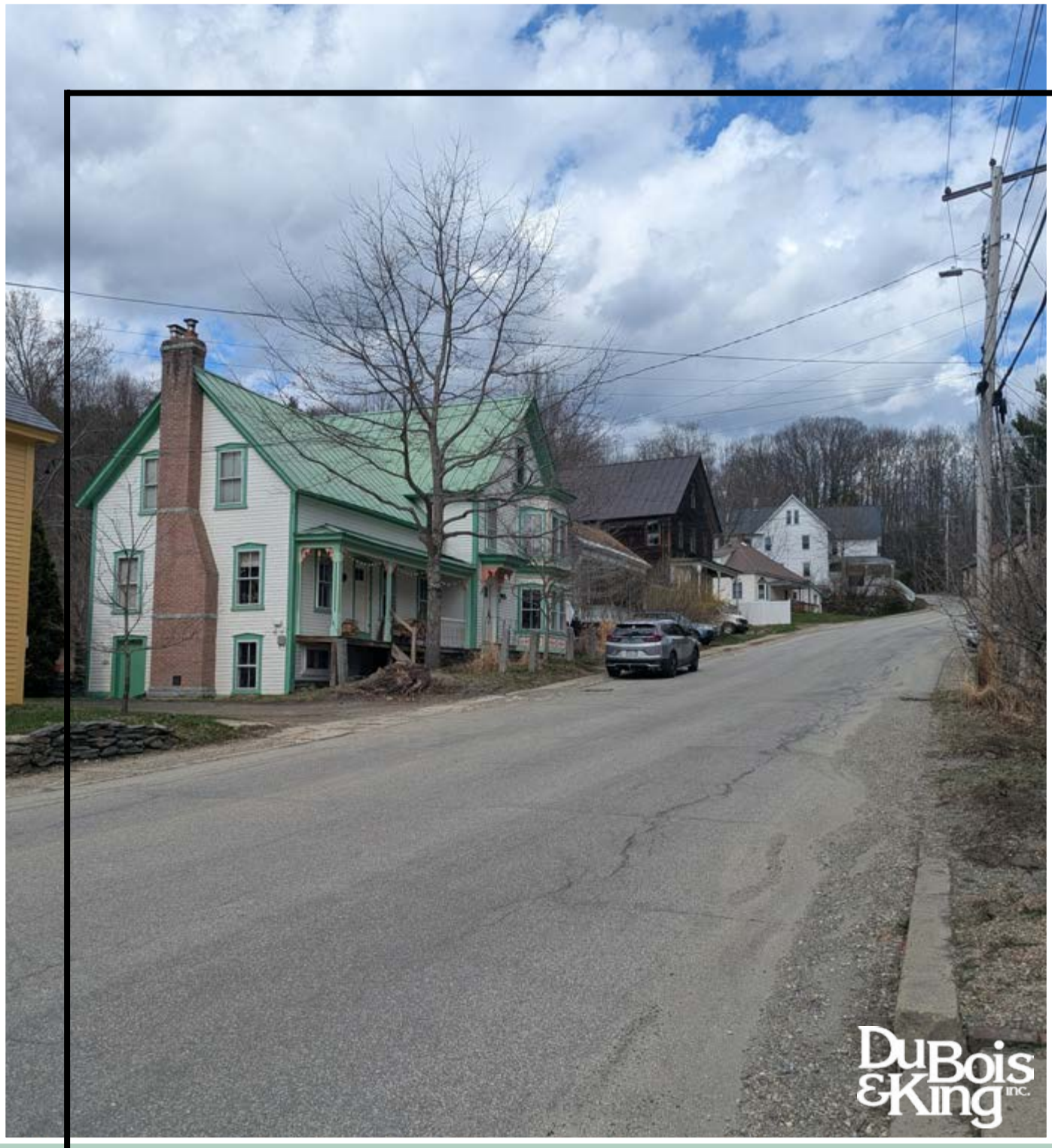
GATES POND ROAD STORMWATER SCOPING STUDY

OCTOBER 2026



PREPARED FOR THE TOWN OF WHITINGHAM, VT

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01. INTRODUCTION

Image 1.0 Home along Gates Pond Road

The Windham Regional Commission (WRC), in partnership with the Town of Whitingham, VT, initiated this Stormwater Scoping Study and Conceptual Design project to evaluate drainage conditions and identify potential stormwater management improvements along Gates Pond Road in the Village of Jacksonville. The Project Area extends between the intersections of Vermont Route 100 (VT-100) and Reed Hill Road and focuses on reducing untreated stormwater runoff, improving flood resiliency, and protecting private and public property and downstream water resources. The study supports ongoing regional and municipal efforts to address water quality concerns and strengthen community resilience in the face of increasingly frequent and severe storm events.



Image 1.1 Project Location, Whitingham, VT.

Existing drainage infrastructure along Gates Pond Road currently conveys stormwater runoff directly into a tributary of the East Branch of the North River without any treatment. Runoff generated from impervious surfaces including the roadway, driveways, and adjacent residential properties contributes sediment, nutrients, and other pollutants into the receiving waters. During large rain events, concentrated runoff also contributes to localized flooding, and inundation of nearby residential properties and downstream areas within the Village of Jacksonville.

This project was developed in response to these ongoing drainage and flooding concerns and is intended to identify practical, implementable stormwater management strategies that improve both water quality and hydraulic function within the study area. The conceptual design emphasizes the use of Best Management Practices (BMPs), including green stormwater infrastructure approaches where feasible,

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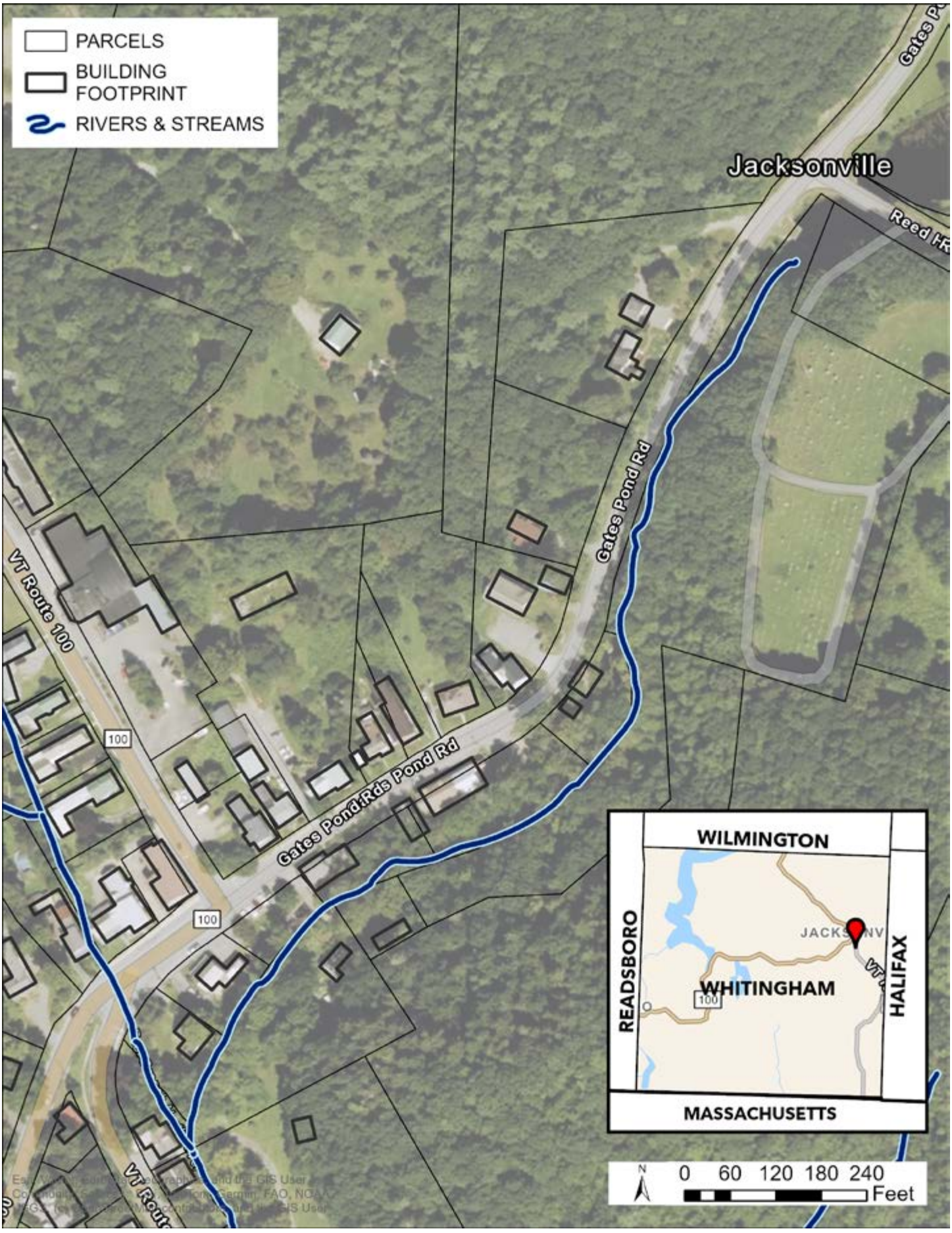


Image 1.2 The Project Area in the Village of Jacksonville.

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Image 1.3 Public park in Project Area.



Image 1.4 Catch basin within Project Area.



Image 1.5 Swale and catch basin along Gates Pond Road.

to slow, infiltrate, convey, and treat runoff before it enters receiving waters. The study also considers the relationships among roadway drainage, adjacent properties, existing infrastructure, and downstream flooding conditions to support a comprehensive understanding of watershed dynamics within the Project Area.

PROJECT PROCESS

The scoping process included review of existing site conditions, publicly available mapping and environmental data, field observations, and evaluation of potential opportunities and constraints associated with future stormwater improvements. Considerations included topography, soils, roadway geometry, existing drainage infrastructure, nearby utilities, stream and floodplain conditions, property ownership, environmental constraints, and long-term operations and maintenance needs. Conceptual-level recommendations were developed to support future project advancement, permitting, and implementation planning.

An initial site visit was conducted with representatives from the Town of Whitingham, the Vermont Department of Environmental Conservation (VT DEC), and the Windham Regional Commission (WRC) to review existing drainage infrastructure, observe stormwater flow patterns, and identify known flooding and erosion concerns throughout the Gates Pond Road corridor. The visit provided an opportunity for the Project Team to assess existing conditions firsthand, discuss previous storm events and documented problem areas, and better understand the relationships among roadway drainage, adjacent properties, and downstream flooding impacts.

Following the site visit, a public engagement meeting was held to gather input from residents and property owners familiar with recurring drainage and flooding issues within the study area. During the meeting, the Project Team presented the issues already identified through preliminary analysis and field observations and invited community members to share additional concerns, observations, and locations of recurring

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problems not previously documented. Immediately following the meeting, Project Team members and residents participated in a walking tour of the Project Area to observe several of the identified problem areas in person, allowing for valuable discussion regarding site-specific conditions, drainage behavior during storm events, and potential opportunities for future stormwater improvements.



Image 1.6 East Branch of the North River.

SITE CONSTRAINTS SUMMARY

Gates Pond Road and its surrounding drainage area present a set of interconnected site constraints shaped by topography, aging infrastructure, and close proximity between roadway, residential, and stream systems. Runoff from higher elevations is conveyed through a patchwork of surface flow, swales, culverts, and private properties before reaching the East Branch, with several conveyance features appearing undersized, poorly positioned, or obstructed by debris and ice during peak snowmelt. The lack of curbing along portions of the road allows runoff to leave the travel lanes and enter adjacent private parcels, contributing to reported basement flooding, parking area deterioration, and recurring icing hazards at low points including the intersection with VT-100. A bowing and sagging retaining wall at the town-owned riverside park, likely the result of an undersized structure combined with stream dynamics and adjacent catch basin discharge, represents a structural constraint requiring further investigation and replacement. Additional maintenance burdens include seasonal sand and aggregate accumulation on the sidewalk from winter roadway sanding, which limits accessibility for pedestrians and those using mobility devices, such as wheelchairs. Across the Project Area, the majority of stormwater discharges directly into the East Branch without pretreatment, compounding concerns about erosion, sediment transport, and property impacts that are expected to intensify as precipitation patterns shift under changing climate conditions. For a more detailed description of the site constraints, see Chapter 2—Existing Conditions and Chapter 3—Site Analysis.



Image 1.7 Catch basin along Gates Pond Rd

PROPOSED SOLUTIONS

The proposed solutions for the Project Area favor interventions that address multiple stormwater issues at once. At the town park, full replacement of the failing retaining wall is recommended. At the VT-100/ Gates Pond Road intersection, lowering the catch basin would improve capture, pending ownership confirmation. Upstream, converting the undersized swale at 45 Gates Pond Road into a bioretention area and resizing the culvert beneath the barn could reduce flow reaching 3033 VT-100 and VT-100 itself, using currently vegetated, undeveloped land well suited to green

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Image 1.8 Icing over at the catch basin at the intersection of Gates Pond Road and VT-100.

infrastructure. A similar bioswale or bioretention area behind 3033 VT-100, along with an overflow control structure, would further reduce flow and improve water quality while easing potential hazards near the 1 Gates Pond Road parking area and adjacent roadway. Higher up Gates Pond Road, a bioretention area near the Town-owned cemetery is identified as the best option given slope and right-of-way constraints, pending further soil and wall-stability assessment. Finally, new curbed sidewalks and hydrodynamic separators are proposed to replace the existing sidewalks on Gates Pond Road, to better capture and pretreat runoff before it reaches the river.

This project complements broader watershed and resiliency initiatives being advanced by the Town of Whitingham, WRC, the Windham County Natural Resources Conservation District, and the Vermont Department of Environmental Conservation (VT DEC). Collectively, these efforts seek to improve stormwater management, reduce erosion and flooding impacts, enhance aquatic resource protection, and support long-term community resilience throughout the Jacksonville area and surrounding watershed.



Image 1.9 Edge of roadway along Gates Pond Rd.

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02. EXISTING CONDITIONS

Image 2.0 Gates Pond Road looking north.

The Village of Jacksonville is a small rural settlement located within the Town of Whitingham in southeastern Vermont, situated within the Deerfield River watershed. The village is characterized by a narrow valley defined by steep forested hillsides, confined stream corridors, and a transportation network aligned with the natural topography. Gates Pond Road descends toward the Village center, running parallel to the East Branch of the North River. The surrounding topography also slopes towards the intersection of Gates Pond Road and VT-100, creating concentrated stormwater flows during precipitation events. The area's topography, combined with development in the flatter valley-bottom, contributes to rapid runoff conveyance and localized flooding during heavy rainfall and snowmelt events.

Geologically, the area is underlain by metamorphic bedrock typical of southern Vermont, including schist and phyllite formations overlain by glacial till deposits and pockets of alluvial soils near stream corridors. Soil conditions within the village and Project Area vary considerably depending on slope position and proximity to waterways, with upland areas often containing shallow, rocky, and moderately well-drained soils while lower elevations adjacent to streams contain finer alluvial sediments with seasonal groundwater influence (See Images 2.4 and 2.5). These conditions can limit infiltration capacity in some locations while increasing susceptibility to erosion along steep roadside drainage channels and streambanks.







Images 2.1-2.3 (left to right) The bulging retaining wall at the Town Park; development on the narrow strip between the river and the roadway; an eroding parking area on the east side of Gates Pond Road.

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Jacksonville is defined by a largely forested landscape interspersed with low-density residential development, local roadways, and small scale commercial uses concentrated near the village center. There is a stone retaining wall running along the length of the East Branch throughout the Project Area with development on the narrow strip of land between Gates Pond Road and the river (See Images 2.1-2.2).

However, historical development patterns and aging drainage infrastructure have altered natural runoff patterns in several areas. Impervious surfaces associated with roads, driveways, and developed parcels contribute untreated stormwater runoff to nearby streams, while undersized or aging conveyance systems can exacerbate flooding, erosion, and sediment transport during major storm events. Increasing precipitation intensity associated with changing climate conditions has further heightened concerns regarding roadway resilience, stream stability, and downstream flooding vulnerability.

Development within the village is constrained by the surrounding topography and stream network, resulting in close proximity between transportation infrastructure, residential properties, and waterways. As a result, stormwater and flooding issues have direct impacts on homes, private property, roadway safety, and public infrastructure.

Local knowledge and impacts to private property are an important consideration for this study and the community engagement efforts made as a part of this project will be further discussed in the next chapter.

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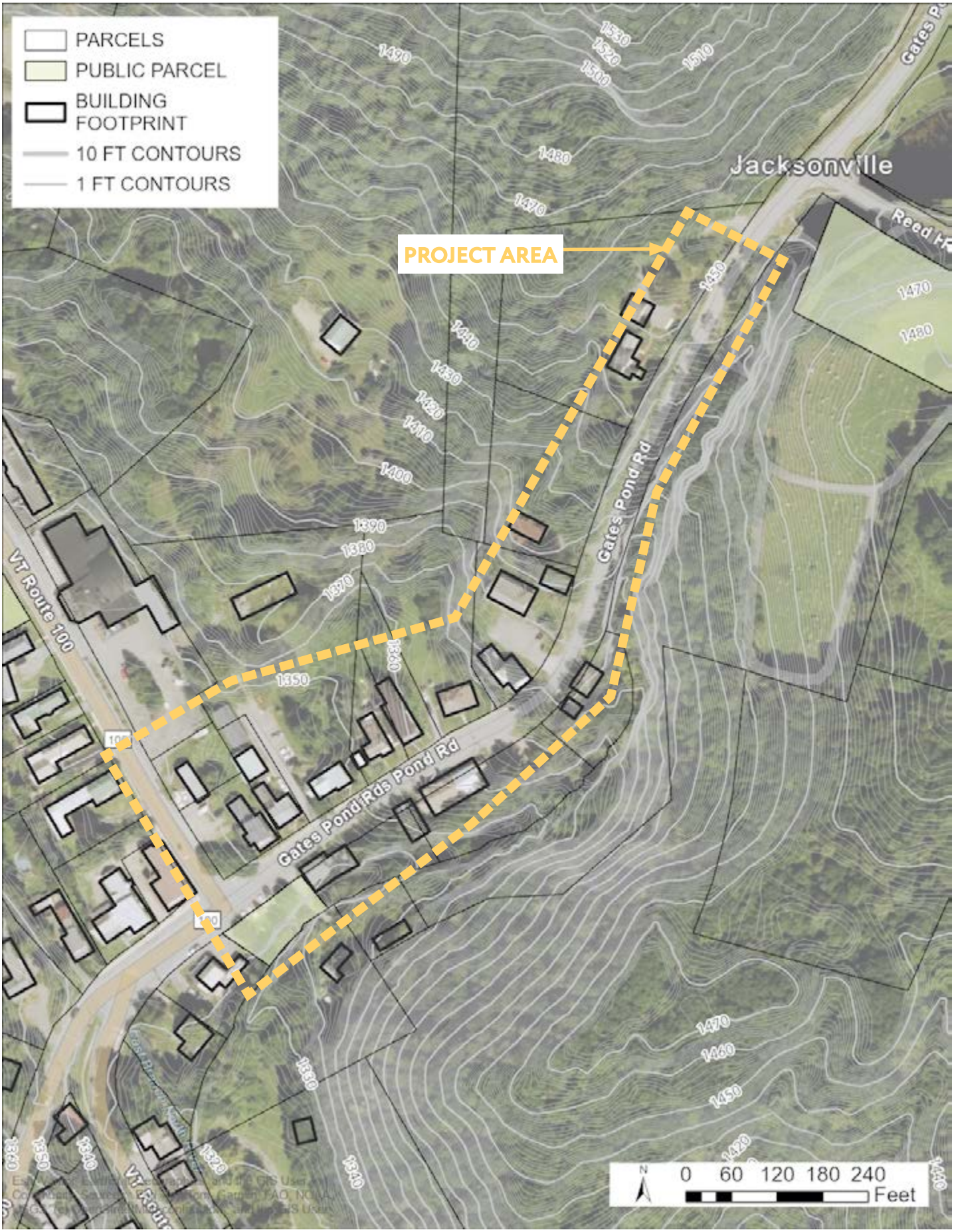


Image 2.4 The Project Area is characterized by steeply sloped topography toward the river and Gates Pond Road with the densest development occurring on flatter, low-lying areas.

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Image 2.5 Shallower bedrock is typical in higher elevation areas to the north of the Project Area.

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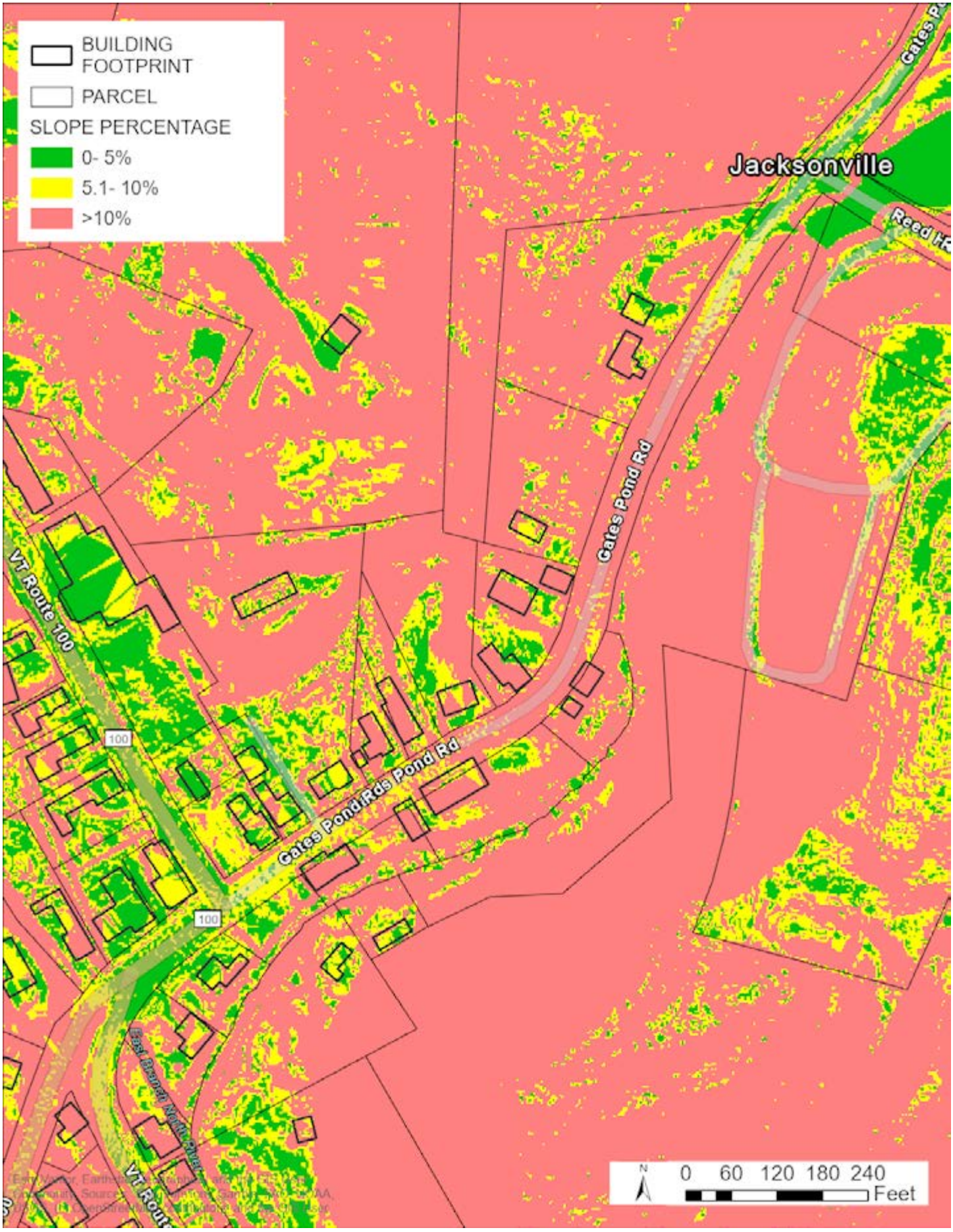


Image 2.6 The majority of the Project Area is characterized by slopes greater than 10% with the lowest slopes occurring near the intersection of Gates Pond Road and VT-100.

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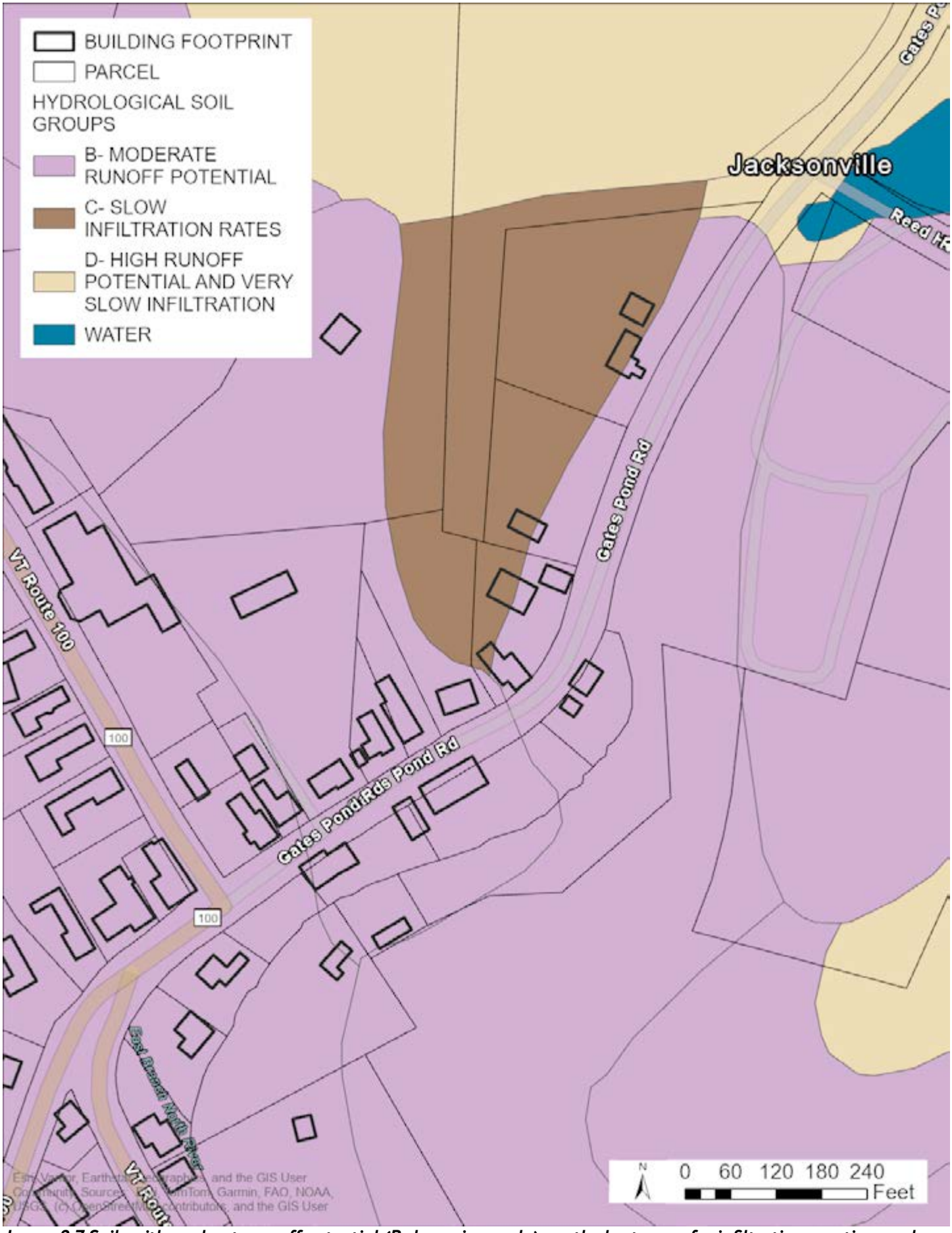


Image 2.7 Soils with moderate runoff potential (B shown in purple) are the best areas for infiltration practices and are in the lower elevation areas south and west in the Project Area.

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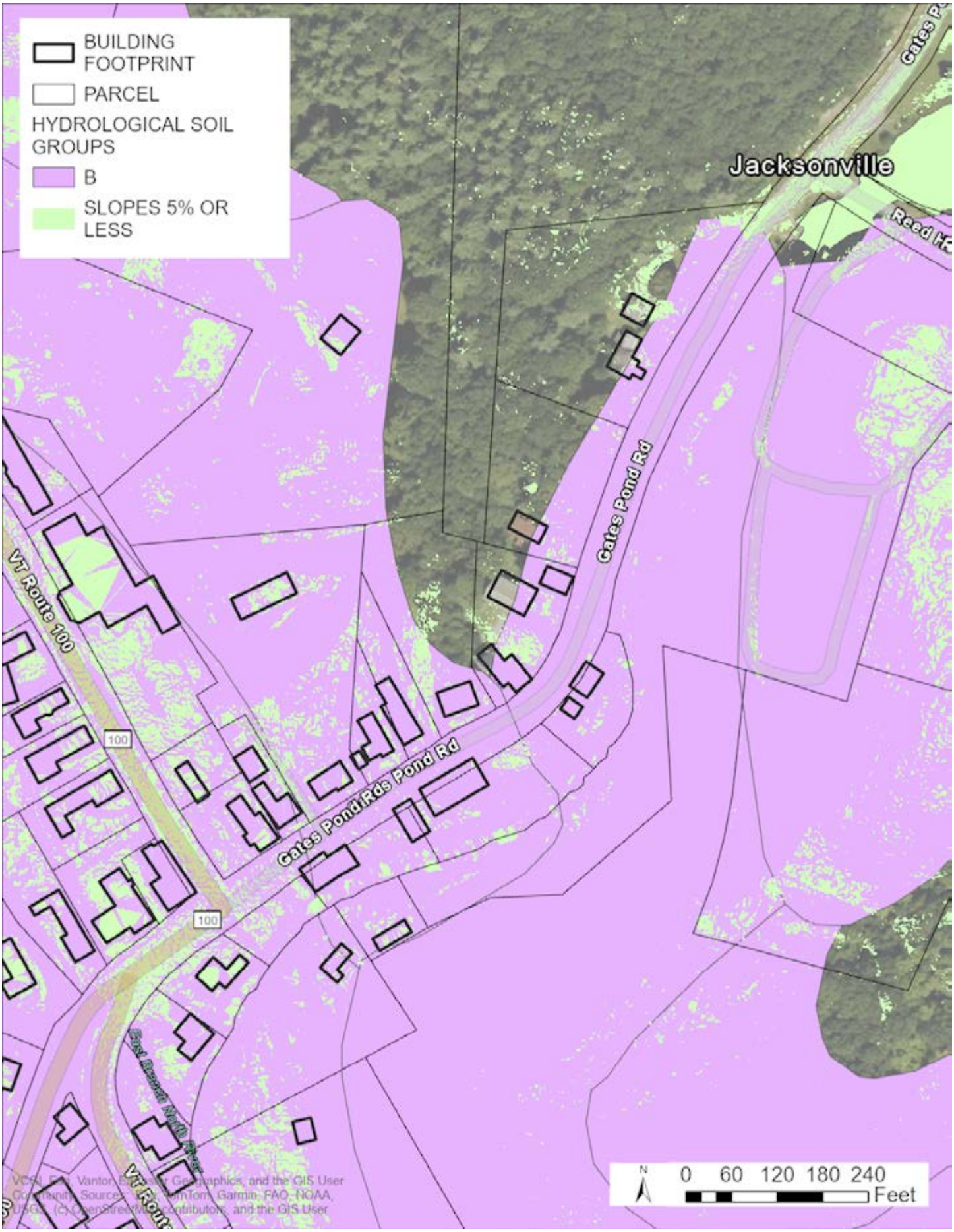


Image 2.8 Overlay of soils with highest infiltration potential and lowest slopes, where these areas overlap (purple and green) indicate the best locations for infiltration and green stormwater infrastructure.

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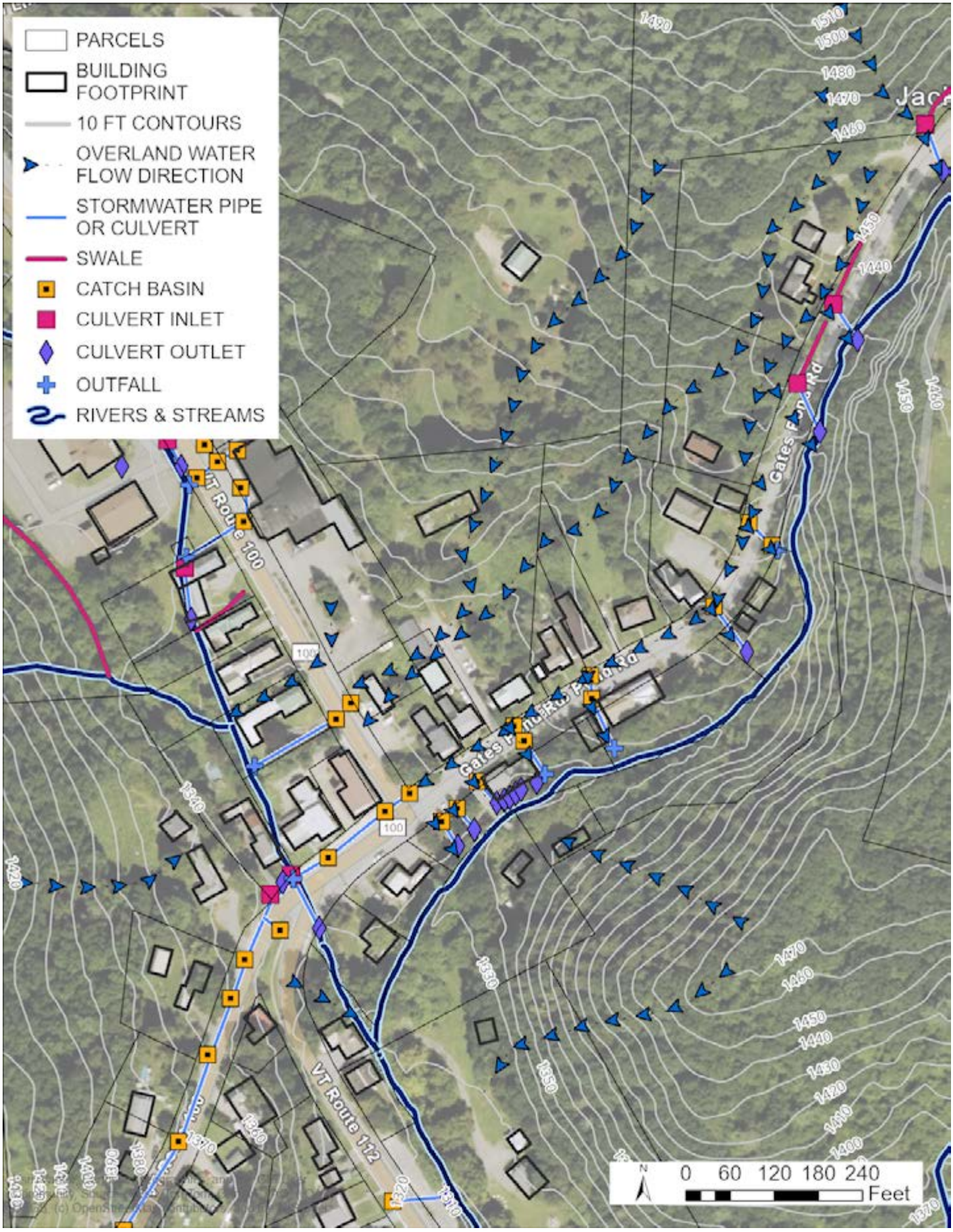


Image 2.9 The stormwater management infrastructure in the Project Area consists of catch basins that empty directly into the East Branch with no pre-treatment (purple diamonds).

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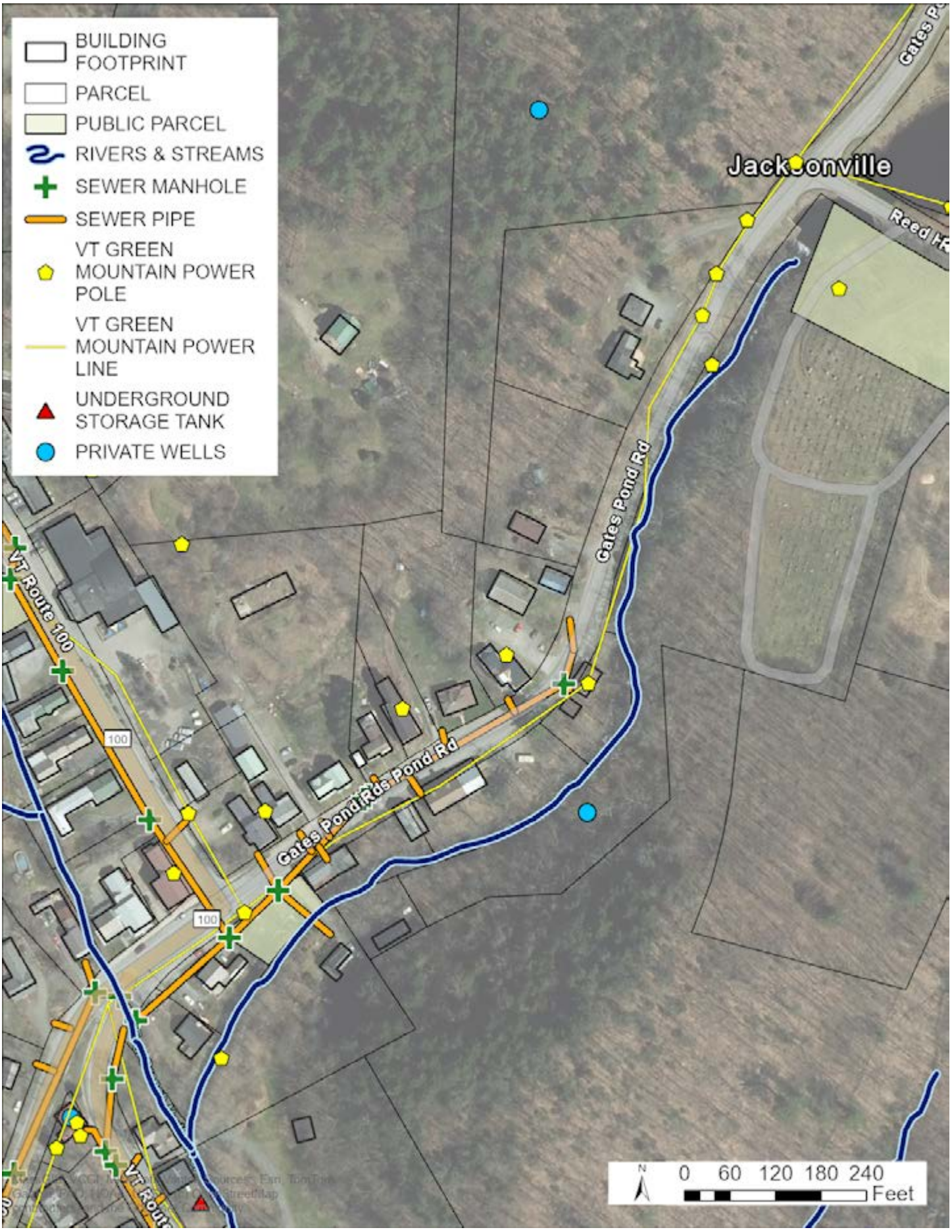


Image 2.10 Additional utility infrastructure within the Project Area.

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Image 3.0 Project Team, Town Staff, and residents inspect an access panel in sidewalk in front of 1 Gates Pond Rd.

03. SITE ANALYSIS

On April 30th, 2026 a public meeting was held to introduce the project to local residents and share with the attendees which issues the Project Team were already aware of based on information provided by the Town and desktop analysis. The meeting was also an opportunity for the Project Team to learn about any other issues residents were having.

The attendees confirmed all of the previously identified issues and had additional details to add. They also informed the Project Team of a few new stormwater concerns that they had observed. Following the meeting, the Project Team, Town Staff, and residents took a walk together to observe the issues discussed and observe on the ground conditions.

Additional follow up conversations took place with residents/property owners regarding their interest in implementing recommendations. The majority of the recommendations would be on Town owned property or in the right of way (ROW). Two key areas that are on private property are described on the following pages in Issues (3) and (4).

Through a desktop analysis, reporting from the Town and residents, and two site visits by the Project Team, a more complete picture has come together of the multiple, interrelated stormwater and drainage issues impacting the Project Area. Gates Pond Road presents several interconnected drainage, conveyance, icing, erosion, and property-impact concerns. The observed conditions indicate that runoff from higher elevations is being conveyed through a combination of surface flow, swales, and culverts. In several locations the existing drainage infrastructure appears to be inadequate or poorly positioned to effectively manage runoff.



Image 3.1 Flyer promoting the public meeting.

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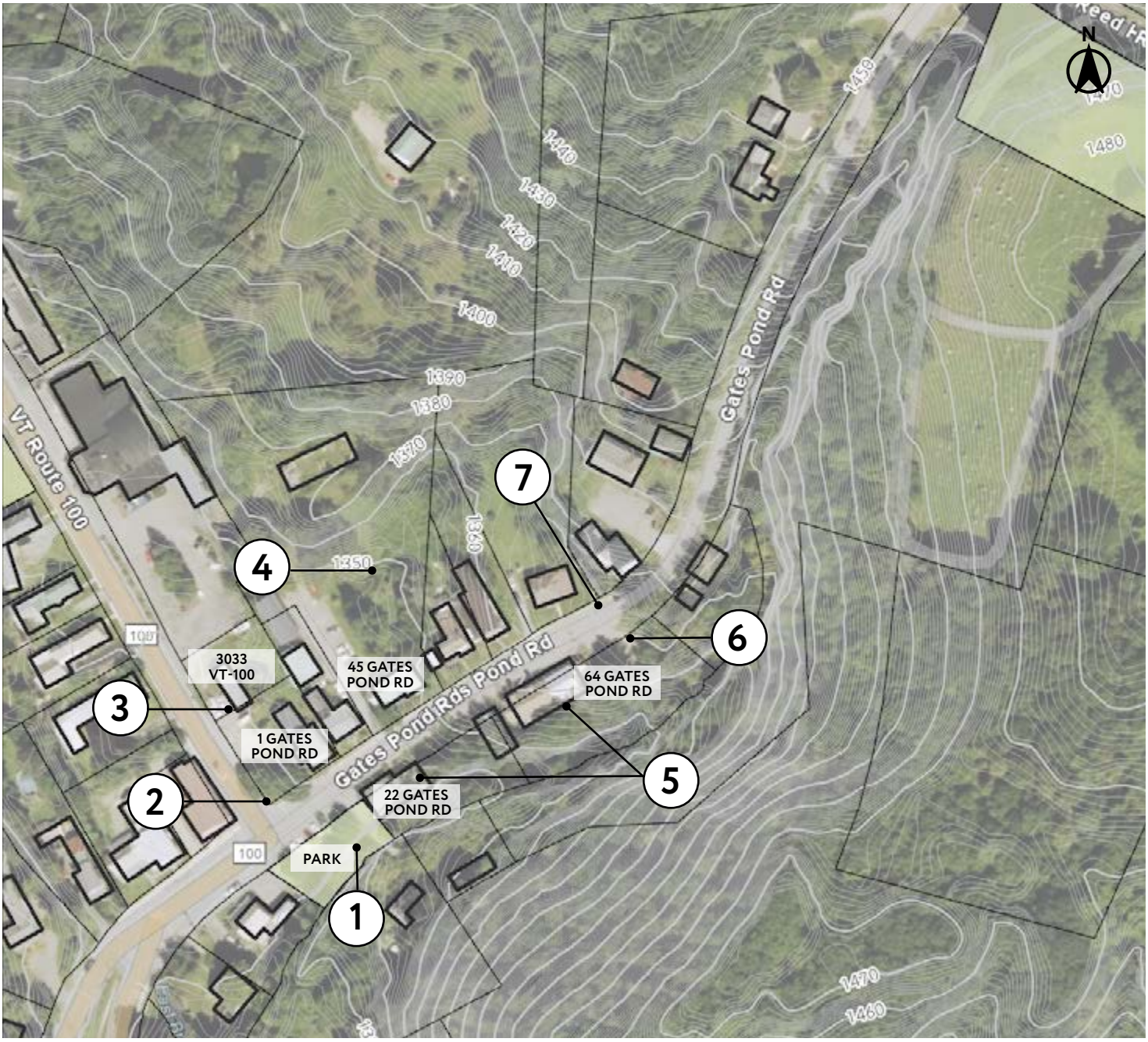


Image 3.2 Project Area key plan indicating areas with stormwater issues, see following pages for photos of each area.

See the key plan in Image 3.2 for the locations of all of the observed and reported issues, summarized as follows:

(1) BULGING WALL AT THE TOWN-OWNED PARK

At the town-owned park along the river, the retaining wall adjacent to the river is bowing on the face and sagging at the top edge of the wall. Two catch basins are located within the park's asphalt parking area. Based on ANR data the drainage pipes from those inlets are discharging directly to the adjacent stream. Through photo and map analysis by DuBois & King's structural engineer, the cause of the structural failure is most likely an undersized wall. Contributing factors could include a combination of stream dynamics and the catch basins and pipes. If the water held in the soil behind the wall fails to equalize with the water in the stream, this could put excessive pressure

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on the wall. A rapid change in water level of the stream and/or water leaking from the drainage structures could cause this disequilibrium. Full replacement of the park section of the wall is recommended, along with further investigation of the existing catch basins and pipes to determine if they are damaged.





Images 3.3-3.4 Retaining wall along river, face is bowing toward the stream, top edge is sagging. Two pipes outlet through the wall and outlet directly into the stream.

2 FAILING CATCH BASIN

At the intersection of Gates Pond Road and VT-100, an existing catch basin appears to be set too high relative to the adjacent roadway elevation. Consequently, stormwater is able to pond in the roadway and surrounding area rather than be captured by the drainage system. During freezing conditions, the ponded water creates a potential ice hazard for both motorists and pedestrians. The drainage condition also adversely affects the parking area serving 1 Gates Pond Road, with motorists needing to drive over ice to access the parking. Field observations indicate that a portion of the runoff contributing to this location originates from behind 3033 VT-100.





Images 3.5-3.6 Catch basin at the intersection of Gates Pond Road and VT-100. Icing on road and into parking area for 1 Gates Pond Rd.

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3 STORMWATER RUNOFF BEHIND 3033 VT-100

Stormwater runoff from higher elevations collects behind the building at 3033 VT-100, as it is the low point for a large drainage area. Runoff is conveyed to this property through a culvert located behind 45 Gates Pond Road. A small swale behind 3033 VT-100 appears to direct runoff around both sides of the building. On the southeast side of the building, the resulting drainage creates wet and muddy conditions during periods of runoff and icy conditions during freezing weather in the parking area for 1 Gates Pond Road. On the northwest side only a limited portion of the runoff appears to reach the existing catch basin along VT-100.







Images 3.7-3.9, starting top left, clock-wise:

Swale behind building at 3033 VT-100; barn belonging to 45 Gates Pond Road can be seen in the distance.

Catch basin on the northwest side of the building at the edge of VT-100.

Southeast side of the building where runoff is directed and creates muddy and icy conditions that affect the parking area of 1 Gates Pond Rd.

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4 STORMWATER RUNOFF BEHIND 45 GATES POND ROAD

Runoff from higher elevations enters a swale located in the rear yard of 45 Gates Pond Road. The swale conveys water into a culvert that extends underground for approximately 65 feet, passing beneath an existing barn before discharging behind 3033 VT-100. The culvert appears to be relatively small in relation to the contributing drainage area and has reportedly become obstructed by debris and ice during spring snowmelt. When the culvert is obstructed or its capacity is exceeded, the area can become flooded. After runoff outlets from the culvert under the barn, it then follows the route behind 3033 VT-100 outlined above in Issue #3.





Images 3.10-3.11 Undersized culvert behind 45 Gates Pond Road which goes under a driveway and then under a barn. The culvert outlets on the west edge of the barn onto the property of 3033 VT-100.

5 WATER POOLING IN BASEMENTS AND YARDS

The lack of curbing along portions of Gates Pond Road allows roadway runoff to leave the travel lanes and enter adjacent private properties. Several property owners have reported water in their basements that they believe is associated with the road runoff, including properties at 64 Gates Pond Road and 22 Gates Pond Road.





Images 3.12-3.13 The lack of curbs in the sidewalks along Gates Pond Road allow water to enter private properties.

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6 NO DELINEATION BETWEEN SIDEWALK AND ROAD ON GATES POND ROAD

On Gates Pond Road the absence of curbing also allows roadway runoff to enter the gravel parking area of 64 Gates Pond Road. The parking area was reconstructed in 2025; however, significant deterioration and damage were observed during a site review in April 2026. The condition of the parking area should be evaluated in relation to the volume and frequency of roadway runoff entering the site, as well as the adequacy of existing surface drainage and sub-grade conditions.





Images 3.14-3.15 Erosion of the gravel parking lot at 64 Gates Pond Road.

7 AGGREGATES ON THE SIDEWALK

The existing sidewalk along the northeast side of Gates Pond Road experiences recurring accumulation of sand and aggregate. The material appears to be deposited during winter roadway sanding operations and subsequently accumulate on the sidewalk. Residents report substantial quantities of sand and aggregate must be removed from the sidewalk each spring. This condition makes the sidewalks difficult for pedestrians to use, particularly those using mobility devices.





Images 3.16-3.17 Most of the existing sidewalks on the northeast side of Gates Pond Road have significant amounts of sand/aggregate deposited on them.

To summarize, the drainage conditions along Gates Pond Road involve multiple interconnected issues that contribute to flooding hazards and erosion, particularly in lower lying areas. The majority of the stormwater in the Project Area enters the East Branch with no pretreatment. Inadequate or undersized conveyance features, roadway runoff entering private properties, and limited roadway drainage infrastructure appear to contribute to localized ponding, icing, erosion, property impacts, and recurring maintenance issues.

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04. CONCEPTUAL DESIGN

Image 4.0 The northwest corner at the intersection of Gates Pond Road and VT-100.

With multiple interconnected stormwater issues throughout the Project Area, design solutions that could address multiple problems were the focus of the design wherever possible.

In addition to the reduction of flooding/ stormwater hazards and erosion issues, reducing the amount of untreated stormwater into the East Branch is also a project priority.

The proposed interventions are shown on the conceptual plan in Image 4.4 and are summarized as follows:

(1) WALL REBUILD AND PARK REDESIGN

In order to address the degraded wall in the town-owned park, a full replacement of this section of the retaining wall is likely necessary. Further investigation into the condition of the existing catch basins and pipes with cameras would also be an important step in better assessing how much, if at all, the existing stormwater infrastructure is contributing to the wall degradation. To reduce the flow of untreated stormwater into the river and reduce hydraulic pressure on a future retaining wall, new sidewalks to better control stormwater flow, bioretention areas along the road, and permeable paving for the parking area, could be included in a replacement wall construction project. This would improve water quality, volume, and safety in the immediate area. Segmental retaining walls are recommended for their high performance and ease of installation.







Images 4.1-4.3 Examples of segmental retaining walls along rivers.

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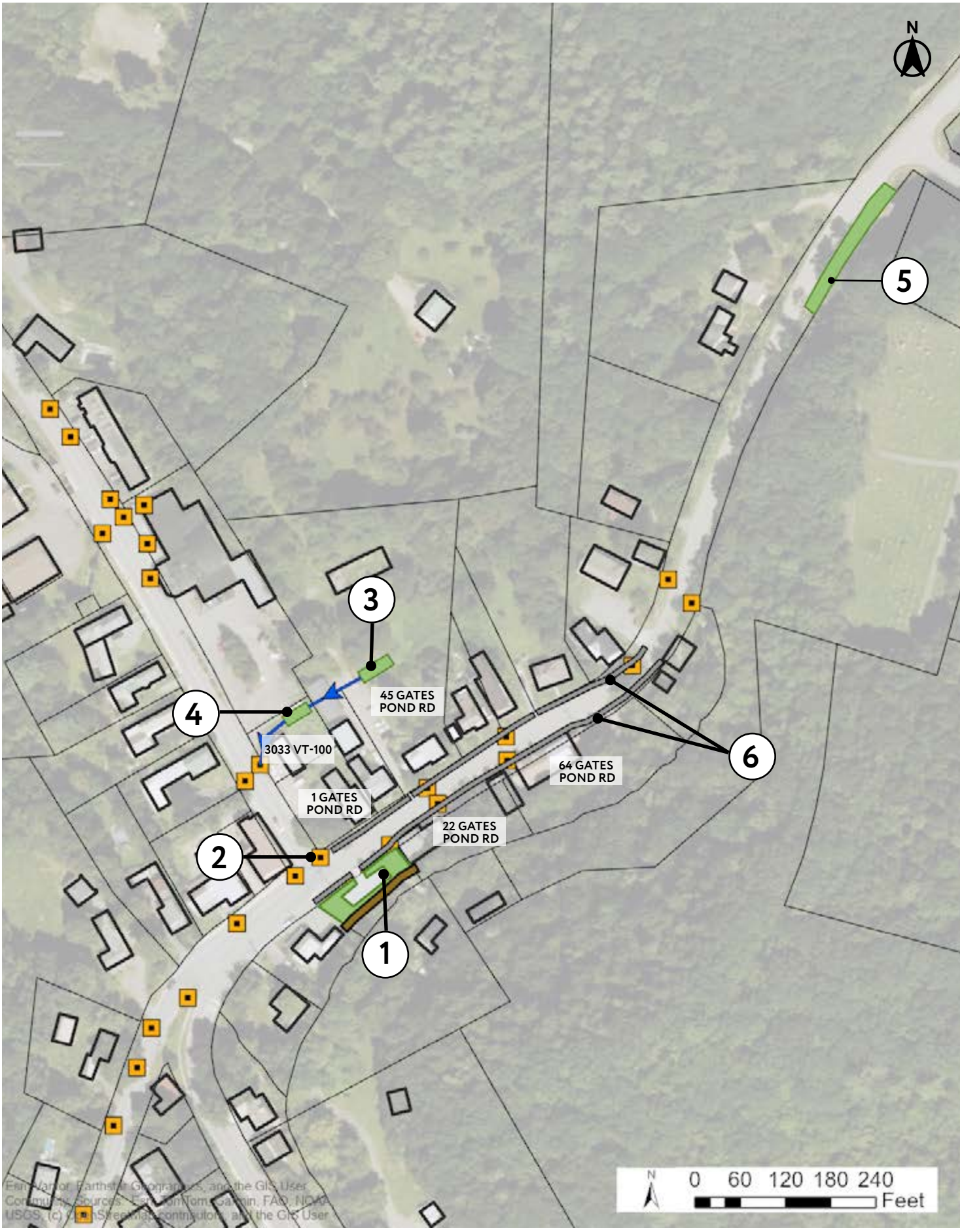


Image 4.4 Proposed potential projects.

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2 LOWER CATCH BASIN

Lowering the catch basin at the intersection of Gates Pond Road and VT-100 is recommend to capture more stormwater than is currently occurring. (Note: at time of writing, the ownership of this catch basin is unclear.)

3 MANAGE STORMWATER BEHIND 45 GATES POND ROAD

By better managing stormwater in the back yard of 45 Gates Pond Road, the total amount of stormwater that flows onto the property at 3033 VT-100 and eventually to VT-100 could be reduced. This could be achieved by adding a bioretention area or other infiltration/storage practice onto the property at 45 Gates Pond Road. There is an existing swale that is too shallow that then flows into an undersized culvert that runs under the existing barn. Both the swale and culvert could be resized to improve conveyance and capacity. By adapting the existing swale into a bioretention area with deep rooted, native vegetation and amended soils that increase infiltration, the area could manage a much larger volume prior to leaving the site. The area to the northeast of the culvert is currently vegetated and does not have buildings or other infrastructure, which makes it a good candidate for green stormwater practices.

4 MANAGE STORMWATER BEHIND 3033 VT-100

Similar to 45 Gates Pond Road, more stormwater could be captured and infiltrated on site at 3033 VT-100. Currently, much of the stormwater from a large drainage area to the north flows around the building on this property. A bioswale or bioretention area in the back of the building could be another step in a series of practices to reduce overall flow and improve water quality prior to reaching the East Branch. An overflow control structure, such as a riser or weir, would also reduce potential hazards for nearby 1 Gates Pond Road parking area and along the stretch of road between this property and the intersection of Gates Pond Road and VT-100.





Images 4.5-4.7 Examples of bioretention areas.

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5 BIORETENTION IN RIGHT-OF-WAY (ROW) OF GATES POND

In order to reduce the quantity of stormwater down slope, a bioretention area along the higher elevations of Gates Pond Road could be developed. Bioretention areas should not be built on slopes in excess of 10% and much of the development along Gates Pond Road is close to the edge of pavement leaving a limited number of potential locations for stormwater management within the ROW. The best potential location identified is at the northeast end of the Project Area along the Town owned cemetery property. Further site assessments would be needed to confirm that the soils have good infiltration capacity and that the retaining wall for the river would not be compromised prior to moving a project forward.



Image 4.8-4.10 Examples of bioretention areas in a ROW.

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6 NEW CURBED SIDEWALKS & HYDRODYNAMIC SEPARATORS

There are existing sidewalks, primarily on the northeast side, along Gates Pond Road but due to repaving of the roadway, they have become flush with the road. To prevent stormwater from overflowing the road, bringing water closer to homes and into the river without pretreatment, as well as depositing sand and other aggregates onto the sidewalk, curbing should be added to the sidewalks on Gates Pond Road. These new curbs should be paired with a series of angled grates to direct the stormwater into a series of hydrodynamic separators.

By adding curbing along the road, stormwater will be directed into these hydrodynamic separators via the angled grates, helping to direct the water away from where it is currently causing damage. Once in the hydrodynamic separator, stormwater is typically collected in an interior forebay. The stormwater is screened and separated from solids, floating trash, debris, and hydrocarbons. After being treated, stormwater is then able to exit the hydrodynamic separator via an underground pipe. The hydrodynamic separators should have sediment and pollutants cleaned out as part of regular maintenance.



Image 4.11 Grate with angled openings on the steeply sloped Eastern Avenue, St Johnsbury, VT.

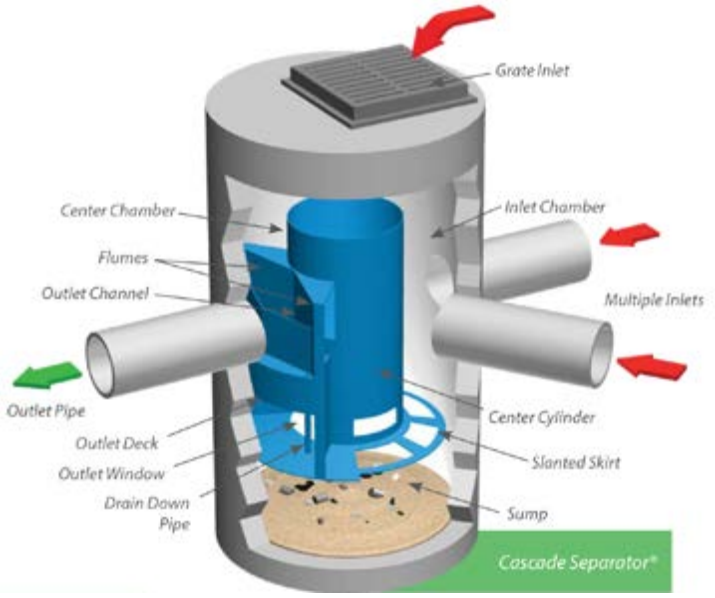


Image 4.12 Hydrodynamic separator example.

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#	PROJECT	OWNER	DESCRIPTION	WATER QUALITY IMPACT	FLOODING/HAZARD REDUCTION PUBLIC PROPERTY	FLOODING/HAZARD REDUCTION PRIVATE PROPERTY	PEDESTRIAN IMPROVEMENT	MAINTENACE COSTS	ESTIMATED COST (AFFORDABILITY)	SOCIAL/CULTURAL BENEFIT	ECOLOGICAL BENEFIT	OWNER INTEREST	TOTAL SCORE
1	**Wall Rebuild and Park Redesign**	Town of Whitingham	Park wall needs replacement, bioretention areas, sidewalks and new catch basins could be included to better manage stormwater as a part of a wall rebuilding project	2	4	0	2	5	1	5	4	5	28
2	**Lower Catch Basin**	State of Vermont/Town of Whitingham	Catch basin is currently too high, water misses the grate and puddles and freezes causing hazards for drivers and pedestrians	0	5	5	5	5	5	4	0	3	32
3	**Manage Stormwater Behind 45 Gates Pond Rd**	Private Property	Two undersized culverts on private property are leading to back ups. This water is also outletting directly onto the property at 3033 VT-100	2	3	5	2	2	2	0	5	5	26
4	**Manage Stormwater Behind 3033 VT RTE 100**	Consolidated Communications of Vermont	Stormwater is directed around the building which causes ponding and freezing hazards for 1 Gates Pond Road and VT-100	2	4	5	2	2	2	0	5	5	27
5	**Bioretention in ROW of Gates Pond Road**	Town of Whitingham	This project would capture stormwater runoff from the roadway and reduce the total amount lower down the hill of Gates Pond Road	2	3	2	1	2	3	2	5	5	25
6	**New Curbed Sidewalks & Hydrodynamic Separators**	Town of Whitingham	Catch basins along Gates Pond Road are outletting directly into the East Branch with no treatment. This project would allow for much higher volume of stormwater capture through improved catch basins and pretreatment with hydrodynamic separators	5	3	5	5	3	1	4	0	5	31

POTENTIAL PROJECTS ASSESSMENT MATRIX

To evaluate and prioritize the above-listed potential projects, the Project Team assessed each project for its applicability as a solution for the project area challenges. This assessment considered factors including volume and pollutant reduction potential, alignment with local and state priorities, cost, and social benefits. After weighing these factors against the needs of the project area, the Project Team created the above Assessment Matrix. This matrix weighs the proposed projects based on the listed criteria and ranks them accordingly. This analysis identified the following three projects as the most potentially beneficial to the Project Area:

Lower Catch Basin: By lowering the catch basin at the intersection of VT-100 and Gates Pond Road, stormwater from higher elevations that collects on VT-100 will be removed from the road surface and private properties. This lower cost and simple project will have a large impact on reducing potential hazards. There will, however, be no ecological benefit as it would not include pre-treament.

New Curbed Sidewalks and Hydrodynamic Separators: Of all of the proposed projects, this project will most directly impact the water quality of stormwater runoff flowing into the East Branch. Additionally, by directing stormwater into hydrodynamic separators with sidewalk curbing, stormwater will be diverted away from private properties along Gates Pond Road. This project would also reduce flooding issues at the lowest elevations of the project area by capturing and treating more stormwater upstream.

Wall Rebuild and Park Redesign: The current wall is in urgent need of replacement and poses a significant potential hazard to public safety. As part of this replacement process, the Town will have the opportunity to redesign the park and capture more stormwater before it enters the river via bioretention and pervious paving. This project therefore will contribute to public safety, improve a public space, and assist in improving water quality.

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Image 5.0 Town Park

05. IMPLEMENTATION

This study is a first step in supporting the Town of Whitingham in designing, permitting, and funding the stormwater management features discussed in the previous chapters. This Implementation chapter outlines steps needed to take the plans from concepts to buildable projects that invest in safety and the protection of property and natural resources in the Project Area.

Step 1 - Selectboard Approval

Before any of these improvements are constructed, the projects, whether phased or as a whole, should be approved by the Whitingham Selectboard. This includes the physical changes as well as the cost to the Town of providing potential matching funds for such a project. For projects of this scale, it is anticipated that the matching cost to Whitingham could be approximately 20% of total project costs.

In addition, any work to be completed along VT-100 require seasonal maintenance costs, outlined in an MOU with VTrans. This should be coordinated with the town Highway Department and others.

Step 2 - Submission to the Clean Water Initiative Program

Each of the projects presented in this report will be submitted to the Clean Water Initiative Program for inclusion in the Watershed Projects Database, which is used by VT DEC to review, screen, prioritize, track, and report on DEC-funded clean water projects in Vermont. Potential projects such as the ones discussed above can be identified by DEC or other partners, such as Windham Regional Commission or the Windham County Conservation District for funding applications.

Step 3 - Landowner Engagement

The Town should continue to engage with private landowners and stakeholders to obtain written permission for construction of proposed projects. Should projects move to design and construction, temporary and permanent easements will be required for constructions as well as a permanent right-of-way for ongoing maintenance of the project.

Step 4 - Project Prioritization

The Town should continue to evaluate and prioritize projects as they align with short- and long-term goals, funding opportunities, and budgets, and obtain landowner acceptance. Continuing to work with Windham Regional Commission to help prioritize and guide projects will be beneficial in achieving implementation.

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			Wall Rebuild and Park Redesign		Lower Catch Basin		Manage Stormwater Behind 45 Gates Pond Rd		Manage Stormwater Behind 3033 VT RTE 100		Bioretention in ROW of Gates Pond Road		New Sidewalk with Granite Curb	
Description	**Unit**	**Unit Cost**	**Qty**	**Cost**	**Qty**	**Cost**	**Qty**	**Cost**	**Qty**	**Cost**	**Qty**	**Cost**	**Qty**	**Cost**
5' Concrete Walk	lf	$388	129	$50,026									1010	$391,678
Granite Curb	lf	$88	129	$11,352									1010	$88,880
Excavation of Surfaces and Pavements	cy	$61	12	$732	5	$305	30	$21,960	25	$1,525	5	$3,660	15	$915
Subbase of Dense Graded Crushed Stone	cy	$67	84	$5,628	5	$335							101	$6,767
Bituminous Concrete Pavement	ton	$160	8	$1,280	6	$960							30	$4,800
New Catch Basin	ea	$8,500	2	$17,000	1	$8,500			1	$8,500	1	$8,500	6	$51,000
Traffic Control	ls	$40,000											1	$40,000
Retaining Wall	lf	$2,000	250	$500,000										
Relocate Utility Pole	ea	$11,600											4	$46,400
Biorention Areas	sf	$35	1000	$35,000			500	$17,500	750	$26,250	1100	$38,500		
Landscaping/Plants	sf	$25	500	$12,500			500	$12,500	750	$18,750	1100	$27,500		
Piping	lf	$15	100	$1,500										
New Culvert	lf	$60					100	$6,000						
Hydrodynamic Separator	ea	$24,000											3	$72,000
Mobilization / Demobilization (10% of beyond typical items)			1	$6,828	1	$101	1	$580	1	$550	1	$782	1	$7,186
Subtotal Construction				$689,646		$10,201		$58,540		$55,575		$78,942		$725,801
Approx. 30% Contingency				$206,894		$3,060		$17,562		$16,673		$23,682		$217,740
OPCC, Conceptual				**$896,540**		**$13,261**		**$76,101**		**$72,248**		**$102,624**		**$943,541**
Engineering and Administration Costs (22%) plus Construction Engineering (14%), adjusted for rounding**				**$322,755**		**$4,774**		**$27,397**		**$26,009**		**$36,945**		**$339,675**
Total Project Cost, Estimated				**$1,219,295**		**$18,035**		**$103,498**		**$98,257**		**$139,569**		**$1,283,216**

Step 5 - Fundraising & Grant Writing

Funding opportunities are available through the VT DEC and VT Agency of Transportation (VTrans) for water quality improvement projects. The DEC Clean Water Initiative administers various grants such as the Design/Implementation Block Grant for water quality improvement projects statewide. VTrans Municipal Assistance Section also administers grants such as the Transportation Alternatives and Municipal Mitigation grants for water quality projects. Working with Windham Regional Commission to help prepare grant applications and guide projects will be beneficial in achieving implementation.

Step 6 - Survey, Design & Permitting

Once selected for a grant through DEC or VTrans, the next step for the Town will be to retain the services of a consultant to design and permit the funded project. The consultant will develop Engineering Designs and obtain permits in accordance with the standards of the specific funding source(s), and provide assistance through project construction.

PROJECT PHASING

Example of Project Timeline:

1. Obtain Grant Funding - 1 year, assuming acceptance in first year
2. Engineering Design & Permitting - 1-2 years, depending on complexity of obtaining permits and easements
3. Construction/Implementation - 1 year

Links for funding sources:

https://vtrans.vermont.gov/highway/Municipal-Highway-and-Stormwater-Mitigation-Program

https://dec.vermont.gov/water-investment/cwi/clean-water-grants/funding-opportunities

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