PROJECT IDENTIFICATION
TOWN OF DAYTON
COOKS CREEK BANK STABILIZATION – CARGILL/PITMAN FACILITY FRONTAGE

Location Description
38.41159, -78.93785
Cooks Creek along the Pitman Family Farms (previously Cargill) food processing facility on the east side of Dayton.

Project Issue
Riverine flooding risk to critical economic infrastructure and active stream bank erosion. The Pitman facility serves as the town's primary employer and tax revenue source. A flood-related shutdown of the facility would be financially devastating for the town. Cooks Creek is actively eroding the facility's parking lot (**Figure 1**) and the administrative parking lot (**Figure 2**) flooded in 2025 during a major flash flood event.

Project Purpose
Stabilize Cooks Creek banks along the Pitman frontage to slow active erosion and reduce flood inundation extent at the facility's parking lot.

Identified Constraints
a. Work requires facility cooperation and formal access or easement agreements
b. Facility operations may restrict access timing and construction activity near the processing plant
c. Project area restricted by adjacent property unless adjacent landowner cooperation can be acquired

Additional Information Needed
a. Presence of utilities
b. Evaluate erosion extent and rate
c. Assess extent of prior stabilization work (riprap apparent in aerial imagery downstream)
d. Possibility of easement onto adjacent property(ies) to expand design alternatives
e. Evaluate stormwater volume/velocity reduction possibilities within Pitman site
f. Assess what improvements are feasible with and without Pitman cooperation
g. FEMA flood model data for State Route 290 and State Route 42 crossings

Project Proposal and Planning-Level Cost Estimate
If the project scope were narrowed to simply addressing the erosion along the northern parking lot, simply installing stone toe protection and streambank plantings (e.g. live stakes) to establish

vegetative bank stabilization would likely be sufficient. However, to accomplish any tangible reduction in flood impact, a full stream restoration to enhance floodplain connectivity and with it establish additional flood water storage would be recommended (**Figure 3**). This would involve modifying the plan and profile of the stream in the vicinity of the facility to establish more natural sinuosity while moving the channel further away from the facility. Floodplain connectivity would also be prioritized, likely with a low inset floodplain bench to add capacity for higher flows to be conveyed without impacting the facility. Floodplain modifications should be paired with re-establishment of a vegetated riparian buffer up to 100 feet on either side where possible.



Figure 1. Failing fenceline along northeastern bound of Pitman lot, Cooks Creek immediately past fence.



Figure 2. Proximity of Cooks Creek (visible at right) to Pitman southeastern parking lot

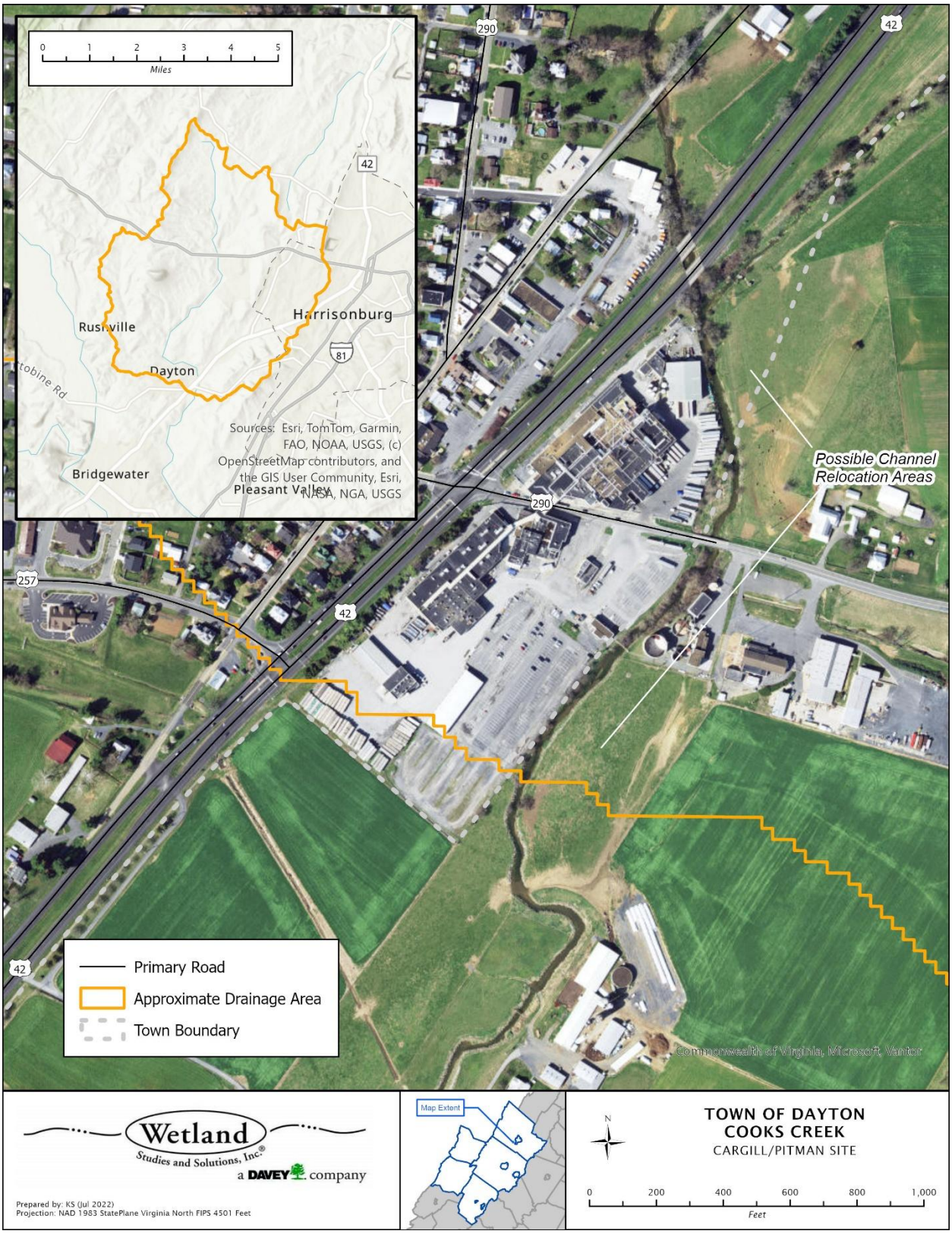

Figure 3. Cooks Creek along Pitman site location and watershed.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Survey and Design					**$225,000**
Construction Administration and Oversight					**$40,000**
Access and ESC					**$33,500**
Construction					**$500,000**
Stakeout and As-Built	1	LS	$36,000	$36,000	
Mobilization	1	LS	$25,000	$25,000	
Excavation and Hauling	1500	CY	$50	$75,000	
Grading	8	AC	$8,000	$64,000	
Reinforced Bed Mix	1200	TN	$100	$120,000	
Cross Vane	4	EA	$45,000	$180,000	
Planting					**$205,900**
Native Seed and Natural Fiber Matting	500	SY	$12	$6,000	
Riparian Buffer Seed and Straw	1300	SY	$3	$3,900	
Live Stakes	3600	EA	$10	$36,000	
Tubelings	20000	EA	$8	$160,000	
Contingency (30%)					**$301,320**
TOTAL ESTIMATED BUDGET					**$1,305,720**

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 Cooks Creek.

Possible Alternatives and Additional Considerations

Stone toes visible in aerial imagery at and downstream of target area, confirmed on Pitman site during site visit, which would indicate erosion is a concern for adjacent landowners. This could be an opportunity to increase the scale and impact of potential work to benefit more than one property and increase benefits to each involved via reduced erosion and increased floodplain capacity. There is potential to develop additional floodplain storage upstream as well if an agreement with landowner(s) can be reached.

This site is the most downstream in a series of locations identified by the Town along Cooks Creek that may be more effective when addressed as a combined project rather than separately.

<u>TMDL/MS4 Considerations</u>

The watershed drains to Cooks Creek, which has a benthic impairment and TMDLs established for sediment, phosphorus, and bacteria. Rockingham County became an MS4 permittee in 2025, projects impacting TMDL pollutants may also help in attaining permit goals and encouraging

partnership in pursuing projects. Additionally, the area is in 2020 Census Urbanized Area, so it is possible VDOT would be interested in partnering for credits.

Assumptions

Watershed (via StreamStats 6/1/2026) is 17.5 square miles.

1,800 linear feet of stream restoration estimated. Stream bed material assumed to be largely salvaged from on-site, and excess fill used to fill the abandoned channel length. No costs calculated for easements or property acquisition.

Recommended Next Steps

Begin outreach to Pitman and surrounding landowners to gauge interest and reach out to Rockingham County for potential partnership opportunity.

References

USGS. StreamStats v4.33.0. Accessed online 1 June 2026.

JMU and 3e Consulting. 2019. Revision of the Benthic TMDL Total Maximum Daily Load (TMDL) Developed for the Blacks Run and Cooks Creek Watershed Located in City of Harrisonburg and Rockingham County.

PROJECT IDENTIFICATION

TOWN OF DAYTON

COOKS CREEK FLOOD MITIGATION NEAR MEIGS LANE BRIDGE

Location Description

38.42506, -78.92299

Meigs Lane crossing of Cooks Creek tributary in the northern portion of Dayton's boundary. Cooks Creek runs immediately behind the building with a VDOT bridge on Meigs Lane crossing the creek behind the Valley Meat Processors facility (**Figure 1**).

Project Issue

Riverine flooding risk to private commercial building in the FEMA floodplain immediately adjacent to Cooks Creek tributary.

Project Purpose

Assess Cooks Creek channel condition and flood exposure at the Valley Meat Processors site and determine whether any town-side creek improvements could meaningfully reduce flood risk and document the practical limits of public-side mitigation at this location.

Identified Constraints

a. Probability of land acquisition and/or easements necessary
b. Infrastructure
c. VDOT involvement

Additional Information Needed

a. Presence of utilities
b. Survey of channel and bridge

Project Proposal and Planning-Level Cost Estimate

Evaluating the capacity of the existing channel and bridge crossing will inform whether there is a capacity issue compared to VDOT standard design (50-year or 25-year return period depending on the actual road classification) and will provide modeled flood impacts. If possible, a comparison to known historic storm events and a calculation of their estimated return period should be performed to determine if the flooding exceeded the design capacity of the bridge. The private structure is within the FEMA SFHA Zone AE (1% annual chance). Depending on the results of the bridge and channel evaluations, the Town can elect to support the business in either instituting floodproofing measures or relocating out of the floodplain. An H&H study for the area may identify additional properties impacted and highlight potential solutions benefitting multiple buildings.

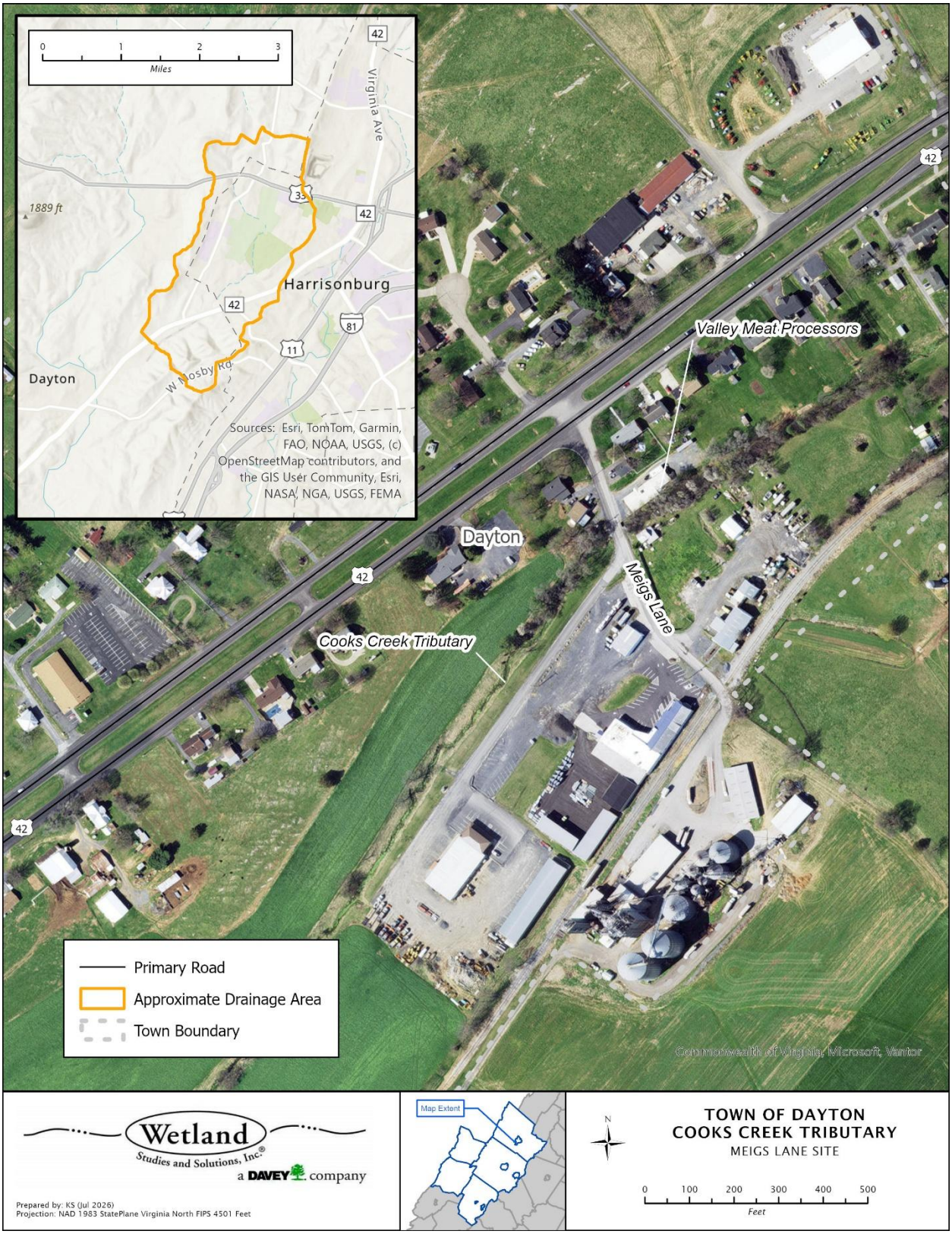

Figure 1. Location and drainage area map of Cooks Creek Tributary at Meigs Lane (stream flowing from north to south).

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Flood Impact Study					**$55,000.00**
Existing Conditions Survey	1	LS	$25,000.00	$25,000.00	
H&H Study	1	LS	$30,000.00	$30,000.00	
Contingency (30%)					**$16,500.00**
TOTAL ESTIMATED BUDGET					**$71,500.00**

Possible Alternatives and Additional Considerations

This site is one of a series of locations identified by the Town along Cooks Creek that may be more effective when addressed as a combined project rather than separately.

TMDL/MS4 Considerations

The watershed drains to Cooks Creek, which has a benthic impairment and TMDLs established for sediment, phosphorus, and bacteria. Rockingham County became an MS4 permittee in 2025, and so there may be permit-related benefit to projects impacting TMDL-pollutants, as an aspect to consider into the future. Additionally, the area is in 2020 Census Urbanized Area, so it is possible VDOT would be interested in partnering for credits.

Assumptions

Watershed (via StreamStats 6/12/2026) is 3.94 square miles (2,520 acres).

Recommended Next Steps

Reach out to VDOT regarding design documentation for the existing bridge to determine if this is a known constriction to inform need for updated H&H study.

References

USGS. StreamStats v4.33.0. Accessed online 1 June 2026.

PROJECT IDENTIFICATION

TOWN OF DAYTON

COOKS CREEK FLOOD MITIGATION ALONG STATE ROUTE 42 — VALLEY WATER GARDENS AREA

Location Description

38.4189, -78.93194

Cooks Creek tributary floodplain north of downtown Dayton along Route 42, in the area of Valley Water Gardens, Hair Corral, Grammy's Ice Cream, and Harvest Table complex. The Town notes there is a large existing floodgate (~40 ft) along the creek corridor, and the Town's new water tank and 16-inch waterline creek boring are under construction nearby.

Project Issue

Riverine floodplain overflow during major flash flood events — Cooks Creek tributary overflows into a low-lying natural depression along this corridor during significant events, filling a natural floodplain detention area before flooding southward into the Valley Water Gardens low point; during one past major event a box truck at Valley Water Gardens was lifted and displaced by floodwater; corridor stays persistently wet/soft in normal conditions but does not flood structures routinely

Project Purpose

Assess flood exposure at the Valley Water Gardens low point and evaluate whether any channel or floodplain improvements on the Town's side could reduce flooding frequency or depth during major flash flood events without eliminating the natural floodplain storage function of the low-lying depression.

Identified Constraints

a. Probability of land acquisition and/or easements necessary
b. Infrastructure
c. Rockingham County involvement

Additional Information Needed

a. Presence of utilities
b. Details on floodgate/wall

Project Proposal and Planning-Level Cost Estimate

Evaluating the capacity of the existing culvert crossing (**Figure 1**) and efficacy of the floodwall (**Figure 2**) will be necessary to evaluate the extent of the flooding issue and feasible solutions. It is possible that the dual-culvert crossing at Valley Water Gardens or other structures in the area

are contributing to an increased flood risk. Channel flow capacity at these cross sections and culvert crossings needs to be analyzed to determine problem areas. The overall area is a pinch-point for the channel floodplain as it flows southwest and is all within the FEMA SFHA Zone AE (1% annual chance). Aside from possible capacity changes at the culvert, a floodplain restoration project upstream of the site of concern could increase the flood attenuation (**Figure 3**). The area upstream of the site is outside of the Town boundary, thus under Rockingham County jurisdiction.



Figure 1. Dual-culvert crossing at entrance to Valley Water Gardens (image from Google Streetview).



Figure 2. Concrete barrier floodwall located along the northeastern boundary of the site parking lot (image from Google Streetview).

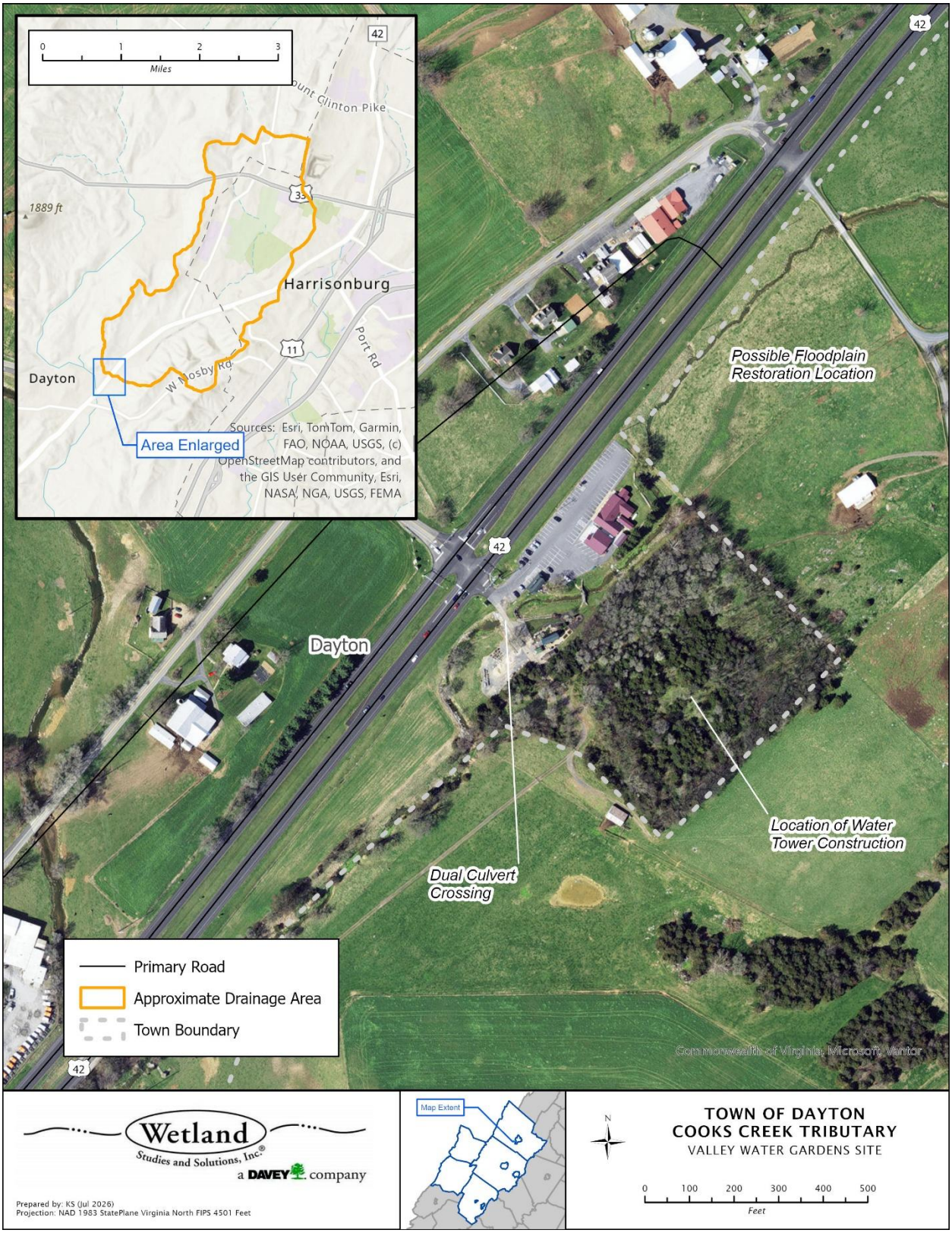

Figure 3. Location and watershed map of Valley Water Gardens site along Cooks Creek tributary (stream flow north to south).

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Flood Impact Study					**$55,000.00**
Existing Conditions Survey	1	LS	$25,000.00	$25,000.00	
H&H Study	1	LS	$30,000.00	$30,000.00	
Contingency (30%)					**$16,500.00**
TOTAL ESTIMATED BUDGET					**$71,500.00**

Estimation of costs associated with construction-phase efforts will require additional study and scoping.

Possible Alternatives and Additional Considerations

This site is the one of a series of locations identified by the Town along Cooks Creek that may be more effective when addressed as a combined project rather than separately.

TMDL/MS4 Considerations

The watershed drains to Cooks Creek, which has a benthic impairment and TMDLs established for sediment, phosphorus, and bacteria. Rockingham County became an MS4 permittee in 2025, and so there may be permit-related benefit to projects impacting TMDL-pollutants. Additionally, the area is in 2020 Census Urbanized Area, so it is possible VDOT would be interested in partnering for credits.

Assumptions

Watershed (via StreamStats 6/12/2026) is 4.61 square miles (2,950 ac).

Recommended Next Steps

Begin outreach to businesses and surrounding landowners to gauge interest. Identify the structure and design of noted flood wall and whether an additional flood gate is present as well. Reach out to Rockingham County for potential partnership opportunity.

References

USGS. StreamStats v4.33.0. Accessed online 12 June 2026.

PROJECT IDENTIFICATION

TOWN OF DAYTON

DOWNTOWN STORMWATER SYSTEM — THOMPSON STREET, CHERRY LANE, TUNNEL ALLEY, AND STATE ROUTE 42 OUTFALL

Location Description

38.41466, -78.93982

Downtown stormwater drainage system serving a natural topographic bowl in central Dayton. The system collects runoff from Cherry Lane and Thompson Street drop inlets, and funnels to a pump vault on private property in the alley behind Main Street. Collected runoff is pumped through Tunnel Alley up to the VDOT drainage system, where it is conveyed under State Route 42 to discharge on the east side of State Route 42 near the Pitman Family Farms (previously Cargill) facility. Pumps were installed in the pump vault sometime in the 1980's. (The area between Main Street and State Route 42 is largely captured by a separate stormwater system and conveyed in the same ditch system across State Route 42) (**Figure 1**)

Project Issue

Stormwater system capacity — aging, undersized downtown collection and conveyance system is at or beyond capacity during moderate-to-heavy rain events, flooding the alley and surrounding low area. The Downtown area floods a couple of times per year under normal conditions and was overwhelmed entirely during last year's (2025) flash flood.

Project Purpose

Increase downtown stormwater system capacity to reduce recurring flooding of the low-lying alley and collection area behind Main Street businesses during moderate-to-heavy rain events.

Identified Constraints

a. Land acquisition and/or easements necessary (Town has an easement on the site of the pump vault, but does not own the property)
b. Existing infrastructure (water, sewer, stormwater, buildings)
c. Pump vault is on private property
d. VDOT coordination – presumed responsible for culvert under State Route 42 and adjacent ditches
e. Potential karst (noted by Town)

Additional Information Needed

a. Presence and locations of utilities
b. Sizing information for pump vault and equipment
c. Survey of existing stormwater infrastructure

d. Presence of easements for Town operations
e. VDOT's assumed discharge from pump system

Project Proposal and Planning-Level Cost Estimate

A full survey of the existing infrastructure and analysis of the capacity of the existing pump system is necessary to establish the magnitude of the issue and the possible options to address the recurring flooding. Buildup of debris within the system has not been addressed or evaluated recently and should be a first step if noted.

Noted during a site visit (6/15/2026), the ditch on the south side of State Route 42, along the Pitman property, does not have positive drainage northeast to Cooks Creek and regularly needs to be cleaned out manually by Town staff. Addressing this downstream constraint should be part of the overall project, but will require coordination with VDOT which is the presumed responsible party.

Increasing the pump vault capacity, upgrading the pumps themselves, and adding necessary redundancy are the most straightforward methods of addressing flooding in the area. Coordination with VDOT regarding potential increase in pumped discharge through the culverts under State Route 42 should occur. Pursuing this should also include documentation of the plan of action during a flood event to ensure Town staff have all the information they need in an emergency.



Figure 1. Approximate drainage area (est. 28.5 acres) to pump vault used to address flooding in downtown Dayton.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Survey and Design					**$180,000**
Construction Administration and Oversight					**$35,000**
Pump Upgrade Access and Erosion/Sediment Control					**$51,580**
Pump Upgrade Construction					**$748,800**
Stakeout	1	LS	$18,000	$18,000	
As-Built Survey	1	LS	$18,000	$18,000	
Mobilization	1	LS	$30,000	$30,000	
Excavation and Hauling	700	CY	$70	$49,000	
Grading	0.1	AC	$9,000	$900	
Pump System	1	EA	$200,000	$200,000	
Pump Vault	1	EA	$50,000	$50,000	
Storm Sewer Pipe	500	LF	$300	$150,000	
Utility Relocation	1	EA	$150,000	$150,000	
Inlet Replacements	3	EA	$10,000	$30,000	
Curb & Gutter Replacement	60	LF	$50	$3,000	
Concrete Sidewalk Replacement	60	SQ YD	$80	$4,800	
Pavement Replacement	500	SQ YD	$80	$40,000	
Mill and Overlay	200	SQ YD	$25	$5,000	
Striping	50	LF	$2	$100	
Pitman Ditch Access and Erosion/Sediment Control					**$4,280**
Pitman Ditch Construction					**$11,300**
Ditch Excavation	320	LF	$30	$9,600	
Permanent Seeding	10	LB	$10	$100	
Erosion Control Matting	800	SY	$2	$1,600	
Contingency (30%)					**$309,288**
TOTAL ESTIMATED BUDGET					**$1,340,248**

The table above presents estimated costs for the design and installation of a new vault and pump system and necessary replacement of impacted pavement, etc. Estimate for survey and design includes H&H study to determine the capacity and capability of the existing and designed systems. Estimate for access and erosion and sediment controls includes a set-aside for traffic control during construction. VDOT is assumed the responsible party for the Pitman ditch, which may transfer some of those costs to them.

Possible Alternatives and Additional Considerations

An alternative that could be explored, which would require significant additional coordination with the Harrisonburg-Rockingham Regional Sewer Authority, would be establishing a connection to the nearby HRRSA line for use in flood events to receive excess stormwater.

Previous work along Mill Street separated that portion of the Town into a separate drainage path directing stormwater northeast directly to Cooks Creek. A portion of Thompson Street could feasibly be redirected similarly to the south, which would decrease the area draining to the pump vault, but the distance to reach an existing channel routing around the Pitman (previously Cargill) plant may be overly restrictive.

Residents in the area can be encouraged to install residential-scale stormwater management practices to enhance the flooding reduction efforts, such as rain gardens (micro-bioretention) and rain barrels.

TMDL/MS4 Considerations

The watershed drains to Cooks Creek, which has a benthic impairment and TMDLs established for sediment, phosphorus, and bacteria. Rockingham County became an MS4 permittee in 2025, which is an aspect to consider into the future. However, pump and storm sewer line upgrades are unlikely to generate pollutant reduction credits.

Assumptions

Drainage area to the pump vault is estimated at 28.5 acres.
Approximately 500 linear feet of storm sewer pipe to be replaced in the pump system upgrade and 320 linear feet of open ditch to be re-graded between State Route 42 and the Pitman facility to re-establish positive drainage to Cooks Creek.

Recommended Next Steps

Begin outreach to VDOT and Pitman regarding work on the downstream ditch. Evaluate funding options.

References

JMU and 3e Consulting. 2019. Revision of the Benthic TMDL Total Maximum Daily Load (TMDL) Developed for the Blacks Run and Cooks Creek Watershed Located in City of Harrisonburg and Rockingham County.

PROJECT IDENTIFICATION

TOWN OF DAYTON

WESTVIEW/ASHBY BACKYARD STORMWATER DRAINAGE SYSTEM ASSESSMENT AND REPAIR

Location Description

38.4173135, -78.9461768

Backyard stormwater drainage system in the block between Mill Street and Turner Street, bordered by Westview Street and Ashby Street; town holds easements for infrastructure running through private backyards

Project Issue

Failing stormwater drainage infrastructure — town-installed shallow corrugated plastic pipe and grated drop inlets through private backyards have degraded; pipe tops visible at or above ground level during mowing, suggesting insufficient burial depth (**Figure 1**). Town staff report recurring pooling and drainage complaints from residents.

Project Purpose

Assess condition and function of the backyard drainage system and identify repair or replacement options to restore adequate stormwater drainage for the Westview/Ashby residential block

Identified Constraints

a. Infrastructure runs through private backyards, requiring access coordination with multiple private property owners
b. Surrounding structures and infrastructure

Additional Information Needed

a. Presence and location of utilities
b. Presence and extent of easements

Project Proposal and Planning-Level Cost Estimate

As a replacement to the failing corrugated pipe drainage system, a dry vegetated swale could be implemented to absorb and infiltrate much of the stormwater flowing to this area while also providing sediment removal and nutrient uptake and improving overall water quality (see TMDL note in Additional Considerations). An underdrain system would convey excess stormwater into the existing stormwater system (**Figure 2**).



Figure 1. Existing drainage system highlighted running from top to bottom with small drop inlet visible in foreground. Photo taken from Turner Street near Westview Street facing southeast.



Figure 2. Stormwater drop inlet on southeast corner of Turner Street and Westview Street that upgraded system could join.

ITEM/DESCRIPTION	QTY	UNIT	UNIT COST	ITEM SUB-TOTAL	EXTENDED SUB-TOTAL
Survey and Design					**$38,000**
Construction Administration and Oversight					**$35,000**
Access and Erosion/Sediment Control					**$9,200**
Vegetated Dry Swale					**$96,200**
Stakeout and As-Built Surveys	1	LS	$20,000	$20,000	
Mobilization	1	LS	$6,000	$6,000	
Excavation and Hauling	180	CY	$65	$11,700	
Vegetated Swale	180	CY	$300	$54,000	
Underdrain Pipe	500	LF	$3	$1,500	
Permanent Seeding and Straw	1000	SY	$3	$3,000	
Contingency (30%)					**$53,520**
TOTAL ESTIMATED BUDGET					**$231,920**

The table above presents estimated costs associated with the design and installation of a vegetated dry swale to replace a portion of the existing, failing drainage system.

Possible Alternatives and Additional Considerations

Replacement of the failing stormwater system with traditional stormwater infrastructure is estimated to be of a similar cost, but would not qualify for the same level of funding through the Community Flood Preparedness Fund as the proposed green infrastructure solution. Stormwater BMPs such as dry swales provide pollutant load reductions which make them eligible for funding opportunities through DEQ's Stormwater Local Assistance Fund. Residents in the area can also be encouraged to install residential-scale stormwater management practices to enhance the flood reduction efforts, such as rain gardens (micro-bioretention) and rain barrels. The Shenandoah Valley Soil and Water Conservation District (SVSWCD) administers the Virginia Conservation Assistance Program (VCAP), which can be another source of funding for residential projects.

<u>TMDL/MS4 Considerations</u>

The watershed drains to Cooks Creek, which has a benthic impairment and TMDLs established for sediment, phosphorus, and bacteria. Rockingham County became an MS4 permittee in 2025, so there may be permit-related benefit to projects impacting TMDL-pollutants. This could also open up additional potential funding sources related to TMDL goals.

Assumptions

Existing stormwater system assumed to be of adequate capacity.

Recommended Next Steps

Evaluate the extent and limitations of existing drainage easements. Begin outreach to impacted landowners to gauge interest.