PROJECT IDENTIFICATION

TOWN OF GLASGOW

BLUE RIDGE ROAD MOUNTAIN SLOPE DRAINAGE CHANNEL IMPROVEMENTS

Location Description

37.64012, -79.45523

Drainage way descending in parallel with Blue Ridge Road into the northwestern end of town.

Project Issue

Stormwater drainage and erosion — concentrated mountain slope runoff causing bank erosion along drainage channel on private properties along the northern/eastern side of Blue Ridge Road (**Figure 1**). Some riprap channel stabilization has already been installed in isolated sections.

Project Purpose

Stabilize eroding channel banks to protect properties along Blue Ridge Road.

Identified Constraints

a. Easements - channel runs through private property
b. Adjacent road and potential VDOT cooperation

Additional Information Needed

a. Presence of utilities
b. Rate of erosion

Project Proposal and Planning-Level Cost Estimate

The drainage channel along Blue Ridge Road has pervasive erosion and instability issues, leading to widespread bank failure and property loss for landowners along this 1,800 ft reach. A channel restoration and bank stabilization project from Blue Ridge Road downstream to Shawnee Street could protect houses and other infrastructure in the area. In isolated sections, the channel banks have been reinforced with riprap (**Figure 2**) or gabion baskets (**Figure 3**). The floodplain is narrow and in many places the channel appears to have downcut, deepening the channel with steeper banks more prone to failure during erosive storm events. Restoring the channel where possible by creating inset floodplain benches to slow erosive storm flows, installing stone toes or channel structures to further protect the channel, and planting native vegetation to further stabilize the corridor with their root systems will all serve to protect infrastructure along the channel corridor and slow water flowing down the mountain towards the center of town. Surrounding structures and infrastructure may limit floodplain bench creation to one side of the channel on average, but planting can be established throughout. This type of project would require cooperation from those that own the property that the drainage path crosses, which is a noted concern of Town staff.

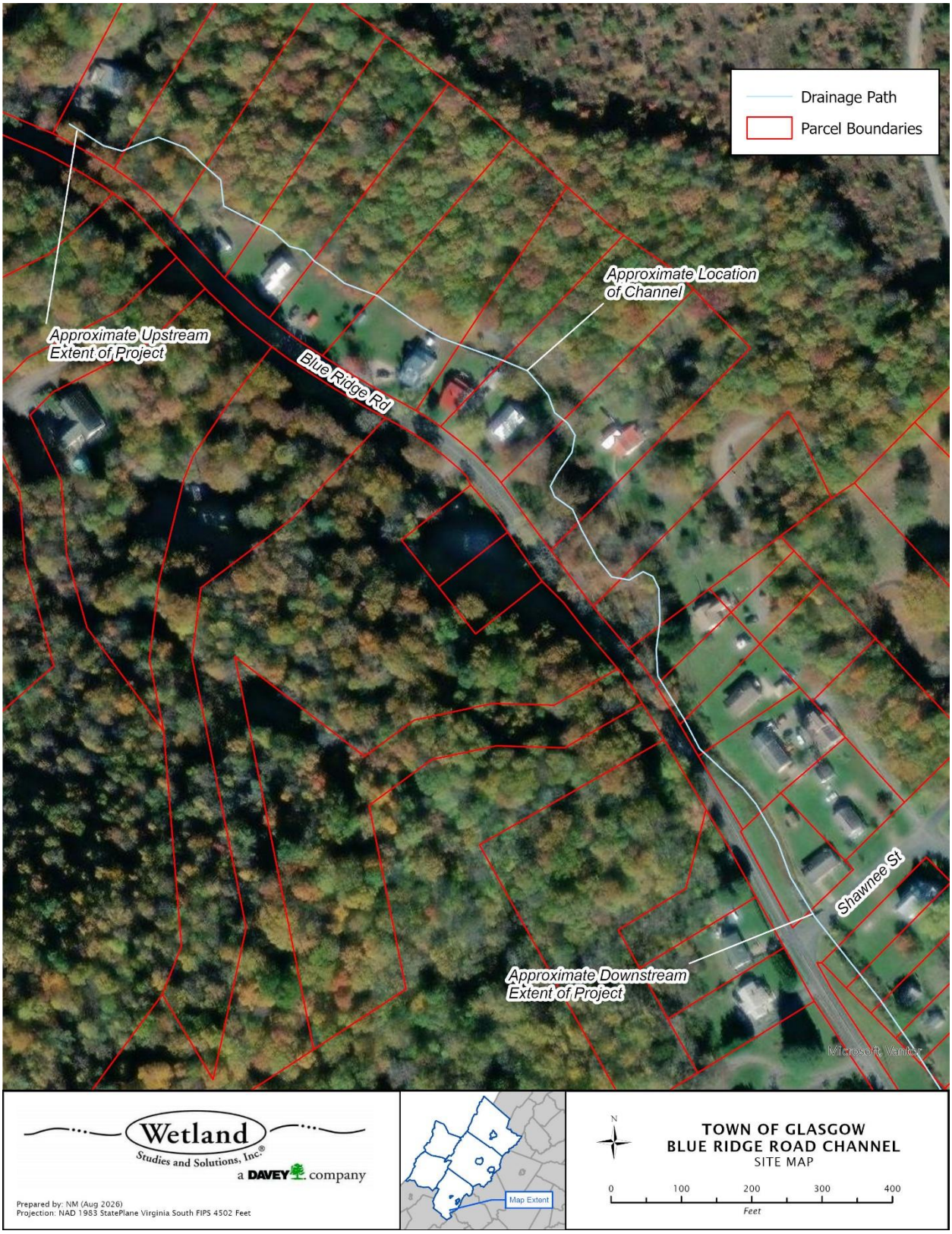

Figure 1. Site map noting the approximate path of the drainage channel and the private properties it crosses along Blue Ridge Road.



Figure 2. Drainage channel with riprap protection on banks upstream of Shawnee Street. Photograph taken facing upstream (northwest).



Figure 3. Drainage path that has incised down, with gabion baskets reinforcing the bank. Photograph taken facing downstream (southeast).

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Survey and Design					**$119,000**
Construction Administration and Oversight					**$55,000**
Access and ESC					**$41,700**
Construction					**$422,000**
Stakeout and As-Built	1	LS	$36,000	$36,000	
Mobilization	1	LS	$28,000	$28,000	
Excavation and Hauling	2,000	CY	$100	$200,000	
Grading	1	AC	$8,000	$8,000	
Grade Control Structures	5	EA	$30,000	$150,000	
Planting					**$128,000**
Native Seed and Natural Fiber Matting	4,000	SY	$12	$48,000	
Live Stakes	3,600	EA	$10	$36,000	
Tubelings	5,500	EA	$8	$44,000	
Contingency (30%)					**$229,710**
TOTAL ESTIMATED BUDGET					**$995,410**

The table above presents the estimated costs associated with the existing conditions survey, design, and anticipated permitting (VADEQ, USACE) as well as construction and planting efforts of a stream stabilization project along Blue Ridge Mountain Road. In the early design stages, it may become apparent that implementation could take a phased approach (e.g. and upstream portion of the reach first then later return to address a downstream portion), but that assessment will require additional field evaluation and data collection.

Possible Alternatives and Additional Considerations

Design alternatives for this project are limited by the adjacent roadway and structures on private properties. Residents in the area have expressed their desire for the Town to install more riprap along the channel to target the erosion and protect homes. Lining the channel with riprap, or use of similar channel hardening measures such as gabion baskets or concrete/imbricated stone walls, provide little ecological benefit and can require greater maintenance over time than the nature-based solution recommended, especially if there are failures that need repair.

<u>TMDL/MS4 Considerations</u>

The drainage channel along Blue Ridge Road eventually drains into the Maury River, which has an approved TMDL for PCBs and bacteria. Bank stabilization and channel restoration in this site would be unlikely to provide reduction of either of these pollutants.

Assumptions

Watershed (via StreamStats 8/24/2026) is 0.68 square mile, taken from intersection of Shawnee St and Blue Ridge Rd. An estimated 1,800 linear feet of channel restoration proposed along Blue Ridge Road, with a 10-foot wide riparian buffer establishment proposed on one side.

Recommended Next Steps

Reach out to VDOT for sizing calculations of the existing culverts. Gauge and/or develop landowner support for project prior to initiating design stages.

References

USGS. StreamStats v4.33.0. Accessed online 24 August 2026.

Virginia Tech Department of Biological Systems Engineering. 2013. Bacteria Total Maximum Daily Load Development for Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Maury River and Cedar Creek and a Sediment Total Maximum Daily Load Development for Colliers Creek

Virginia Tech Department of Biological Systems Engineering. 2025. PCB Total Maximum Daily Load Development for the Middle and Upper James River, Maury River, and Jackson River Watersheds

PROJECT IDENTIFICATION

TOWN OF GLASGOW

POCAHONTAS STREET / 2ND STREET / SHENANDOAH ROAD DRAINAGE CORRIDOR IMPROVEMENTS

Location Description

37.64346, -79.44205

Corridor between Norfolk Southern railroad and Pocahontas Street in the vicinity of 2nd Street; Shenandoah Road is an unopened publicly owned ROW running along the railroad tracks through this corridor (**Figure 1**).

Project Issue

Stormwater drainage and flood risk — mountain slope runoff concentrates through this residential corridor via a network of drainage channels passing through/between private properties. Norfolk Southern railroad embankment impounds water on the north side during significant events. Town staff report that residents experience genuine fear of flooding with limited self-evacuation capability.

Project Purpose

Attenuate runoff and convey stormwater through the town's most vulnerable low-income residential corridor to reduce impact of flooding.

Identified Constraints

a. Probability of additional land acquisition and/or easements necessary
b. Infrastructure – sewer lines noted along RR tracks, estimated about 2-3 ft deep
c. Potential for Norfolk Southern/VDOT involvement

Additional Information Needed

a. Exact locations of infrastructure and utilities (particularly sewer lines)
b. H&H study
c. Depth to groundwater/bedrock
d. Maintenance easements for drainage channels running through private property

Project Proposal and Planning-Level Cost Estimate

The Town-owned corridor of the undeveloped Shenandoah Road provides an opportunity to implement infiltration and/or stormwater detention practices to reduce the impacts of stormwater flooding. Improvements in this site are closely tied to the project identified to improve the primary town drainage channels associated with 4th, 6th, and 7th Streets, and that project identifies the culverts under the railroad near 2nd Street for improved debris rack installation (**Figure 2)**.

It is possible that adding stormwater storage capacity in the form of an infiltration and/or detention practice along the Shenandoah Road corridor could provide protection for nearby residences when inflow to the area exceeds the capacity of the culverts under the railroad tracks (**Figure 1**). This can be verified with an H&H study. The design would be constrained by the nearby railroad property and the sewer lines that run within the vicinity but could effectively collect water from the drainage system in the neighborhood and then release the water through the culverts under the railroads as capacity allows. The excavated volume of the detention pond would provide an area for flood water storage, decreasing the impact of water on properties within the vicinity.

The existing drainage ditch that runs parallel to the railroad tracks can also be re-graded to add some increased storage capacity while still maintaining positive drainage to each of the culverts under the railroad tracks (**Figure 3**).



Figure 1. Drainage corridor site with existing infrastructure and proposed improvements marked.



Figure 2. Debris grates covering the railroad culvert near 2nd Street.



Figure 3. Existing drainage ditch that runs parallel to the railroad tracks. Photograph taken facing southwest.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Survey and Design					**$94,000**
Construction Survey and Inspections					**$25,000**
Access and Erosion/Sediment Control					**$58,400**
Construction - Detention Basin					**$458,600**
Stakeout	1	LS	$18,000	$18,000	
As-Built Survey	1	LS	$18,000	$18,000	
Mobilization	1	LS	$25,000	$25,000	
Excavation and Hauling	5000	CY	$75	$375,000	
Grading	0.8	AC	$7,000	$5,600	
Outlet Structure	1	EA	$5,000	$5,000	
Permanent Seeding and Straw	4000	SY	$3	$12,000	
Contingency (30%)					**$190,800**
TOTAL ESTIMATED BUDGET					**$826,800**

The table above presents estimated costs to complete an existing conditions survey, develop an H&H model of the area of concern, and develop a design for and then construct an approximately 1400-foot linear detention corridor along the Shenandoah Road right-of-way parallel to the railroad.

Possible Alternatives and Additional Considerations

Work at this site is closely tied with the project identified nearby at 4th/6th/7th Street and cost savings, particularly in the data collection and design development stages, could be obtained by considering these projects together.

Town officials have identified parcels in the area near the Community Center that could be considered for installing a stormwater control measure such as a bioretention basin within the neighborhood. Unfortunately, this property is not situated in the best position to collect substantial amounts of stormwater. In case property acquisitions/easements may not readily be procured in the lower end of the landscape, this site should be considered in the preliminary design stages as an alternative.

Rainwater harvesting and infiltration practices could also be encouraged throughout the community to decrease the volume of water that these drainage ditches experience. The Natural Bridge Soil and Water Conservation District (NBSWCD) administers the Virginia Conservation Assistance Program (VCAP), which can be another source of funding for such residential projects.

Town Context

The Town of Glasgow has noted that this area has a high minority population and predominantly very low income residents. Many of these residents do not have access to vehicles or other forms of transportation, making them even more vulnerable to dangers during flooding. Residents have genuine fears surrounding floods, with uncertainty whether they would be able to safely self-evacuate during floods. Thus, flood mitigation and protection measures in this area are important to ensure the safety of these residents.

TMDL/MS4 Considerations

The stormwater infrastructure eventually drains into the Maury River, which has an approved TMDL for PCBs and bacteria. Proposed work in this site would be unlikely to provide reduction of either of these pollutants.

Assumptions

Watershed (via StreamStats 8/24/2026) is 0.36 square miles, taken from intersection with railroad. Approximately 1400 linear feet identified for the detention corridor with a width of 25 ft.

Recommended Next Steps

Reach out to Norfolk Southern regarding sizing calculations of the existing culverts. Gauge and/or develop resident support for project prior to initiating design stages.

References

USGS. StreamStats v4.33.0. Accessed online 24 August 2026.

Virginia Tech Department of Biological Systems Engineering. 2013. Bacteria Total Maximum Daily Load Development for Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Maury River and Cedar Creek and a Sediment Total Maximum Daily Load Development for Colliers Creek

Virginia Tech Department of Biological Systems Engineering. 2025. PCB Total Maximum Daily Load Development for the Middle and Upper James River, Maury River, and Jackson River Watersheds

PROJECT IDENTIFICATION

TOWN OF GLASGOW

PRIMARY TOWN DRAINAGE CHANNEL IMPROVEMENTS — 4TH, 6TH, AND 7TH STREETS

Location Description

37.641324, -79.446385

Three primary drainage channels convey runoff from surrounding mountain slopes through the Town to the James and Maury Rivers; channels are associated with 4th Street, 6th Street, and 7th Street (**Figure 1**). Multiple channels cross under/through the Norfolk Southern railroad embankment.

Project Issue

Stormwater channel maintenance and capacity — the town's only stormwater conveyance system; sediment and debris accumulation reduces flow capacity; channels are sufficient for normal events when clean but cannot handle extreme storms regardless of condition; town public works (two staff) responsible for all monitoring and clearing

Project Purpose

Maintain and improve the town's only stormwater conveyance system to better handle routine and moderate rain events; assess channel condition and identify capital improvements that reduce long-term maintenance burden given very limited public works capacity

Identified Constraints

a. Probability of land acquisition and/or easements necessary
b. Coordination with VDOT and Norfolk Southern
c. Limited Town maintenance staff
d. Presence of utilities and infrastructure

Additional Information Needed

a. H&H study
b. Location of utilities
c. Depth to groundwater/bedrock
d. Existing easements for drainage channels through private property

Project Proposal and Planning-Level Cost Estimate

To adequately understand and address the drainage issues experienced along 4th, 6th, and 7th Streets (**Figure 1**) in the Town of Glasgow, a survey of the existing stormwater infrastructure and an H&H study should be conducted. This would quantify runoff and identify limitations of the drainage

system. The culverts running under the railroad are a known constriction (larger box culverts convey flow from under the tracks beneath the Mohawk facility and out to the Maury River).

The Town has cited debris and sediment buildup as a known cause of flooding along these roads. Trash and debris have previously clogged the culverts under the railroad tracks (**Figure 2**) and likely clog the culverts and other constrictions along the drainage paths. Following coordination with Norfolk Southern, improved debris racks could be installed at each of the culverts to improve performance. Though public works staff is limited and much maintenance and debris removal already occurs, a formal maintenance and debris removal schedule should be developed to ensure timely debris removal, with extra monitoring visits before larger storm events, to streamline tracking processes.

Additionally, many of the culverts along the contributing ditches, and the ditchlines themselves, have excessive sediment accumulation, severely decreasing their capacity (**Figure 3**). Culverts and ditches should be cleared to restore the original conveyance capacity, allowing water to flow freely during extreme storms.

Added flood mitigation could be gained by constructing a dry, vegetated swale in the already clear area between 4th Street and the railroad tracks (**Figure 4**). This would increase the conveyance and infiltration of stormwater along this drainage path, reducing the severity of flooding between Pocahontas Street and the railroad.



Figure 1. Location map highlighting important existing and proposed drainage infrastructure.



Figure 2. Rebar debris racks on double culverts under railroad in line with drainage from 4th Street.



Figure 3. Largely buried culvert at the intersection of 4th Street and Pocahontas Street.



Figure 4. Drainage ditch between 4th Street and the railroad tracks, identified as a potential swale location.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Phase 1 Stormwater Study					**$97,500**
Northern Glasgow Stormwater Study					**$75,000**
Existing Conditions Survey	1	LS	$35,000	$35,000	
H&H Study	1	LS	$40,000	$40,000	
Phase 1 Contingency (30%)					**$22,500**
Phase 2 Ditch Revitalization					**$314,314**
Ditch Revitalization Design					**$20,000**
Ditch Revitalization Administration and Oversight					**$15,000**
Ditch Revitalization Access and ESC					**$54,100**
Ditch Revitalization Construction					**$152,680**
Debris Racks	6	EA	$1,500	$9,000	
As-Built Survey	1	LS	$18,000	$18,000	

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Ditch Excavation	4000	LF	$30	$120,000	
Permanent Seeding	28	LB	$10	$280	
Erosion Control Matting	2700	SY	$2	$5,400	
Phase 2 Contingency (30%)					**$72,534**
Phase 3 Dry Swale					**$272,259**
Dry Swale Design					**$30,000**
Dry Swale Administration and Oversight					**$15,000**
Dry Swale Access and ESC					**$8,000**
Dry Swale Construction					**$156,430**
Mobilization	1	LS	$8,530	$8,530	
Excavation and Hauling	400	CY	$65	$26,000	
Grading – rough	0.1	AC	$7,000	$700	
Dry Swale	400	CY	$300	$120,000	
Permanent Seeding and Straw	400	SY	$3	$1,200	
Phase 3 Contingency (30%)					**$62,829**
TOTAL ESTIMATED BUDGET					**$684,073**

The table above presents estimated costs for three phases of work. Phase 1 incorporates an existing conditions survey and an H&H study to assess the current condition of the stormwater system and identify constrictions. Phase 2, which could occur before Phase 1 but may benefit from the information developed in Phase 1, incorporates the re-establishment of the existing ditch lines and clearing of partially obstructed culverts, as well as the installation of improved debris racks on the culverts running under the railroad. The debris rack installation should occur only after coordination with and approval of railroad entities. The ditch revitalization access and ESC incorporates a set-aside for traffic control which may prove less expensive in practice given the low anticipated traffic. Phase 3 proposes the design and installation of a dry swale between 4th Street and the railroad, which can only occur after being informed by the study developed in Phase 1.

Possible Alternatives and Additional Considerations

Work at this site is closely tied with the project identified nearby at the Pocahontas Street/2nd Street intersection and cost savings, particularly in the data collection and design development stages, could be obtained by considering these projects together. Additionally, while the corridor extending from 4th Street was chosen as the most viable location for a dry swale as it is already largely clear of trees, it is possible that the H&H analysis of the system would indicate benefits from another dry swale extending from 5th Street.

The H&H study should evaluate whether the culverts running under the railroad might be inadequately sized. However, the Town's options for improving the culvert crossing if deemed inadequate would be limited. Rainwater harvesting and infiltration practices could also be encouraged throughout the community to decrease the volume of water that these drainage ditches experience. The Natural Bridge Soil and Water Conservation District (NBSWCD) administers the Virginia Conservation Assistance Program (VCAP), which can be another source of funding for such residential projects.

TMDL/MS4 Considerations

The stormwater infrastructure eventually drains into the Maury River, which has an approved TMDL for PCBs and bacteria. Proposed work in this site would be unlikely to provide reduction of either of these pollutants.

Assumptions

Watershed (via StreamStats 8/21/2026) is 0.18 square miles along 4th and 6th Street.
All culverts are assumed to be in good condition, aside from sediment deposition, and no culvert replacements are included in the estimated budget. Approximately 4,000 linear feet of ditch lines are assumed to be needing revitalization. Double culverts under railroad tracks were identified in three places for upgraded debris racks. The dry swale is approximated at 180 lf at a width of 20 feet.

Recommended Next Steps

Reach out to Norfolk Southern regarding upgrading debris racks on culverts. Determine whether priority lies in study development or immediate ditch revitalization.

References

USGS. StreamStats v4.33.0. Accessed online 21 August 2026.

Virginia Tech Department of Biological Systems Engineering. 2013. Bacteria Total Maximum Daily Load Development for Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Maury River and Cedar Creek and a Sediment Total Maximum Daily Load Development for Colliers Creek

Virginia Tech Department of Biological Systems Engineering. 2025. PCB Total Maximum Daily Load Development for the Middle and Upper James River, Maury River, and Jackson River Watersheds

PROJECT IDENTIFICATION
TOWN OF GLASGOW
TOWN HALL BIORETENTION BMP RESTORATION AND MAINTENANCE

Location Description
37.63435, -79.45075
Bioretention BMP (Best Management Practice) in front of Glasgow Town Hall

Project Issue
Green infrastructure maintenance — existing bioretention BMP suspected improperly maintained by public works staff who cut back the designed vegetation, which could reduce the BMP's stormwater function and aesthetic value; root systems are intact and regrowth is expected; no redesign or reconstruction needed.

Project Purpose
Restore bioretention BMP function and appearance.

Additional Information Needed
a. BMP design and as-built information
b. Type and health of plantings
c. Existing maintenance plan

Project Proposal and Planning-Level Cost Estimate
To properly address the concerns regarding the bioretention BMP next to the Town Hall (**Figure 1**), it would first be recommended to evaluate the original design plans. This would allow the Town to determine if there is an existing maintenance plan that was written into the design. If this does not exist, a maintenance plan and schedule should be created, potentially with the consultation of the original designer. This would give Public Works staff clear and concise instructions on the type and frequency of maintenance for the BMP, allowing future workers to be easily trained on the maintenance requirements. Town staff also voiced concerns regarding the reestablishment of vegetation within the BMP after the cutting. The roots of these plants were still alive, and much of the vegetation has since grown back (**Figure 2; Figure 3**). The species of plantings can be verified with the existing planting plan to ensure that the current plants are the intended varieties. This would ensure that the BMP is functioning as intended, with proper pollutant removal, and that invasive species are not established in the structure. The health of these plants should also be verified to make sure the BMP remains effective.

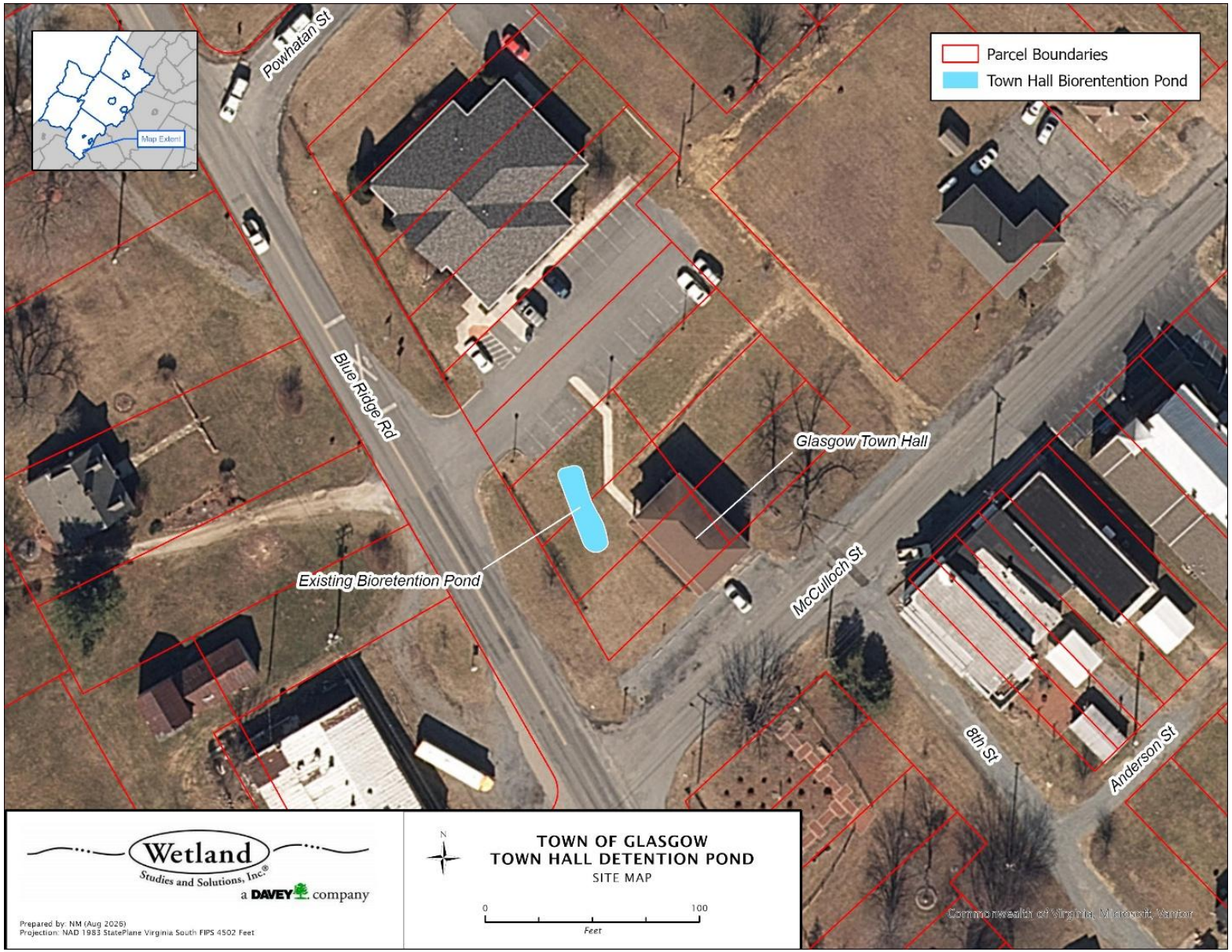

Figure 1. Bioretention BMP on Town Hall property with local roads and property boundaries marked.



Figure 2. Bioretention BMP on the Town Hall's property. Photograph taken facing northwest.



Figure 3. Vegetated bioretention BMP with the Town Hall pictured in the background. Inlet is lined with riprap, with outlet and riprap pictured on the right. Photograph is taken facing southeast.

As this is entirely a matter of plan review and the maintenance duties already being fulfilled by Town staff, a planning-level cost estimate was not developed for this project, though prioritization of this work by staff would ensure the continued effectiveness of the bioretention BMP.

Possible Alternatives and Additional Considerations

If an assessment of the existing plants finds that certain specimens are unhealthy or the incorrect species have grown, then removal and revegetation may be recommended. The Town has already identified that a redesign or reconstruction of the bioretention BMP is unnecessary, as it is only the vegetation under concern while the hydraulics of the BMP appear to function as designed.

TMDL/MS4 Considerations

The site eventually drains into the Maury River, which has an approved TMDL for PCBs and bacteria. Being a maintenance activity, this project will not provide additional reduction of either of these pollutants.

Assumptions

The bioretention BMP is assumed to be functioning as designed.

Recommended Next Steps

Review design and as-built documentation to determine original maintenance plan. Verify if any grant funding that may have been used for BMP installation had associated requirements.

References

USGS. StreamStats v4.33.0. Accessed online 27 August 2026.

Virginia Tech Department of Biological Systems Engineering. 2013. Bacteria Total Maximum Daily Load Development for Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Maury River and Cedar Creek and a Sediment Total Maximum Daily Load Development for Colliers Creek

Virginia Tech Department of Biological Systems Engineering. 2025. PCB Total Maximum Daily Load Development for the Middle and Upper James River, Maury River, and Jackson River Watersheds

PROJECT IDENTIFICATION
TOWN OF GLASGOW
WASTEWATER TREATMENT PLANT FLOOD VULNERABILITY IMPROVEMENTS

Location Description
37.62849, -79.44920
Town of Glasgow wastewater treatment plant in the FEMA floodplain adjacent to the James and Maury River confluence.

Project Issue
Critical facility flood vulnerability — plant sited within FEMA floodplain; the Town carries flood insurance on the facility at significant ongoing cost. The plant is undergoing major repairs to address deferred maintenance, in coordination with VADEQ — separate from flood risk but compounds overall facility vulnerability.

Project Purpose
Protect wastewater treatment infrastructure from flood damage, reduce public health and environmental risk from flood-related plant failure, and reduce ongoing flood insurance cost burden on the Town.

Identified Constraints
a. Located within FEMA floodplain
b. State and federal permitting may be required for structural improvements
c. Existing utilities and equipment
d. Need to limit disturbance of wastewater treatment plant operations

Additional Information Needed
a. H&H study
b. Design details of wastewater treatment plant

Project Proposal and Planning-Level Cost Estimate
The Town of Glasgow's wastewater treatment plant is located in the floodplain of the James and Maury Rivers (**Figure 1**, **Figure 2**), which poses a threat to this piece of critical infrastructure. It is recommended that the Town conducts a comprehensive survey and H&H study for the treatment plant and its surroundings to determine the flood elevation relative to equipment and infrastructure and analyze risks to the facility. This would inform the extent of flooding and the equipment that would be impacted, guiding flood-proofing efforts. It appears that some infrastructure at the treatment plant has already been elevated above the flood elevation (**Figure 3**); previous design plans would confirm this and provide additional information for the study. After this study is

conducted, a preliminary engineering report should be developed that identifies actions and projects to implement that would mitigate flooding impacts on site.



Figure 1. Site map displaying the wastewater treatment plant and its surroundings



Figure 2. Wastewater treatment plant infrastructure.



Figure 3. Electrical components within the plant are raised on the wall, presumably above the flood elevation.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Flood Impact Study					**$100,000**
Existing Conditions Survey	1	LS	$30,000	$30,000	
H&H Study	1	LS	$35,000	$35,000	
Preliminary Engineering Report	1	LS	$35,000	$35,000	
Contingency (30%)					**$30,000**
TOTAL ESTIMATED BUDGET					**$130,000**

The table above presents estimated costs for a survey of the facility, H&H study, and development of a PER. If the Town has an existing facility plan or engineering report for the plant, significant savings could be achieved by evaluating those documents against existing conditions.

Possible Alternatives and Additional Considerations

Design alternatives for this site would be dependent on the results of the H&H study and preliminary engineering report. Should the study determine that actions are necessary to protect this facility, there are some designs that could be implemented to mitigate the impacts of floods. Electrical and chemical equipment within the plant could be raised above the flood elevation. This would ensure the plant remains functional during these events, continuing service for residents. The Town could also floodproof this equipment so that it is operational, even in contact with flood water. It might also be necessary for roads and other ancillary infrastructure to be altered or raised in order to ensure access to the treatment plant during floods. Barriers, including a flood wall or levee, could be constructed to protect this structure. This alternative would likely require extensive permitting and confirmation that the flood elevation is not raised by the structure. Additionally, a flood emergency plan could be created for the facility, securing the safety of workers and operation of the wastewater plant during flooding.

TMDL/MS4 Considerations

The wastewater treatment plant lies in the floodplains of the Maury and James Rivers. The Maury River has an approved TMDL for PCBs and bacteria. The James River has an approved TMDL for PCBs due to exceedances in the screening value for PCBs in fish tissue. If the WWTP is impacted by a flood event, it could cause a pulse of bacteria contamination to the already impaired Maury River. Improvements or alterations to the wastewater treatment plant would be protective of conditions but would not necessarily assist in reaching bacterial reduction goals in the TMDL.

Additional Town Context

The Town has identified current issues with the wastewater treatment plant due to maintenance neglect, including sludge buildup and broken equipment. Efforts are ongoing to address these repairs of the wastewater treatment plant. These concerns do not have a direct effect on flood resilience or flood protection, but these maintenance and operations issues are a very high priority

for the Town and the current focus of funds and staff attention. Thus, flood mitigation projects are currently a secondary concern. However, considering both flooding and maintenance issues holistically may allow for application for a variety of funding sources that could be utilized concurrently (e.g. CFPF, VADEQ's Clean Water Revolving Loan Fund, USDA Rural Development, CDBG).

Recommended Next Steps

Evaluate any existing plans or documentation for the plant to determine what informational gaps need to be filled or data updated.

References

USGS. StreamStats v4.33.0. Accessed online 25 August 2026.

Virginia Tech Department of Biological Systems Engineering. 2013. Bacteria Total Maximum Daily Load Development for Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Maury River and Cedar Creek and a Sediment Total Maximum Daily Load Development for Colliers Creek

Virginia Tech Department of Biological Systems Engineering. 2025. PCB Total Maximum Daily Load Development for the Middle and Upper James River, Maury River, and Jackson River Watersheds