	4	Dry wells for roof runoff at rear of building	DW/CB/OGS	3284-9010	47.18	21.25	9553	5732	89.6	53.7
100 St. Johnsbury	4	Extended Detention Micropool north of parking lot	EDPMP/CB/GS	3284-9010	17.40	39.83	6450	2580	60.5	30.2
101 St. Johnsbury			OF		4.06	44.28	1695	1695	14.1	14.1
102 St. Johnsbury	4		GS/OF		889.42	3.46	65782	65782	548.2	548.2
103 St. Johnsbury	4	Upgrade sediment basin to 2017 standards	MOD/SB/CB/GS	3642-9010	39.98	21.31	2890	1734	32.1	25.7
104 St. Johnsbury	4		CB		9.84	25.78	2188	2188	18.2	18.2
105 St. Johnsbury			CB/GS/IG/CR	4369-9010	20.89	12.22	351	351	8.8	8.8
106 St. Johnsbury			CB/GS/IG(4)/CR	4369-9010	14.69	16.53	290	290	7.3	7.3
107 St. Johnsbury	4	Extended Detention Micropool or Infiltration Basin north of Gordon Mills Rd	EDPMP/CB/GS/SWPPP	5037-9010/ 5037-9003	265.68	9.45	32738	9821	288.0	187.2
108 St. Johnsbury			CB		0.48	8.73	47	47	0.4	0.4
109 St. Johnsbury			CB		0.86	43.51	351	351	2.9	2.9
110 St. Johnsbury			OF		12.24	19.35	2054	2054	17.1	17.1
111 St. Johnsbury			OF/CB		27.35	5.73	2260	2260	18.8	18.8
112 St. Johnsbury			GS		3.52	41.37	1697	1697	14.1	14.1
113 St. Johnsbury	4		CB/OF		9.84	49.01	5664	5664	47.2	47.2
114 St. Johnsbury			CB/GS		10.07	45.18	5322	5322	44.4	44.4
115 St. Johnsbury			CB		4.73	49.57	2753	2753	22.9	22.9
116 St. Johnsbury			CB		0.35	48.32	199	199	1.7	1.7
117 St. Johnsbury			OF		10.60	41.36	4066	4066	33.9	33.9

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
96 St. Johnsbury	0.03	0.05					CWIP, SRF, LISFF, OTHER	14	$6,248
97 St. Johnsbury	0.40	FALSE					CWIP, SRF, LISFF, OTHER	199	$91,310
98 St. Johnsbury	0.15	FALSE					CWIP, SRF, LISFF, OTHER	77	$35,536
99 St. Johnsbury	0.68	FALSE		$15,000	$4	$328	CWIP, SRF, LISFF, OTHER	338	$155,396
100 St. Johnsbury	0.46	FALSE	$139,102		$36	$3,764	CWIP, SRF, LISFF, OTHER	228	$104,922
101 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	48	$22,058
102 St. Johnsbury	3.72	3.39					CWIP, SRF, LISFF, OTHER	1861	$856,015
103 St. Johnsbury	0.27	FALSE	$47,006		$41	$3,253	CWIP, SRF, LISFF, OTHER	136	$62,675
104 St. Johnsbury	0.12	FALSE					CWIP, SRF, LISFF, OTHER	62	$28,478
105 St. Johnsbury	0.10	0.28					CWIP, SRF, LISFF, OTHER	50	$22,855
106 St. Johnsbury	0.08	0.27					CWIP, SRF, LISFF, OTHER	41	$18,896
107 St. Johnsbury	2.06	FALSE	$627,539		$27	$5,412	CWIP, SRF, LISFF, OTHER	1029	$473,344
108 St. Johnsbury	0.00	FALSE					CWIP, SRF, LISFF, OTHER	1	$607
109 St. Johnsbury	0.02	FALSE					CWIP, SRF, LISFF, OTHER	10	$4,562
110 St. Johnsbury	0.12	FALSE					CWIP, SRF, LISFF, OTHER	58	$26,731
111 St. Johnsbury	0.13	FALSE					CWIP, SRF, LISFF, OTHER	64	$29,413
112 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	48	$22,084
113 St. Johnsbury	0.32	FALSE					CWIP, SRF, LISFF, OTHER	160	$73,707
114 St. Johnsbury	0.30	FALSE					CWIP, SRF, LISFF, OTHER	151	$69,257
115 St. Johnsbury	0.16	FALSE					CWIP, SRF, LISFF, OTHER	78	$35,826
116 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	6	$2,590
117 St. Johnsbury	0.23	FALSE					CWIP, SRF, LISFF, OTHER	115	$52,908

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
118 St. Johnsbury			OF		1.21	79.79	1229	1229	10.2	10.2
119 St. Johnsbury			OF		5.38	38.95	2435	2435	20.3	20.3
120 St. Johnsbury	4		OF/CB		9.45	46.45	5138	5138	42.8	42.8
121 St. Johnsbury	4		OF		86.46	7.46	7834	7834	65.3	65.3
122 St. Johnsbury	2	Add DA 3027 when separated.	CB		9.62	40.51	638	638	5.3	5.3
3001 St. Johnsbury	1	Replace combined sewer basins with separated basins.	EDPMP/OF		24.97	32.60	9453	6617	78.8	55.1
3002 St. Johnsbury	2	Treat 1/2 sewershed in Extended Detention Pond on Town land at Bay St. - Weeks Ct. Combine with DA 50.	EDPMP/CB		27.05	53.12	16970	8485	141.4	70.7
3003 St. Johnsbury	1	Replace combined sewer basins with separated basins.	OF		14.57	6.38	1245	1245	10.4	10.4
3004 St. Johnsbury	1	Replace combined sewer basins with separated basins. After separation combine with DA 55 and DA 3032.	CB/OF		19.63	37.60	8576	858	71.5	7.1
3005 St. Johnsbury	2	Replace combined sewer basins with separated basins. After separation add underground infiltration basin north of 185 Sunset Dr.	CB/OF		4.87	27.91	1180	118	9.8	1.0
3006 St. Johnsbury			CB/OF		0.97	50.59	479	479	4.0	4.0
3007 St. Johnsbury	2	Eliminate or replace combined sewer basin and add dry well in Ramsey Park or discharge to River.	CB/OF		0.46	91.86	532	53	4.4	0.4
3008 St. Johnsbury	1	Eliminate or replace combined sewer basin with dry well.	CB/OF		0.15	76.54	133	13	1.1	0.1
3009 St. Johnsbury	1	Eliminate or replace combined sewer basin with dry well.	CB/OF		0.12	74.65	99	10	0.8	0.1
3010 St. Johnsbury	1	Replace combined sewer basins with separated basins.	CB/OF		2.63	35.50	837	837	7.0	7.0

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
118 St. Johnsbury	0.07	FALSE					CWIP, SRF, LISFF, OTHER	35	$15,997
119 St. Johnsbury	0.14	FALSE					CWIP, SRF, LISFF, OTHER	69	$31,691
120 St. Johnsbury	0.29	FALSE					CWIP, SRF, LISFF, OTHER	145	$66,859
121 St. Johnsbury	0.44	FALSE					CWIP, SRF, LISFF, OTHER	222	$101,946
122 St. Johnsbury	0.26	FALSE					CWIP, SRF, LISFF, OTHER	128	$59,023
3001 St. Johnsbury	0.53	FALSE					CWIP, SRF, LISFF, OTHER	267	$123,009
3002 St. Johnsbury	0.96	FALSE					CWIP, SRF, LISFF, OTHER	480	$220,824
3003 St. Johnsbury	0.07	FALSE					CWIP, SRF, LISFF, OTHER	35	$16,205
3004 St. Johnsbury	0.49	FALSE					CWIP, SRF, LISFF, OTHER	243	$111,593
3005 St. Johnsbury	0.07	FALSE	$61,078		$58	$6,901	CWIP, SRF, LISFF, OTHER	33	$15,357
3006 St. Johnsbury	0.03	0.05					CWIP, SRF, LISFF, OTHER	14	$6,232
3007 St. Johnsbury	0.03	FALSE		$6,000	$13	$1,505	CWIP, SRF, LISFF, OTHER	15	$6,919
3008 St. Johnsbury	0.01	FALSE		$6,000	$50	$5,994	CWIP, SRF, LISFF, OTHER	4	$1,737
3009 St. Johnsbury	0.01	FALSE		$6,000	$67	$8,082	CWIP, SRF, LISFF, OTHER	3	$1,288
3010 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	24	$10,887

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations											
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
3011 St. Johnsbury	1	Replace combined sewer basins with separated basins.	CB/ OF		0.40	54.32	217	217	1.8	1.8
3012 St. Johnsbury	2,4	Replace combined sewer basins with separated basins. After separation combine with DA 21. Add swirl separator.	CB/ OF		28.11	62.96	21205	6361	176.7	159.0
3013 St. Johnsbury	1	Replace combined sewer basin with separated basin and 180 feet of storm drain. Combine with DA 26.	CB/OF/ VS(2)		0.89	91.14	978	391	8.1	7.3
3014 St. Johnsbury	2	Convert combined basin to bioretention or rain garden at Fairbanks Museum. Replace combined basin with separated basins on Thadeus La.	BRA/ OF		0.40	63.48	306	61	2.6	1.0
3016 St. Johnsbury	1	Replace combined sewer basins with separated basins. Combine with DA 23.	O F		1.08	82.25	1095	219	9.1	5.5
3017 St. Johnsbury	1	Replace combined sewer basins with separated basins.	O F		1.49	60.15	926	926	7.7	7.7
3018 St. Johnsbury	2	Convert combined basins to dry wells or eliminate and on Bay Street replace combined basins with separated basins.	CB/ OF		12.13	77.73	11547	11547	96.2	96.2
3019 St. Johnsbury	1	Replace combined sewer basins with separated basins. After separation add EDPMP on Chaloux property on Railroad St.	EDPMP/ OF		14.60	46.78	8001	1600	66.7	40.0
3020 St. Johnsbury	1	Replace combined sewer basin with separated basin and 400 meters of storm drain.	O F		0.27	36.93	118	118	1.0	1.0

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	**Water Quality Volume (Acre-Feet)**	**Channel Protection (Acre-Feet)**	**Estimated Basin Construction Cost**	**Estimated Other BMP Construction Cost**	**Cost of Sediment Removal Per Pound (based on annual sediment load)**	**Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)**	**Assistance Program**	**# LID-Roof Raingardens to Treat Water Quality Volume**	**Raingarden Cost**
3011 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	6	$2,830
3012 St. Johnsbury	1.20	FALSE		$70,000	$4	$3,457	CWIP, SRF, LISFF, OTHER	600	$275,936
3013 St. Johnsbury	0.06	FALSE		$15,000	$26	$18,409	CWIP, SRF, LISFF, OTHER	28	$12,724
3014 St. Johnsbury	0.02	FALSE	$498		$2	$325	CWIP, SRF, LISFF, OTHER	9	$3,987
3016 St. Johnsbury	0.06	FALSE					CWIP, SRF, LISFF, OTHER	31	$14,247
3017 St. Johnsbury	0.05	FALSE					CWIP, SRF, LISFF, OTHER	26	$12,051
3018 St. Johnsbury	0.65	FALSE					CWIP, SRF, LISFF, OTHER	327	$150,258
3019 St. Johnsbury	0.45	FALSE	$138,029		$22	$4,891	CWIP, SRF, LISFF, OTHER	226	$104,113
3020 St. Johnsbury	0.01	FALSE		$15,000			CWIP, SRF, LISFF, OTHER	3	$1,534

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations											
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
3021 St. Johnsbury	1	Eliminate or replace combined basins with separated basins and 140 meters of storm drain.	OF		0.80	72.34	639	639	5.3	5.3
3022 St. Johnsbury	1	Eliminate or replace combined basins with separated basins and 100 meters of storm drain.	OF		0.60	67.91	495	495	4.1	4.1
3023 St. Johnsbury	1	Eliminate or connect combined basin with 80 meters of storm drain to DA 26	OF		0.42	75.59	356	142	3.0	2.7
3024 St. Johnsbury			DW/OF		1.96	41.74	229	229	1.9	1.9
3025 St. Johnsbury	1	Replace combined sewer basin with separated basin and add green infrastructure.	GSI/OF		6.48	17.51	995	299	2.5	2.5
3027 St. Johnsbury	1	Eliminate combined basin and add to DA 122	OF		0.17	79.31	150	150	1.3	1.3
3028 St. Johnsbury		Implement Pleasant St CS implementation project	IG/CB/OF		3.04	49.51	1770	177	14.7	1.5
3029 St. Johnsbury	1	Implement Pleasant St CS implementation project. Add GSI.	GSI/CB/OF		5.99	51.50	3039	304	25.3	2.5
3030 St. Johnsbury	1	Replace combined sewer basins with separated basins and add green infrastructure.	GSI/CB/OF		1.16	16.91	173	17	1.4	0.1
3031 St. Johnsbury	1	Replace combined sewer basin with separated basin and combine with 95.	GSI/CB/OF		1.59	31.66	442	44	3.7	0.4
3032 St. Johnsbury	1	Replace combined sewer basins with separated basins. After separation combine with DA 55 and DA 3004	IB/CB/OF		1.56	89.07	1760	176	14.7	1.5

St. Johnsbury 2019 - Subwatershed Prioritization and Recommendations									
Watershed Number	**Water Quality Volume (Acre-Feet)**	**Channel Protection (Acre-Feet)**	**Estimated Basin Construction Cost**	**Estimated Other BMP Construction Cost**	**Cost of Sediment Removal Per Pound (based on annual sediment load)**	**Cost of Phosphorus or Nitrogen Removal Per Pound (based on annual nutrient load)**	**Assistance Program**	**# LID-Roof Raingardens to Treat Water Quality Volume**	**Raingarden Cost**
3021 St. Johnsbury	0.04	FALSE		$15,000			CWIP, SRF, LISFF, OTHER	18	$8,319
3022 St. Johnsbury	0.03	FALSE		$25,000			CWIP, SRF, LISFF, OTHER	14	$6,435
3023 St. Johnsbury	0.02	FALSE		$10,000			CWIP, SRF, LISFF, OTHER	10	$4,632
3024 St. Johnsbury	0.04	FALSE					CWIP, SRF, LISFF, OTHER	22	$9,918
3025 St. Johnsbury	0.06	FALSE	$9,714		$14	$1,673	CWIP, SRF, LISFF, OTHER	28	$12,952
3027 St. Johnsbury	0.01	FALSE					CWIP, SRF, LISFF, OTHER	4	$1,954
3028 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	50	$23,026
3029 St. Johnsbury	0.17	FALSE	$29,658		$11	$1,301	CWIP, SRF, LISFF, OTHER	86	$39,544
3030 St. Johnsbury	0.01	FALSE	$1,686		$11	$1,301	CWIP, SRF, LISFF, OTHER	5	$2,249
3031 St. Johnsbury	0.03	FALSE	$4,315		$11	$1,301	CWIP, SRF, LISFF, OTHER	13	$5,754
3032 St. Johnsbury	0.10	FALSE					CWIP, SRF, LISFF, OTHER	50	$22,907

Target Maps

Showing Priority Action List Drainage Areas

And Potential Retrofit Locations

Subwatershed: 8
Action List: 1

B

18

A

5

Potential for an infiltration basin to treat runoff from subwatershed 18 before it enters the receiving water.

N

0 0.0075 0.015 0.03 Miles

St. Johnsbury, VT

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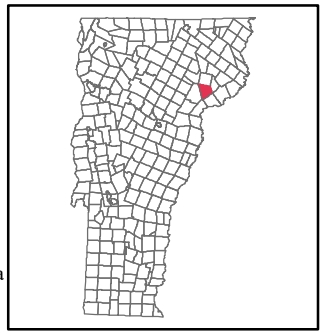

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NRCS - Soils

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SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

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DEC - WSMD - Clean Water Initiative Program
Plotted Date: 1/30/2020
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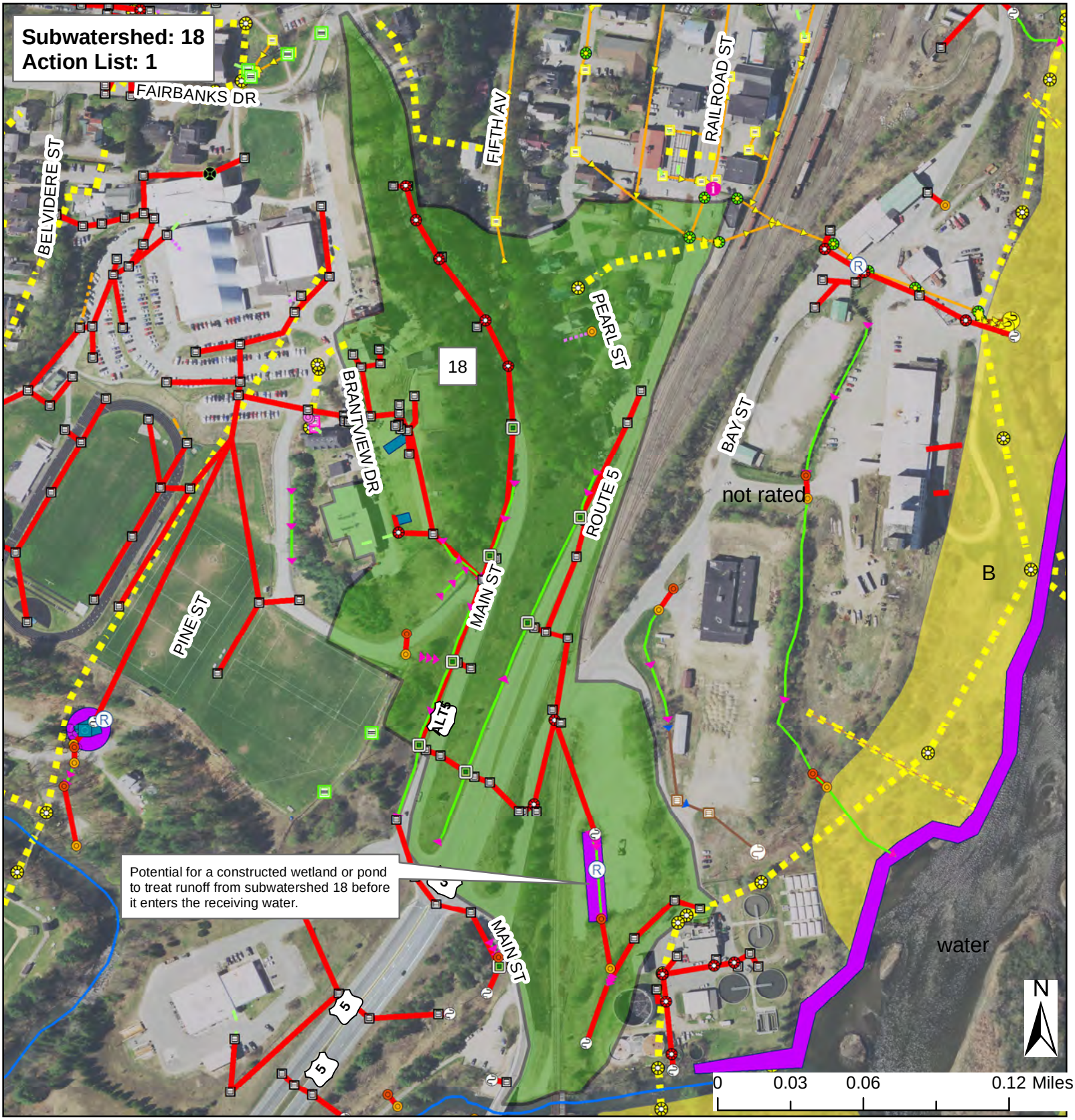

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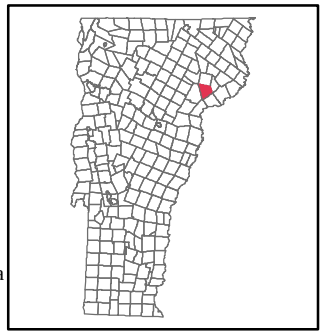

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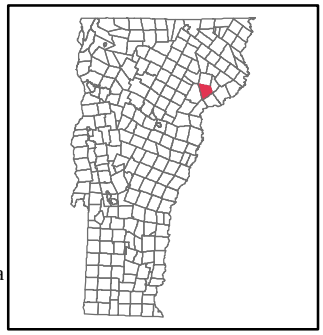

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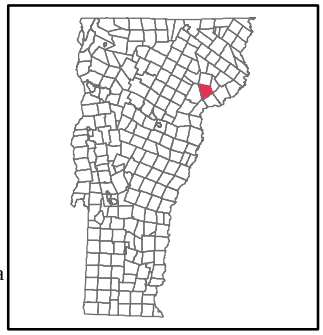

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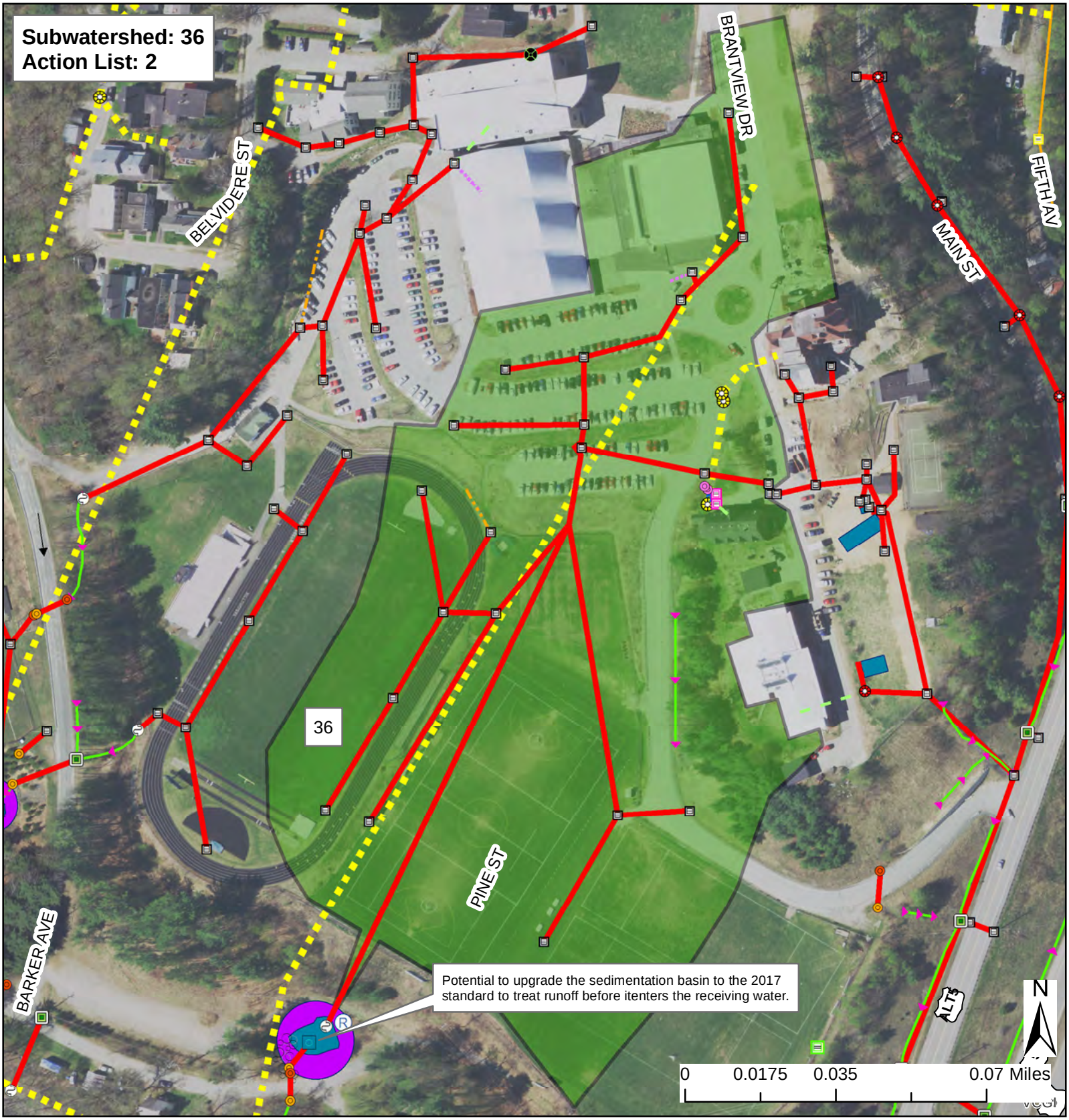

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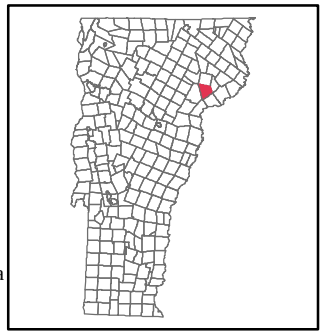

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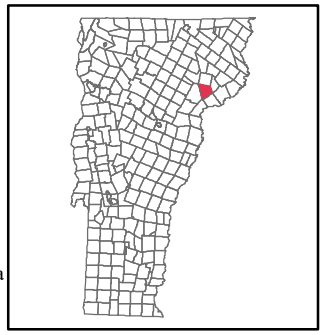

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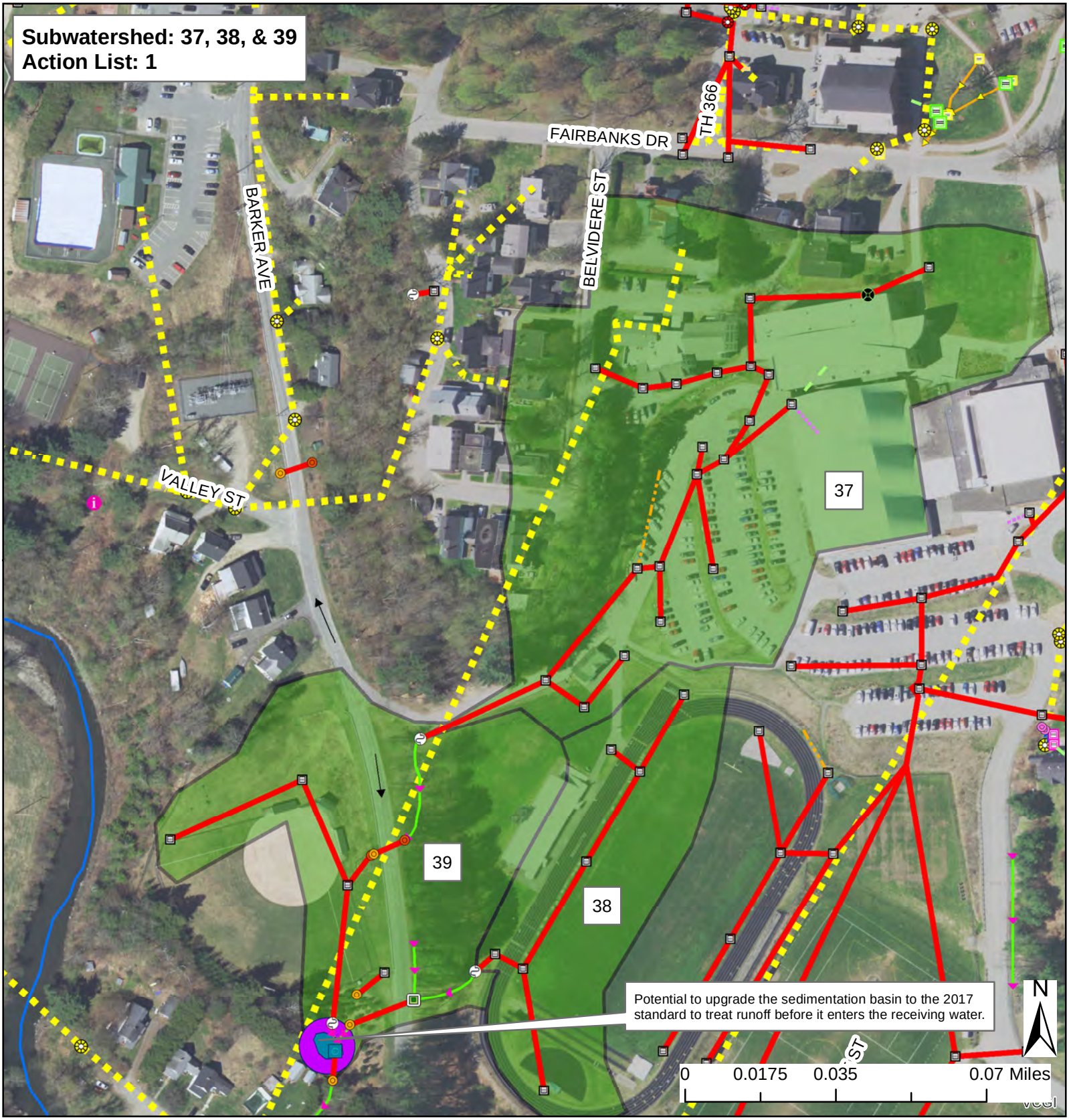

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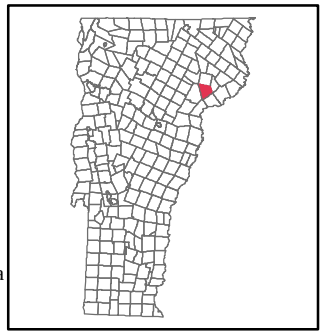

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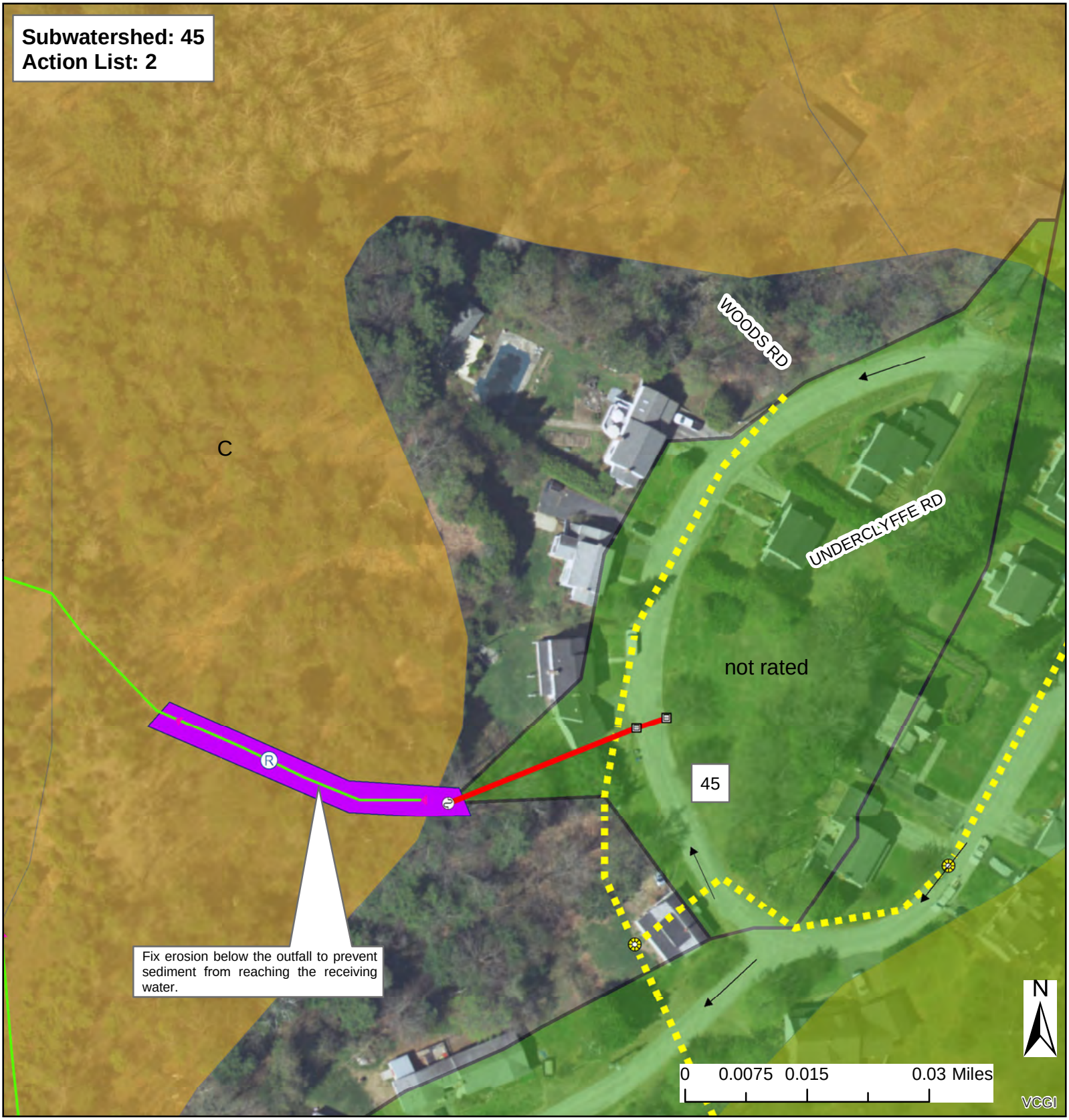

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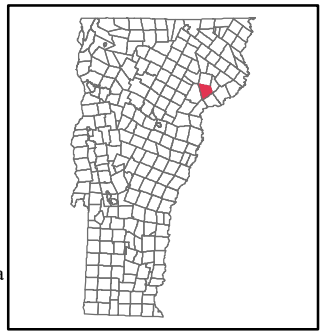

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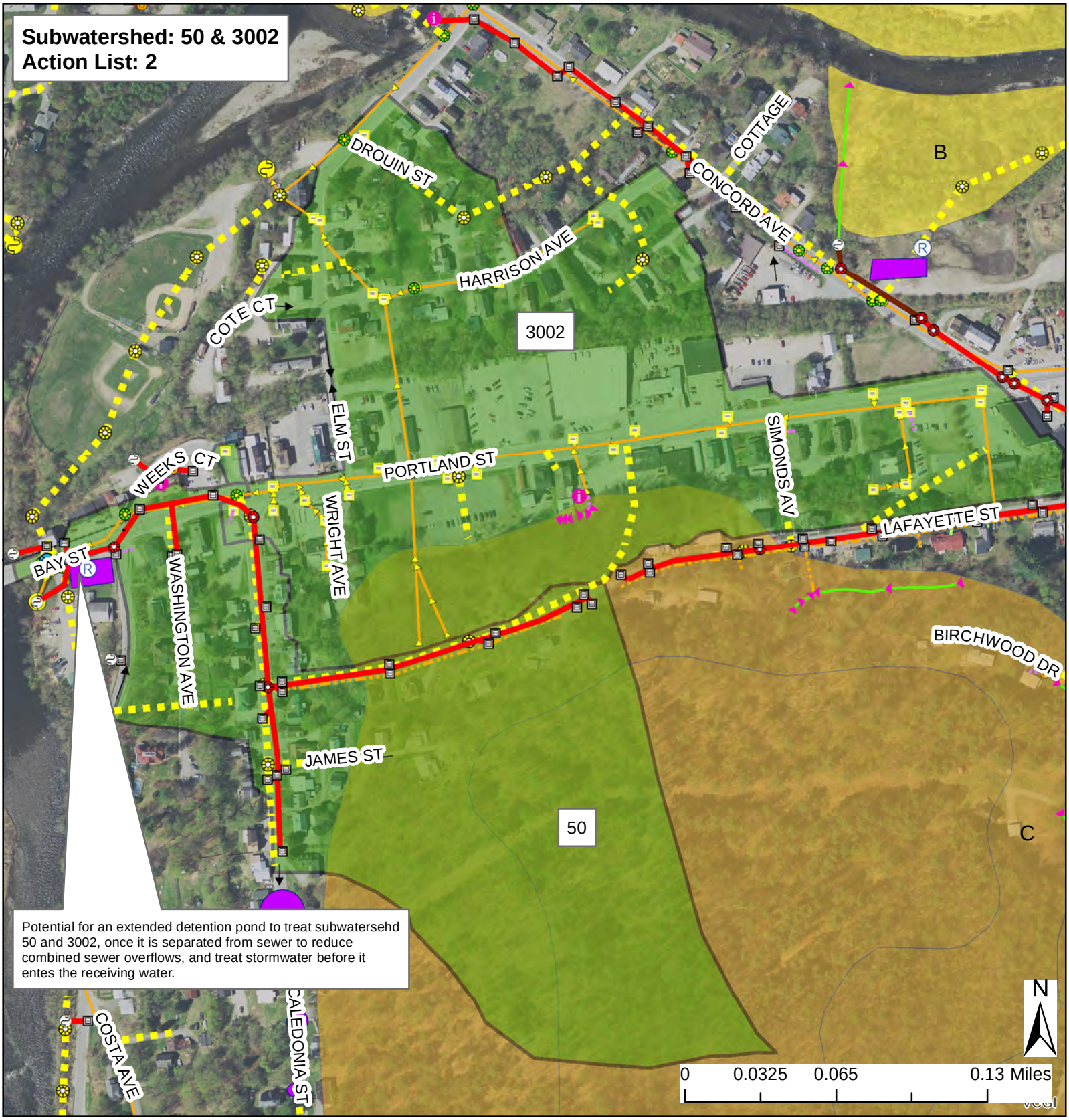

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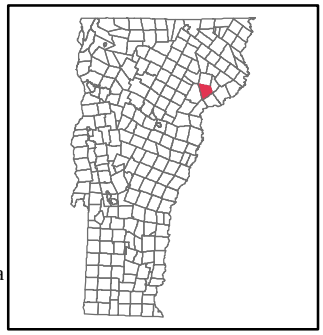

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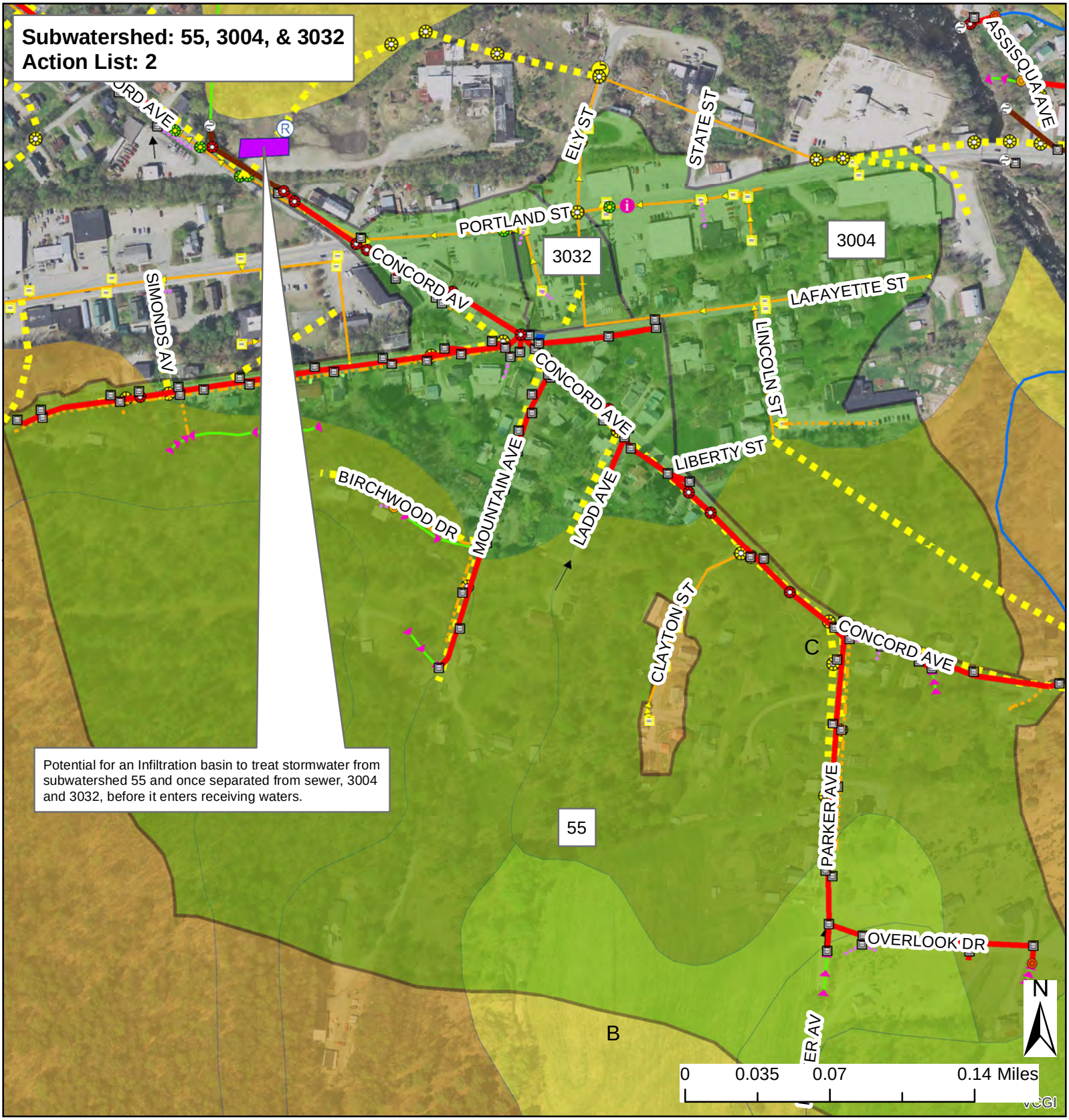

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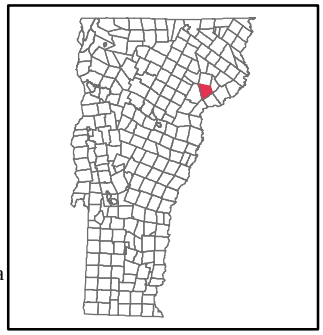

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Subwatershed: 85 & 86
Action List: 4

HOSPITAL DR

86

not rated

Potential for a bioretention area in the parking median to treat stormwater from subwatersehd 86 before it entes receiving waters.

85

Potential for a bioretention area in the parking median to treat stormwater from subwatersehd 85 before it entes receiving waters.

5

water

N

0 0.0075 0.015 0.03 Miles

VCGI

St. Johnsbury, VT

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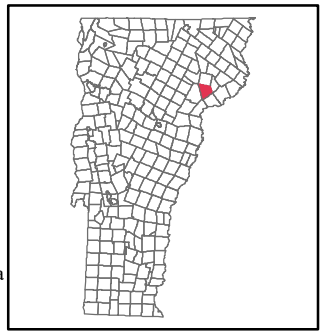

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NRCS - Soils
- A
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SubwatershedID
- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WSMD - Clean Water Initiative Program
Plotted Date: 1/30/2020
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survery
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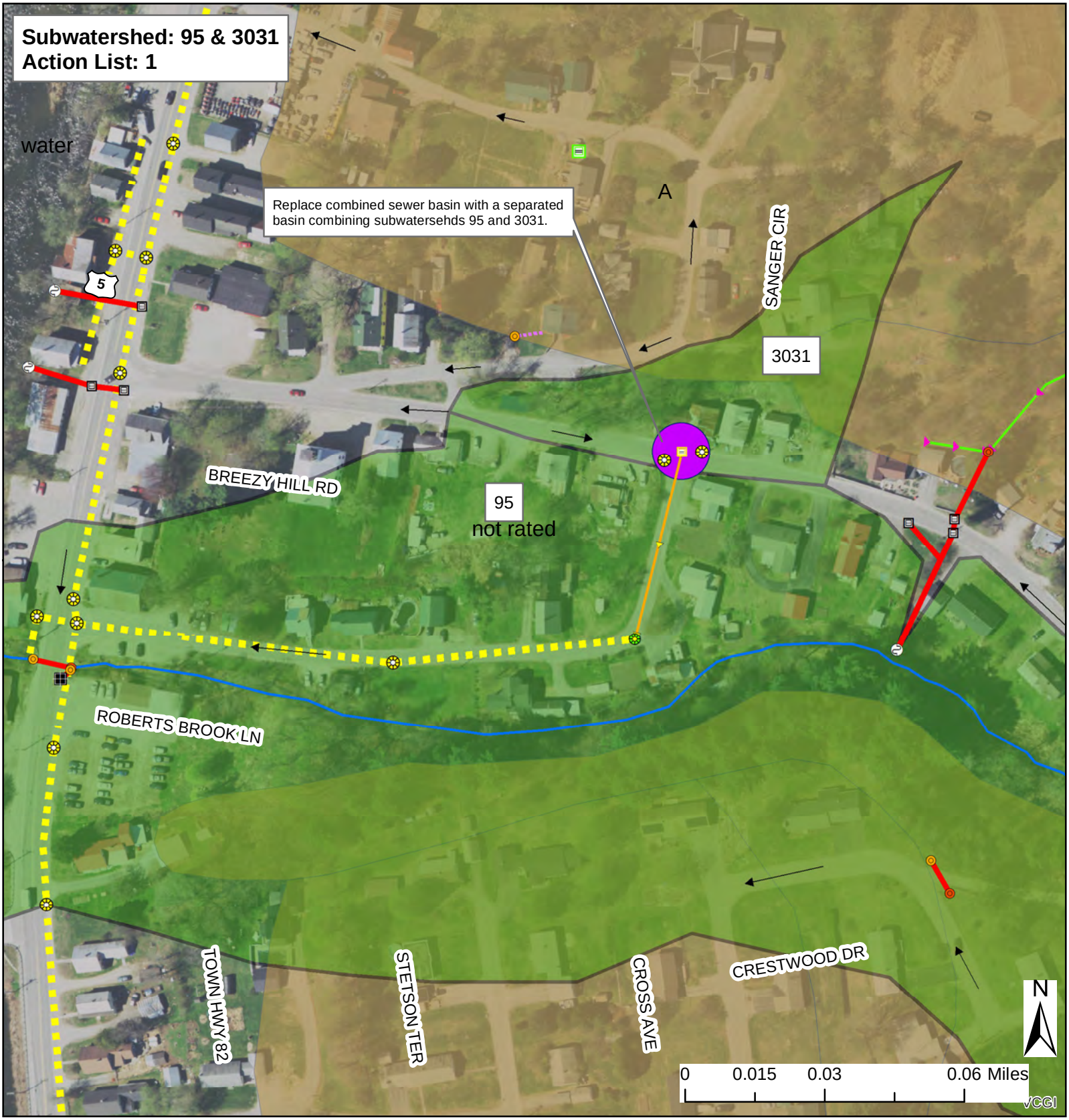

St. Johnsbury, VT

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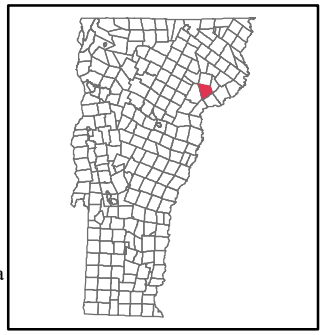

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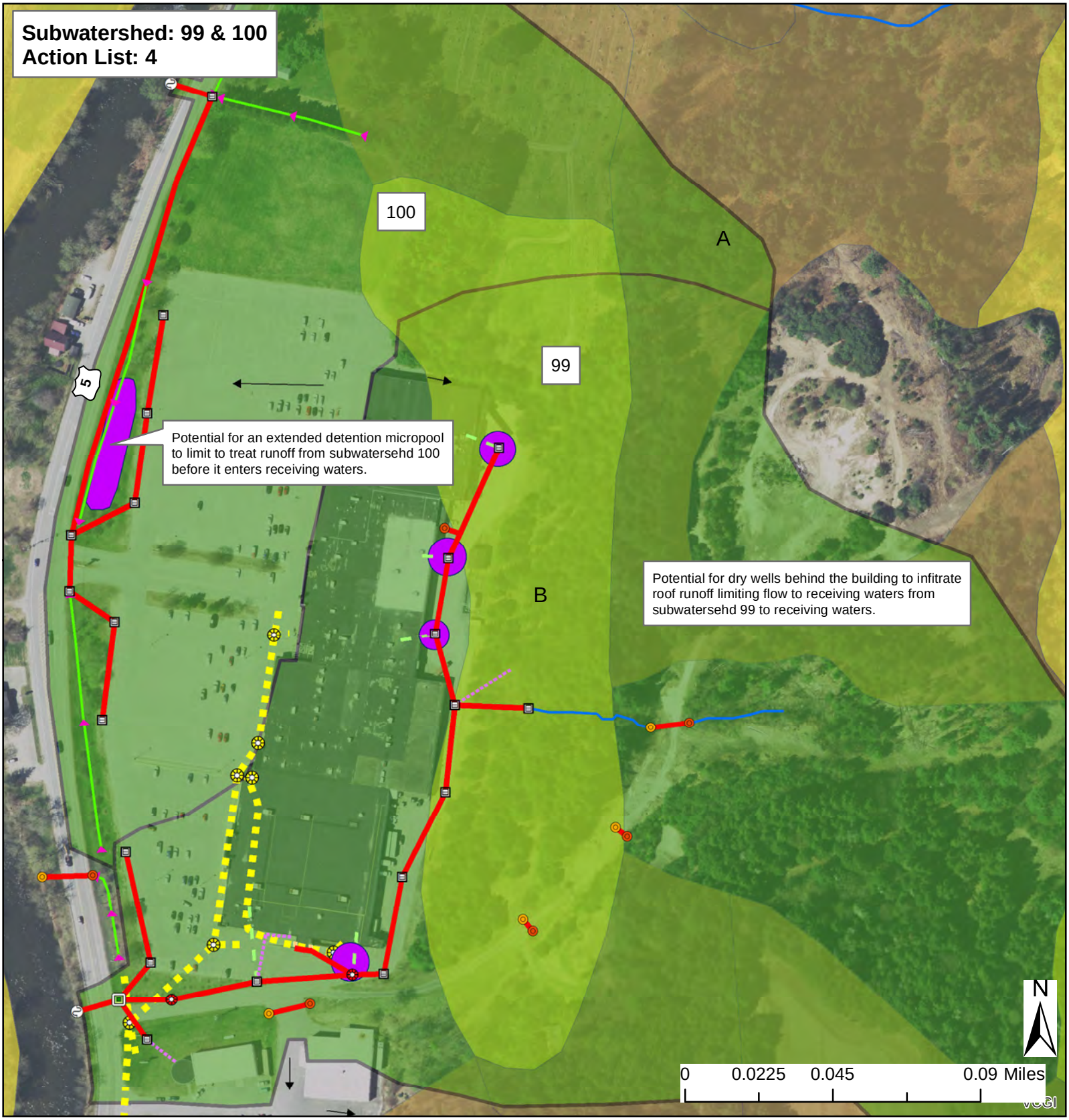

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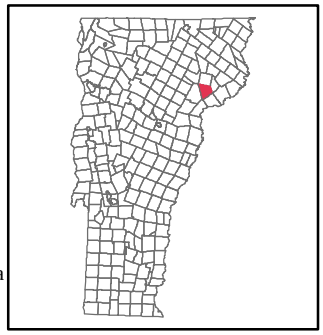

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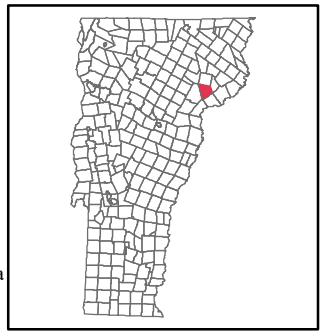

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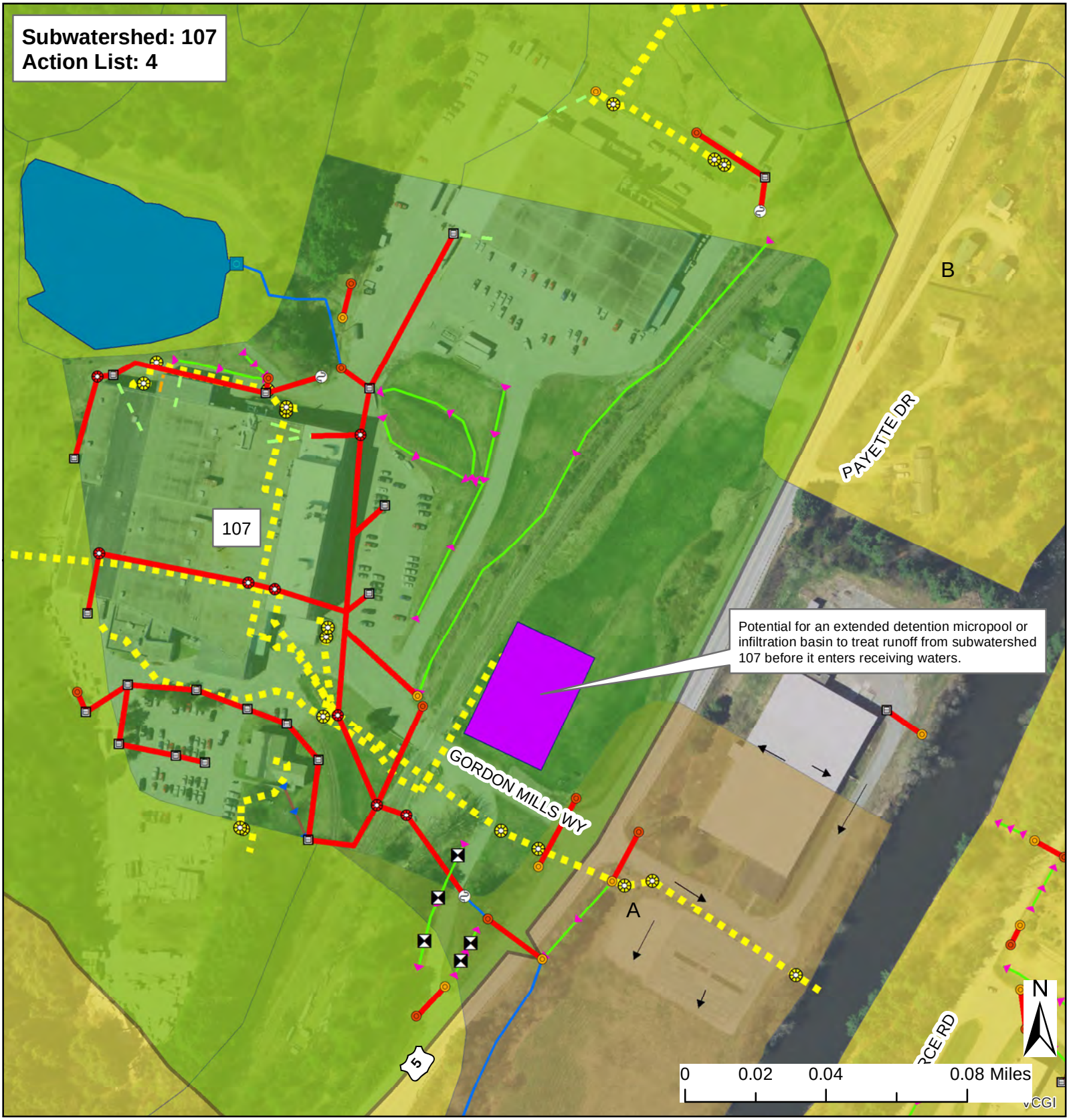

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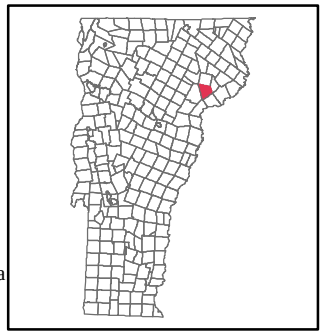

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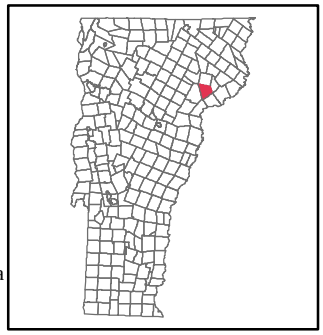

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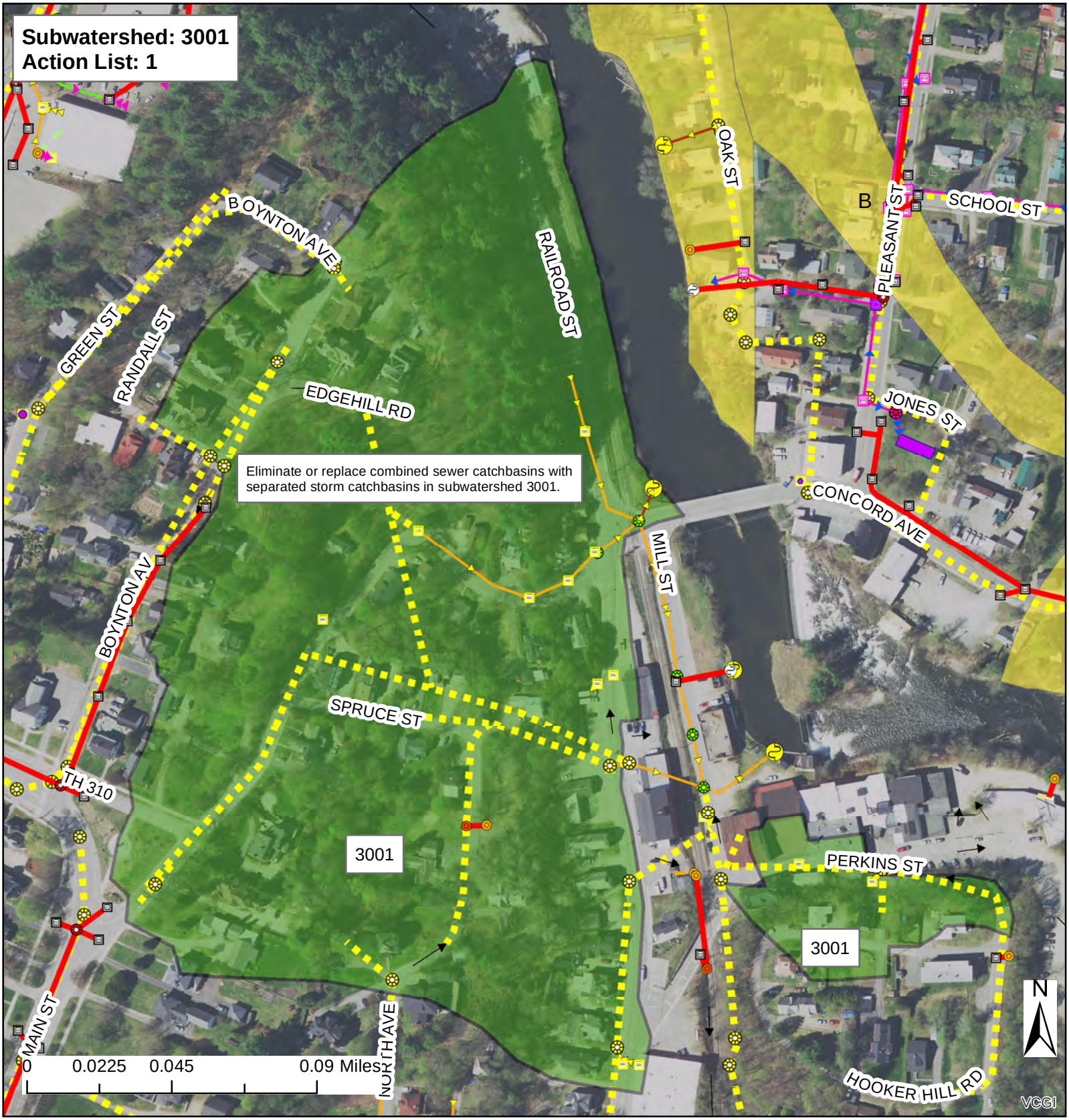

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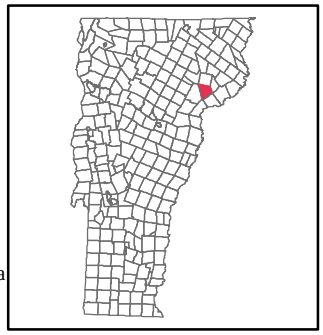

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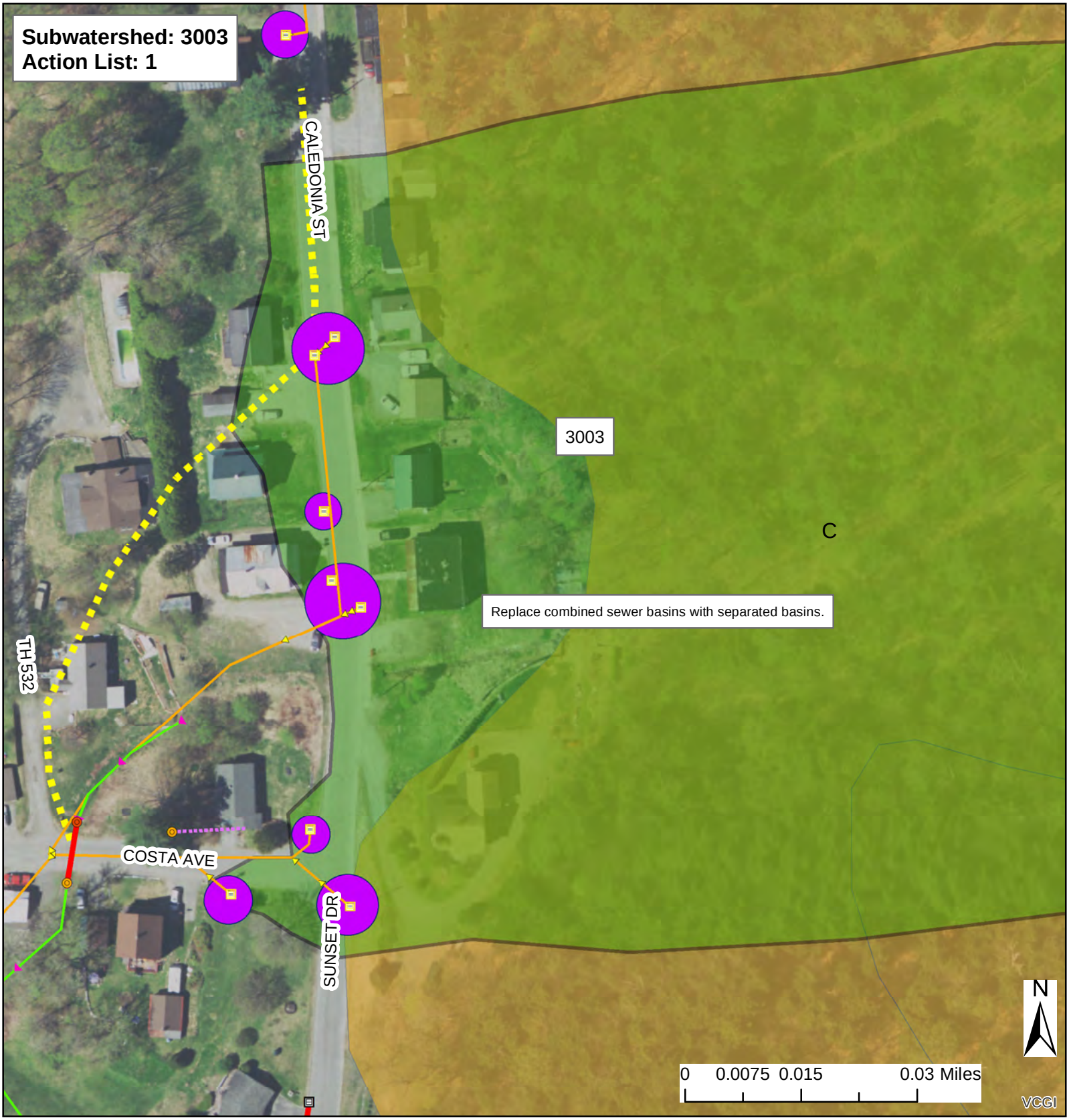

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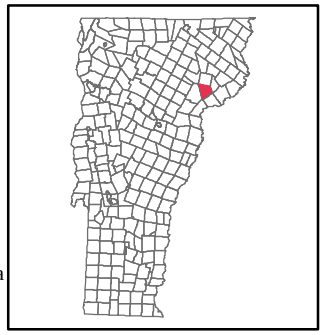

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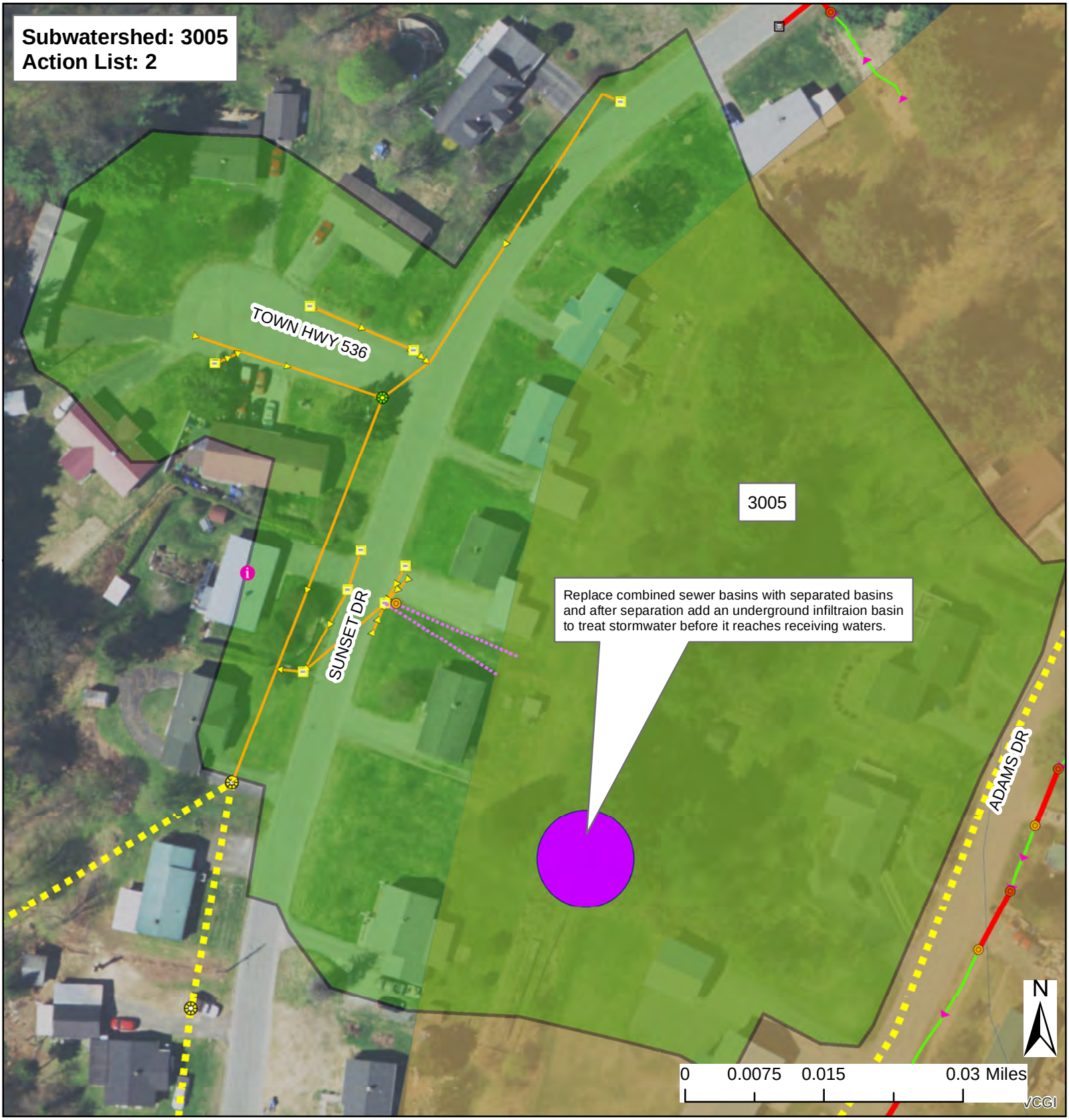

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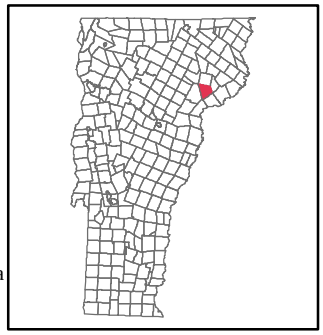

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Subwatershed: 3007
Action List: 2

B

3007

Replace combined sewer basin with separated basin.

CONCORD AVE

PLEASANT ST

N

0 0.0025 0.005 0.01 Miles

vCGI

St. Johnsbury, VT

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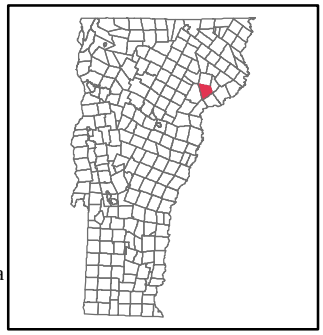
VERMONT



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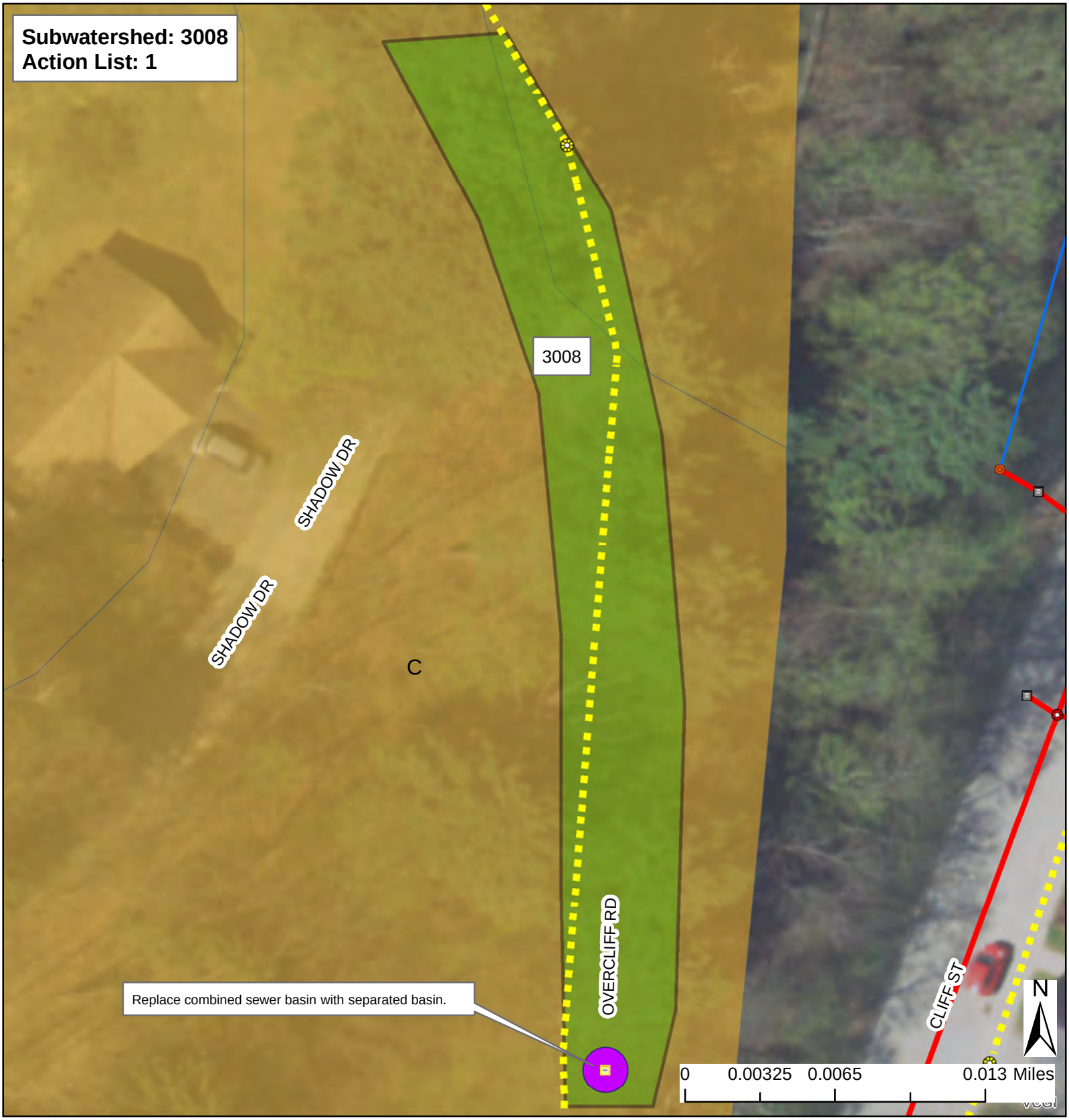

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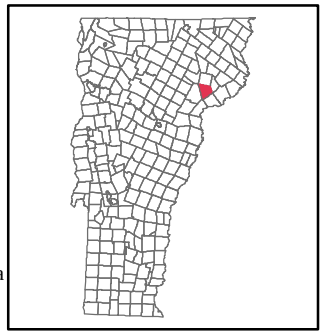

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Subwatershed: 3009
Action List: 1

3009

DUKE ST

Replace combined sewer catchbasin with separated storm catchbasin.

N

0 0.00175 0.0035 0.007 Miles

VCGI

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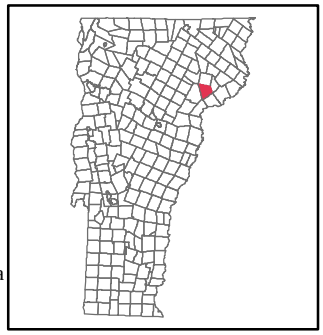

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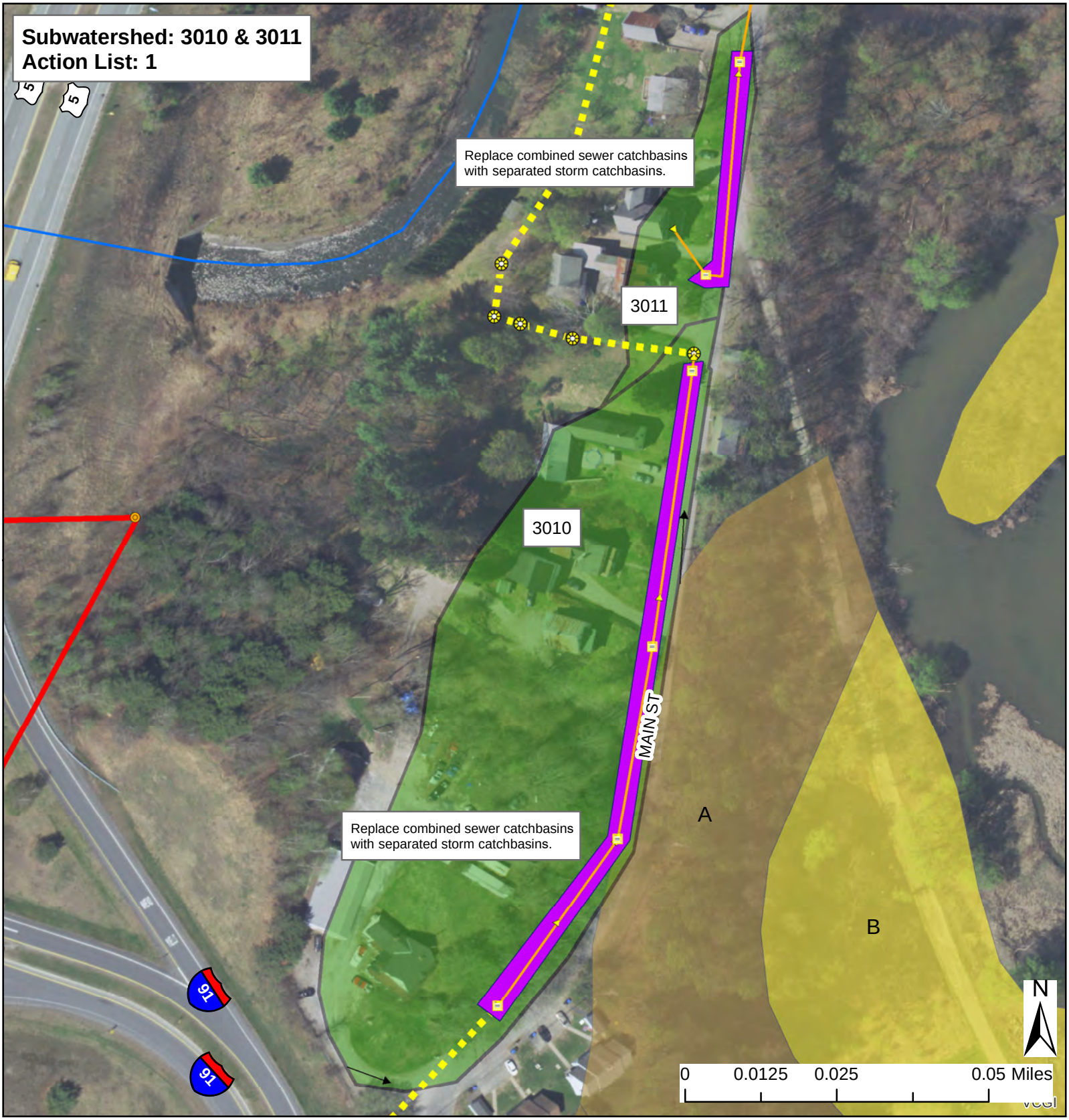

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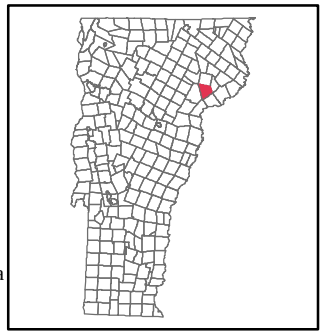

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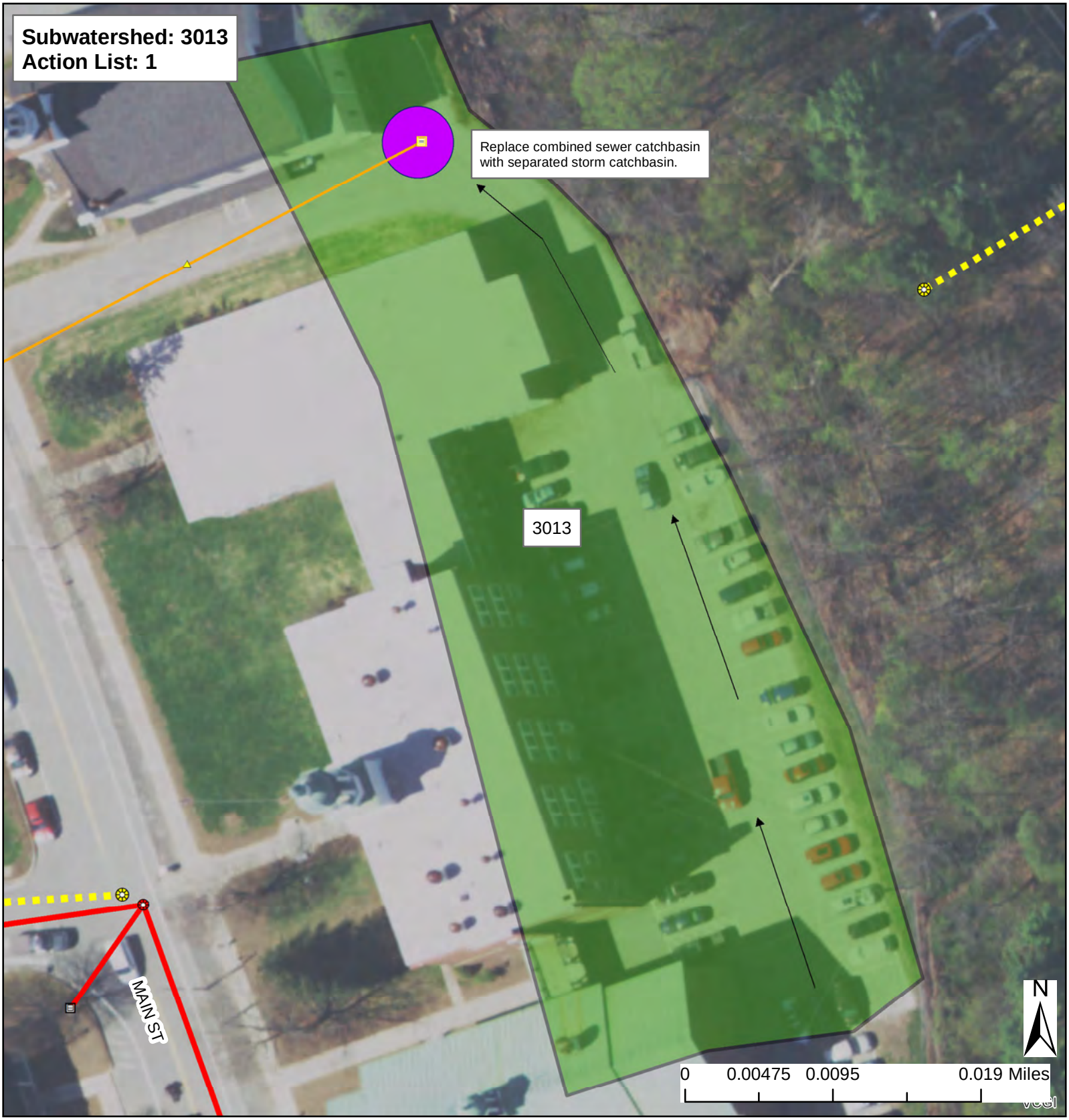

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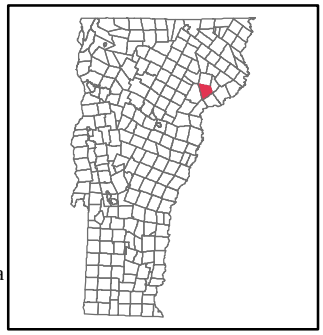

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- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WSMD - Clean Water Initiative Program
Plotted Date: 1/30/2020
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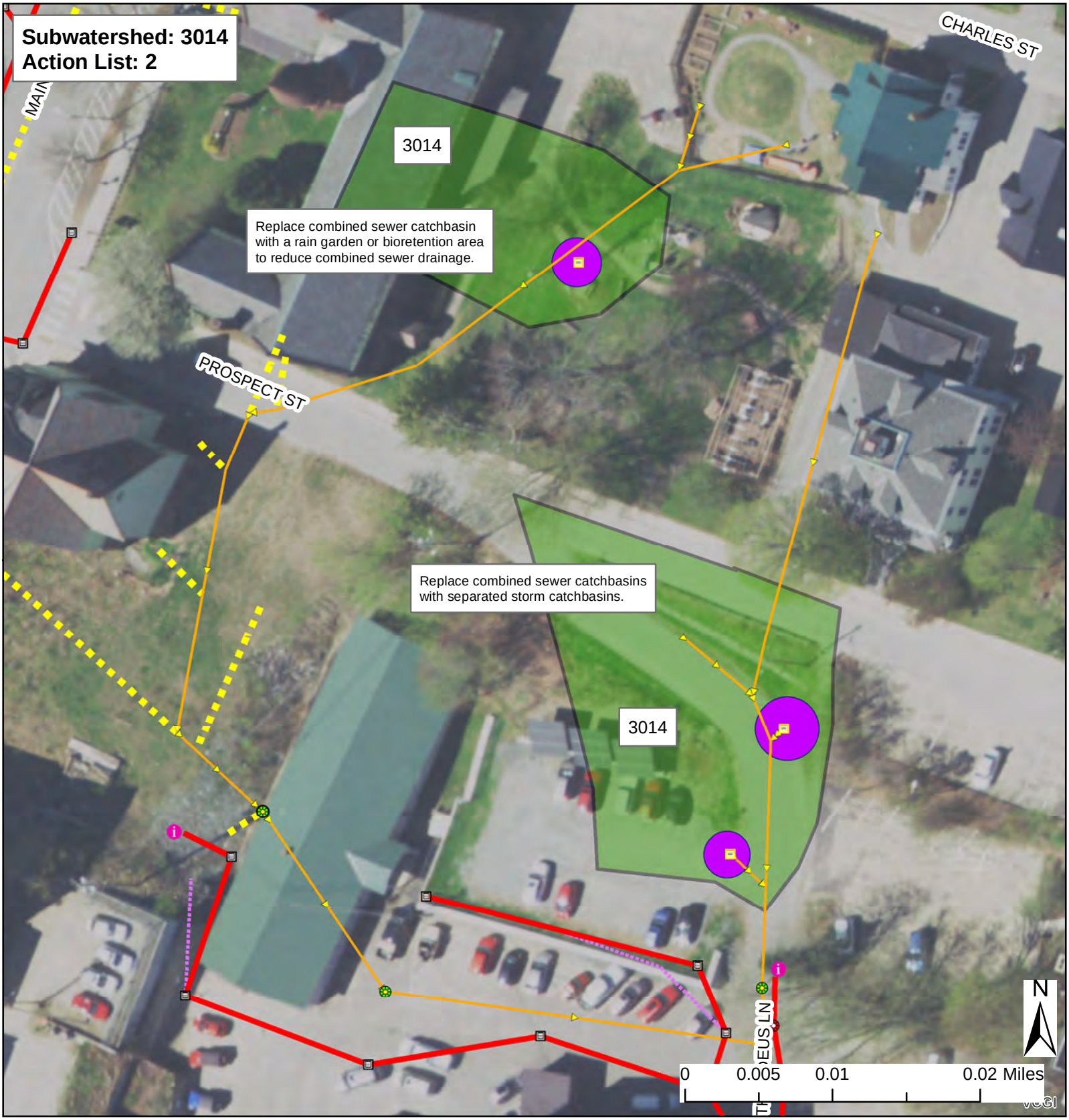

St. Johnsbury, VT

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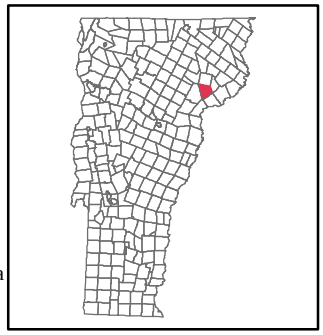

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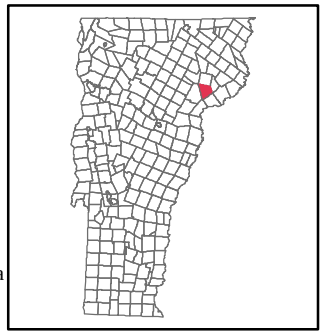

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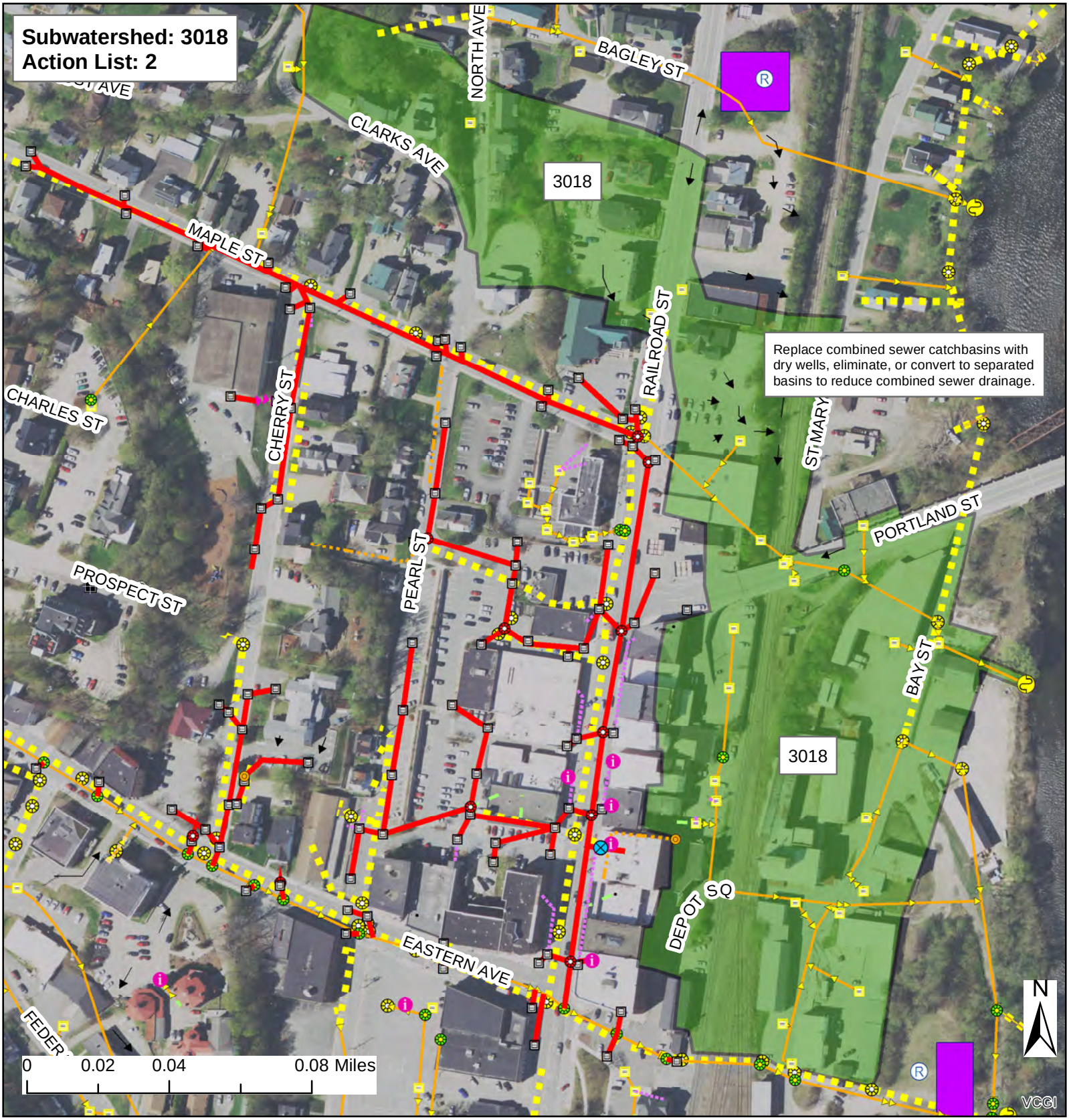

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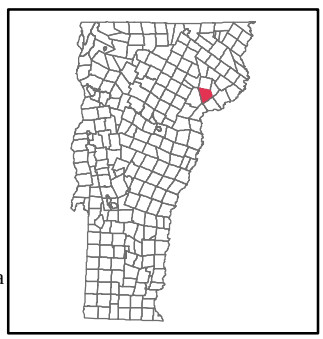

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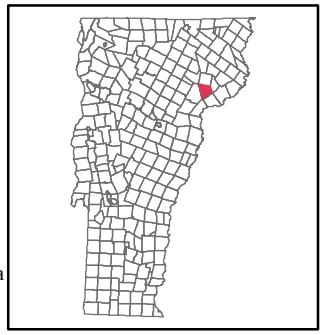

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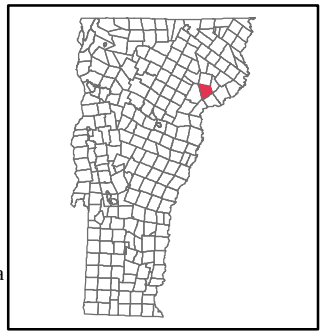

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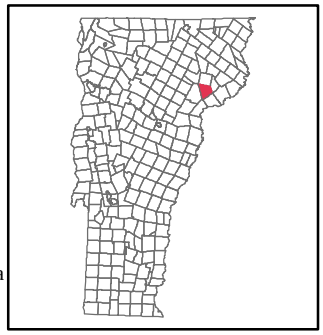

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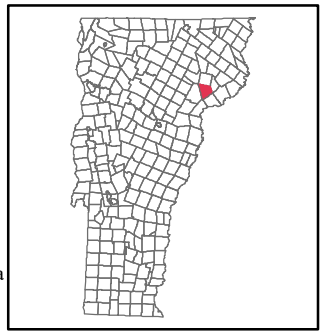

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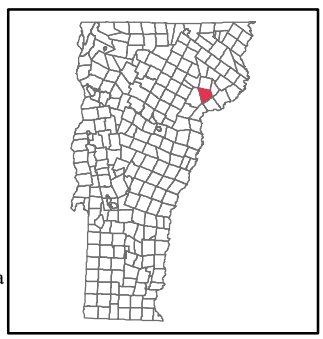

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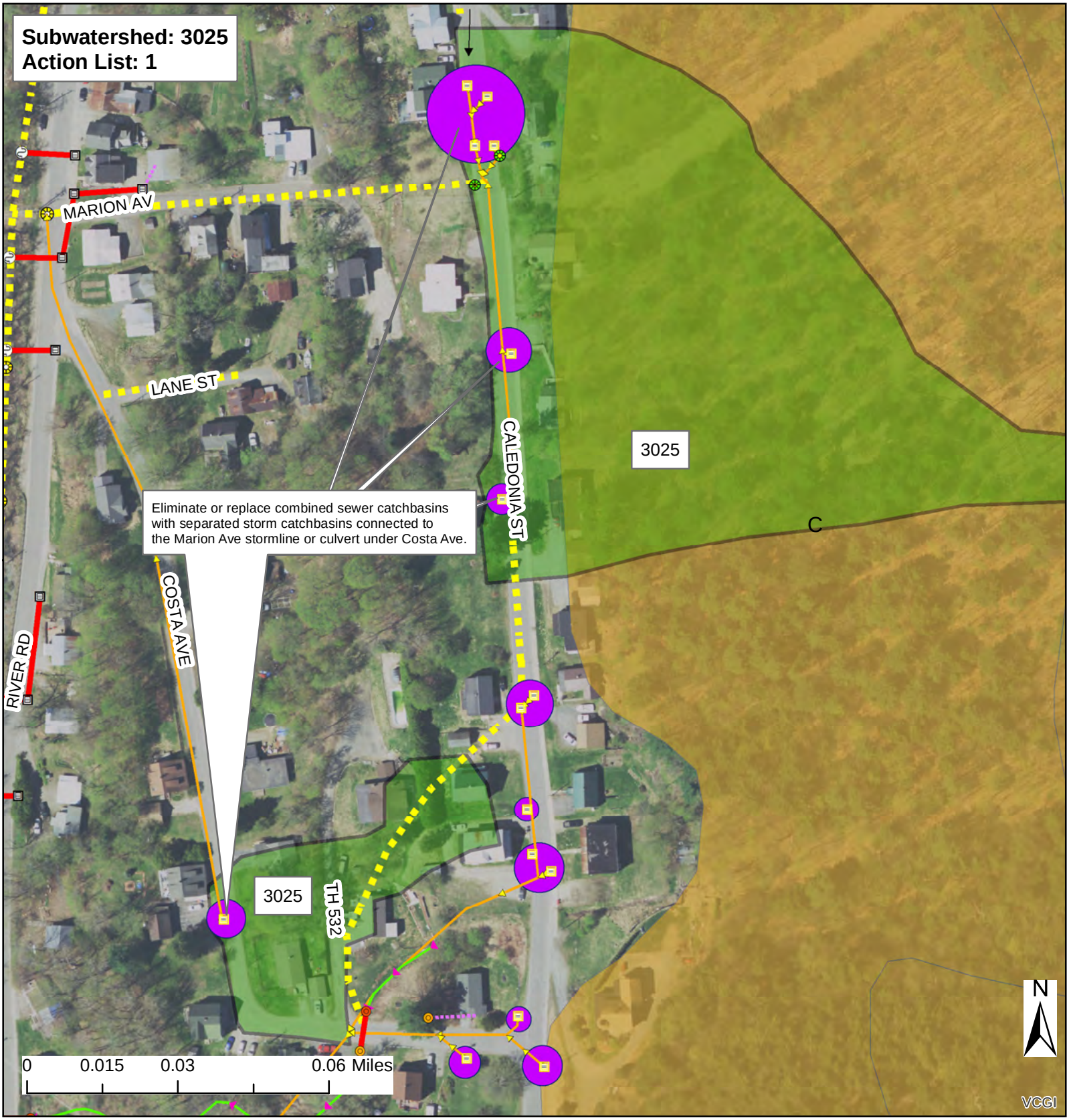

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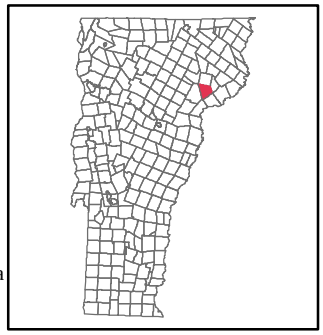

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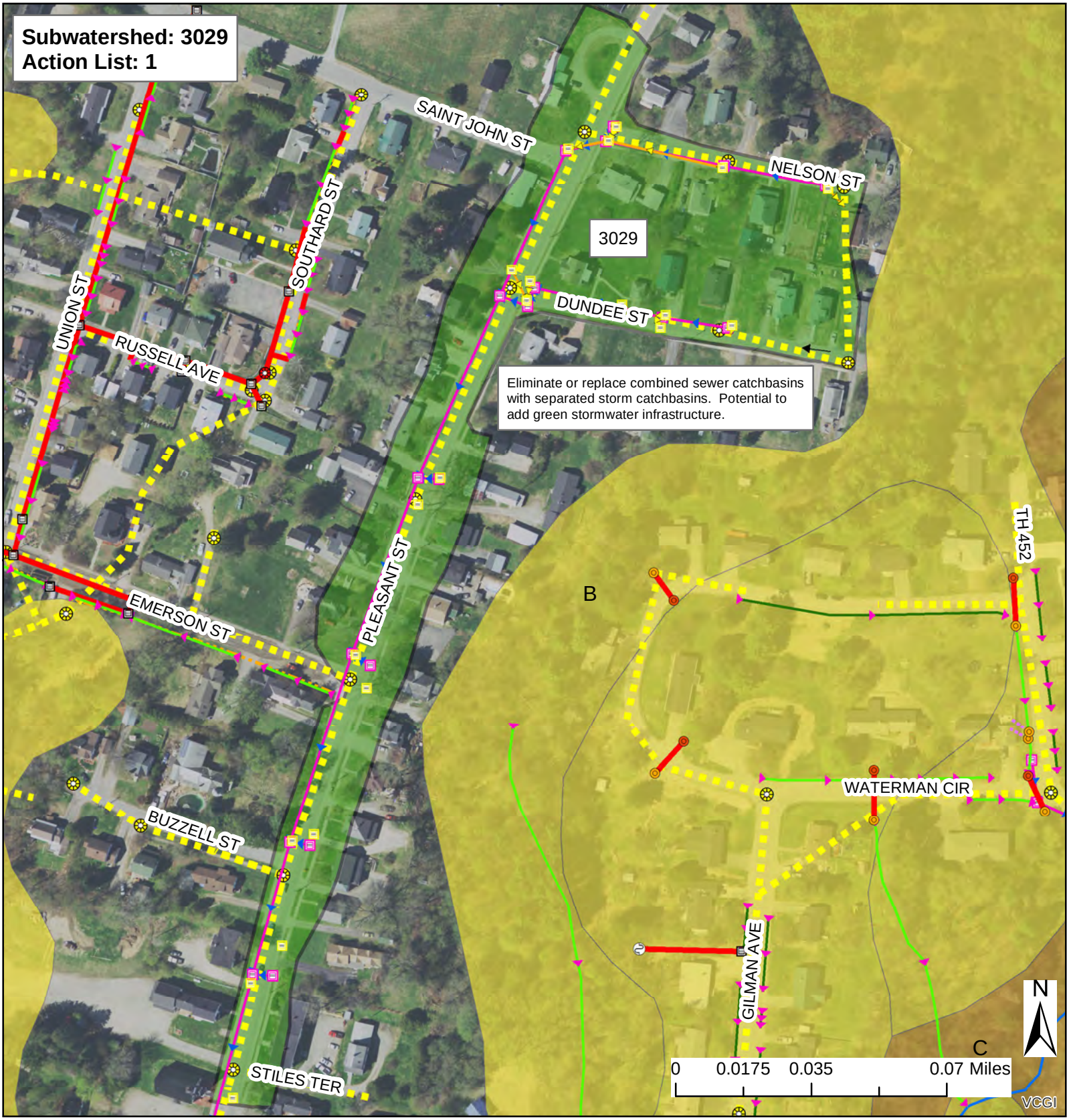

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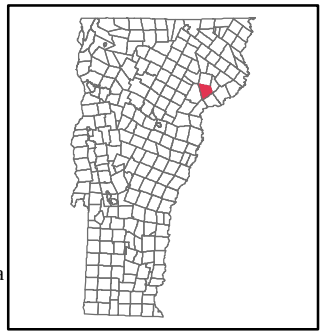

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Subwatershed: 3030
Action List: 1

not rated

3030

Eliminate or replace combined sewer catchbasins with separated storm catchbasins. Potential to add green stormwater infrastructure.

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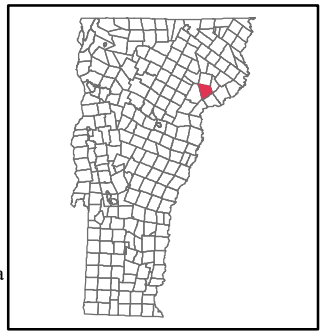

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Spill Control

and

Vermont Hazardous Waste Management Regulations

Have a spill control plan for accidental spills at municipal facilities and on municipal streets

These stormwater infrastructure maps show the connectivity of the stormwater system for the municipality as accurately as it could be determined with the collected and existing data. In the event of a spill this can be a valuable tool for controlling spills and in spill response.

Towns should be equipped with suitable equipment to contain and clean up spills of hazardous materials. Accidental spills of materials can be sources of runoff pollution if not addressed appropriately. If possible Towns should be prepared to address spills on municipal streets while at the same time contacting the state Waste Management Division. DPW managers should be aware of all applicable requirements and should contact regulatory authorities if requirements are not known.

All spills should be cleaned up immediately after they occur. For municipal facilities the creation of a site specific spill control and response plan in combination with spill response training for designated on-site personnel can be effective in dealing with accidental spills and preventing the contamination of soil, water, and runoff. Preparation of a spill containment, control, and countermeasures (SPCC) plan might be required to meet regulatory requirements (e.g., requirements regarding storage of specified chemicals above certain volume thresholds).

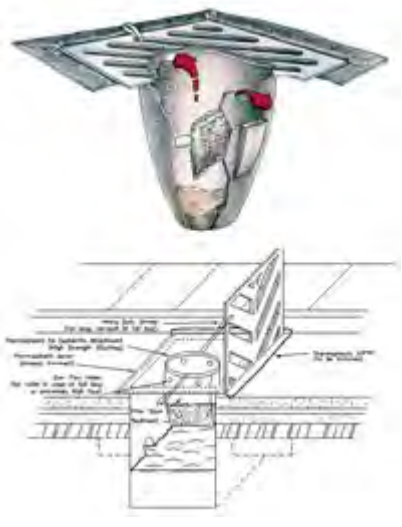
Even if a formal plan is not required, preparing one is a good idea. In general, an SPCC plan should include guidance to site personnel on the following:

— Proper notification when a spill occurs;
— Site responsibility with respect to addressing the cleanup of a spill;
— Stopping the source of a spill;
— Cleaning up a spill;
— Proper disposal of materials contaminated by the spill;
— Location of spill response equipment programs; and
— Training for designated on-site personnel.

A periodic spill “fire drill” should be conducted to help prepare Town personnel in the event of a spill.

Spill Prevention and Response Measures

Catch Basin Inserts



Catch Basin Inserts (Drain Guards / Sediment Traps) protect our rivers and streams by capturing sediment, debris, oil and grease at storm water catch basins. Catch Basin Inserts are an economical and effective method to protect you from costly clean-up work.

The standard filter material is a non-woven geotextile with built-in overflow ports for cases of abnormally high water flow or over-filled filter bags. Catch Basin Inserts are available with a replaceable 5” x 15” oil absorbent boom that floats to absorb any oil, gas or diesel entering a storm water catch basin.

Urethane Drain Protector

Urethane Drain Protectors are positive sealing drain covers that ensure spills do not enter drains. Drain Protectors are environmentally safe and resistant to chemicals, solvents and hydrocarbons. After use, the Drain Protector can be washed and stored in its tube storage container.

Absorbent Socks

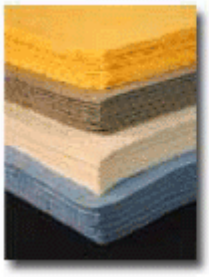
Absorbent socks are flexible tubes used to contain and clean-up spilled fluids. Socks are widely used in industrial applications and are ideal for Spill Kits. Fast spreading spills are quickly stopped with a sock.

Drums & Intermediate Bulk Containers (IBC's)

New and reconditioned steel drums are ideal for storing solid and liquid waste. Poly drums available for durable outdoor storage or for building your own spill kits. Steel and poly drums are available in both tight-head (TH) and full open-head styles (FOH).

Pads & Rolls

Absorbent pads and rolls made from polypropylene fibers are the most popular form of absorbents on the market. Various types of absorbent pads and rolls can be used for different liquids and site applications.



The most widely used absorbent pads and rolls are oil-only (white) and universal (grey). Pads and rolls are great for spills on land, easily absorbing 20 to 25 times their own weight in water or recovered liquid. Rolls can easily be cut to the exact size required.

Booms

Linkable Absorbent Booms

Absorbent booms are ideal for containing and cleaning up spills on water. Booms repel water and float even when completely saturated. Absorbent booms are constructed with a strong mesh outer skin encasing non-linting and highly absorbent polypropylene filler. Linkable booms come complete with end rings and clips attached to nylon rope running the length of the boom.

Collection basins
Collection basins are permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Unlike containment dikes, collection basins can receive and contain materials from many locations across a facility.

Containment diking
Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any industrial facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.

Curbing
Similar to containment diking, a curb is a barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.

Granular Absorbents
A variety of granular and powdered absorbents are available for the effective clean-up of spills on streets, construction sites and in repair shops. These products absorb spilled liquids of various kinds to greatly lower the viscosity, aiding in the clean-up of the spill.

Sorbents, Gels, and Foams
Sorbents are compounds that immobilize materials by surface absorption or adsorption in the sorbent bulk. Gelling agents interact with the spilled chemical(s) by concentrating and congealing to form a rigid or viscous material more conducive to a mechanical cleanup. Foams are mixtures of air and aqueous solutions of proteins and surfactant-based foaming agents. The primary purpose of foams is to reduce the vapor concentration above the spill surface, thereby controlling the rate of evaporation.

§ **7-105** EMERGENCY AND CORRECTIVE ACTIONS
(a) Emergency actions
(1) In the event of a discharge of hazardous waste or a release of a hazardous material, the person in control of such waste or material shall:
(A) Take all appropriate immediate actions to protect human health and the environment including, but not limited to, emergency containment measures and notification as described below; and
(B) Take any further clean up actions as may be required and approved by federal, state, or local officials, or corrective actions as specified under **subsection (b)** of this section so that the discharged waste or released material and related contaminated materials no longer present a hazard to human health or the environment.
(2) Reporting
(A) All discharges and/or releases that meet any of the following criteria shall be immediately reported to the Secretary by the person or persons exercising control over such waste by calling the Waste Management Division at **(802) 241-3888**, Monday

through Friday, 7:45 a.m. to 4:30 p.m. or the Department of Public Safety, Emergency Management Division at **(800) 641-5005**, 24 hours/day:

(i) A discharge of hazardous waste, or release of hazardous material that exceeds 2 gallons;

(ii) A discharge of hazardous waste, or release of hazardous material that is less than or equal to 2 gallons and poses a potential or actual threat to human health or the environment; or

(iii) A discharge of hazardous waste, or release of hazardous material that equals or exceeds its corresponding reportable quantity under CERCLA as specified under **40 CFR § 302.4.**

Note: Under the Federal Water Pollution Control Act, certain spills of "oil" and/or "hazardous substances" are prohibited and must be reported pursuant to the requirements of **40 CFR Part 110** / Discharge of Oil. Certain spills of hazardous substances must also be reported pursuant to CERCLA. In both cases, the National Response Center must be notified at **(800) 424-8802**. Finally, in addition to federal and state spill reporting, EPCRA requires that spills are also reported to local authorities.

(B) A written report shall be submitted to the Secretary within ten (10) days following any discharge or release subject to **subsection (a)(1)** of this section. The report should be sent to: The Vermont Department of Environmental Conservation, Waste Management Division, 103 South Main Street, Waterbury, VT 05671-0404. The person responsible for submitting the written report may request that it not be submitted for small discharges and/or releases that were reported pursuant to subsection (a)(2)(A) of this section, and that have been entirely remediated within the ten (10) day period immediately following the discharge and/or release

(3) If the discharge or release occurred during transportation, the transporter shall, in addition to notifying the Secretary:

(A) Notify the National Response Center at (800) 424-8802 or (202) 426-2675, if required by **49 CFR § 171.15**; and

(B) Report in writing to the Director, Office of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590, if required by **49 CFR § 171.16**; and

(C) A water (bulk shipment) transporter who has discharged hazardous wastes must give the same notice as required by **33 CFR § 153.203** for oil and hazardous substances.

(4) If a discharge or release occurs and the Secretary determines that immediate removal of the waste is necessary to protect human health or the environment, the Secretary may authorize its removal by unpermitted transporters without the preparation of a manifest. Such hazardous waste may be transported to a site authorized by the Secretary under the provisions of **§ 7-503** to temporarily accept hazardous waste generated during an emergency cleanup of a discharge or release.

(5) In the case of an explosives or munitions emergency response, if a Federal, State, Tribal or local official acting within the scope of his or her official responsibilities, or an explosives or munitions emergency response specialist, determines that immediate removal of the material or waste is necessary to protect human health or the environment, that official or specialist may authorize the removal of the material or waste by transporters who do not have EPA identification numbers or hold Vermont hazardous waste transportation permits and without the preparation of a manifest. In the case of emergencies involving military munitions, the responding military emergency response specialist's organizational unit must retain records for three years identifying the dates of the response,

the responsible persons responding, the type and description of material addressed, and its disposition.

(6) All clean up debris and residues that are hazardous waste must be transported ultimately to either:

(A) A designated facility;

(B) A person authorized by the Secretary to use such waste if the waste has been delisted pursuant to **§ 7-218**;

(C) Some other location specified and authorized by the Secretary to receive clean up debris and residues if the waste has been delisted pursuant to **§ 7-218**; or

(D) For hazardous waste not defined as hazardous in 40 CFR Part 261 (i.e., waste regulated as hazardous by Vermont), to a facility, that is not a designated facility, located in a state other than Vermont provided the facility can receive such waste under applicable state and local laws, regulations and ordinances.

(b) Corrective actions

(1) If a discharge of hazardous waste, or a release of hazardous material has not been adequately addressed under **subsection (a)(1)(A)** of this section the Secretary may require that the person or persons responsible pursuant to **10 V.S.A. § 6615** complete the following:

(A) Engage the services of an environmental consultant experienced in the investigation and remediation of hazardous waste-contaminated sites; and

(B) Within thirty (30) days from either the date of the discharge/release or the date that the release was discovered if the date of discharge/release is not known, or within a period of time established by an alternative schedule approved by the Secretary, submit for approval by the Secretary a work plan for an investigation of the contaminated site (i.e., site investigation) prepared by the environmental consultant. The site investigation shall define the nature, degree and extent of the contamination; and shall assess potential impacts to human health and the environment (refer to the document titled: "Site Investigation Procedure" which is available from the Secretary upon request); and

(C) Perform the site investigation within either ninety (90) days of receiving written approval of the work plan by the Secretary, or a period of time established by an alternative schedule approved by the Secretary. A report detailing the findings of the site investigation shall be sent to the Secretary for review; and

(D) Within either thirty (30) days from the date of final acceptance of the site investigation report by the Secretary, or a period of time established by an alternative schedule approved by the Secretary, submit a corrective action plan prepared by the environmental consultant (refer to the document titled: "Corrective Action Guidance" which is available from the Secretary upon request); and

(E) Implement the corrective action plan within either ninety (90) days of receiving written approval of the plan by the Secretary, or a period of time established by an alternative schedule approved by the Secretary. The corrective action activity shall continue until the contamination is remediated to levels approved by the Secretary; and

(F) Submit to the Secretary all investigative, corrective action and monitoring reports, and all analytical results related to subsections (b)(1)(C) through (E) of this section, as they become available.

(2) A used or fired military munition is a waste and is potentially subject to corrective action authorities pursuant to 10 V.S.A. § 6615, and the process described by subsection (b)(1) of this section if the munition lands off-range and is not promptly rendered safe or retrieved. Any imminent and substantial threats associated with any remaining material must be addressed. If remedial action is infeasible, the operator of the range must maintain a record of the event for as long as any threat remains. The record must include the type of munition and its location (to the extent the location is known).

§ 7-106 LAND DISPOSAL RESTRICTIONS

(a) Certain hazardous wastes shall not be disposed of in or on the land. **40 CFR Part 268**, which is hereby incorporated by reference, except for 40 CFR §§ 268.5, 268.6, and 268.42(b), identifies those wastes which shall not be land disposed and describes the limited circumstances under which an otherwise prohibited waste may continue to be land disposed. The authority for implementing the CFR sections not incorporated by reference remains with the EPA.

Note: A copy of 40 CFR Part 268 (the Land Disposal Restrictions rule), as incorporated by these regulations, is available from the Secretary upon request.

(b) In addition to the prohibitions of **40 CFR Part 268**, the Secretary may restrict the land disposal of any hazardous waste in the State of Vermont:

(1) Which may present an undue risk to human health or the environment, immediately or over a period of time; or

(2) Which would be incompatible with the **groundwater protection rule and strategy** of chapter 12 of the environmental protection rules.

(c) Dilution of hazardous waste subject to the land disposal restrictions of **40 CFR Part 268** is prohibited pursuant to **40 CFR § 268.3.**

§ 7-107 ENFORCEMENT

(a) Information that the generation, transportation, treatment, storage or disposal of hazardous waste may present an actual or potential threat to human health or the environment, or is a violation of the 10 V.S.A. chapter 159, or these regulations, or any term or condition of certification, order, or assurance, may serve as grounds for an enforcement action by the Secretary, including, but not limited to:

(1) After notice and opportunity for hearing, issuing an order directing any person to take such steps as are necessary to:

(A) Immediately cease and desist any operation or practice;

(B) Correct or prevent environmental damage likely to result from any deficiency in operation or practice;

(C) Suspend or revoke any certification and require temporary or permanent cessation of the operation of such facility;

(2) A request that the Attorney General or appropriate State's Attorney commence an action for injunctive relief, the imposition of penalties and fines provided in **10 V.S.A. § 6612** and other relief as may be appropriate.

(3) An order for reimbursement to any agency of federal, state, or local government from any person whose act caused governmental expenditures under **10 V.S.A § 1283**.

(4) All other powers of enforcement available to the Secretary through **10 V.S.A., chapter 201**.

(b) The hearing by the Secretary identified under **subsection (a)(1)** of this section shall be conducted as a contested case. Pursuant to **10 V.S.A. § 6610(b)**, the Secretary may issue an emergency order without a prior hearing when an ongoing violation presents an immediate threat of substantial harm to the environment or an immediate threat to public health. An emergency order shall be effective upon actual notice to the person against whom the order is issued. Any person to whom an emergency order is issued shall be given the opportunity for a hearing within five (5) business days of the date the order is issued.

(c) Inspections, investigations, and property access **(10 V.S.A. § 8005)**

(1) Inspections and investigations

(A) An investigator may perform routine inspections to determine compliance.

(B) An investigator may investigate upon receipt or discovery of information that an activity is being or has been conducted that may constitute or cause a violation.

(C) An investigator, upon presentation of credentials, may seek permission to inspect or investigate any portion of the property, fixtures, or other appurtenances belonging to or used by a person whose activity is required to be in compliance. The investigator shall state the purpose of the inspection or investigation. An inspection or investigation may include monitoring, sampling, testing, and copying of any records, reports, or other documents relating to the purposes to be served by compliance.

(D) If permission for an inspection or investigation is refused, the investigator may seek an access order from the district or superior court in whose jurisdiction the property is located enabling the investigator to perform the inspection or investigation.

(2) Access orders

(A) If access has been refused, an access order may be sought pursuant to either **10 V.S.A. § 80**05 or **10 V.S.A. § 6609**.

(B) Issuance of an access order shall not negate the Secretary's authority to initiate criminal proceedings in the same matter by referring the matter to the office of the attorney general or a state's attorney.

(d) In an action to enforce these regulations, anyone raising a claim that a certain material is not a hazardous waste, or is exempt from regulation as hazardous waste, must demonstrate that there is a known market or disposition for the material, and that they meet the terms of the exclusion or exemption. Appropriate documentation (such as contracts showing that a second person uses the material as an ingredient in a production process) to demonstrate that the material is not a waste, or is exempt from regulation, must be provided. Owners and operators of facilities claiming that they are actually recycling materials must show that they have the necessary equipment to do so.