

MEMORANDUM

TO: BILL MECHNICK, PLA

FROM: LYNETTE WUENSCH, P.E., CFM, RS

ORGANIZATION: LPDA

DATE: AUGUST 30, 2023

PHONE NUMBER:

SENDER'S REFERENCE NUMBER:

RE: EVAN SPRINGS FIELD VISIT/STORMWATER CONSIDERATIONS

YOUR REFERENCE NUMBER:

URGENT FOR YOUR USE PLEASE COMMENT PLEASE REPLY PLEASE RECYCLE

EPR is looking at the stormwater layout and how to best incorporate the design into potential proposed site development at Evan Springs. This property is located to the southwest of I-581, east of Fairland Rd NW, North of Cove/Andrews, and west of 19th. The property is located in the Glade Creek-Tinker Creek Watershed. The purpose of this memorandum is to document conditions observed in a recent field review and a discussion that occurred with a City representative who was present for the field review.

The headwaters of Lick Run begin in Roanoke County and proceeds from northwest to southeast along the I-581 corridor. This watershed drains 3,747 acres of 35% impervious land including the Roanoke Regional Airport, Valley View Mall, Evans Spring, and then terminating at the confluence with Trout Run in downtown Roanoke.

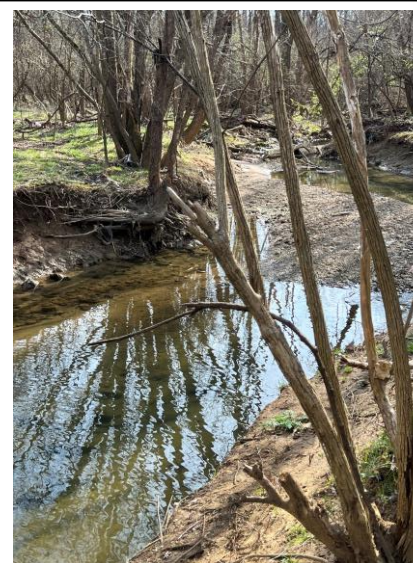
When looking at the existing site and preparing a concept for build-out it is important to look at the existing conditions of Lick Run as well as the existing pond/wetland. Lick Run is currently not a stable stream through the property and needs to be cleared from trash and debris. The channel also needs to be reshaped to create a stable stream using natural channel design.



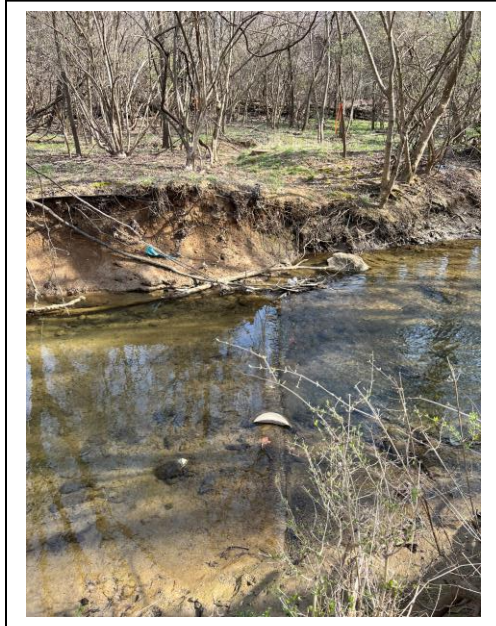
The channel has become blocked with debris (trees and trash)



Eroded slopes along the banks.



Bars (gravel particles) have formed in the middle of the channel where the velocity decreases.

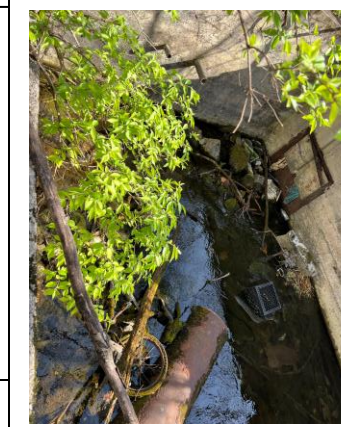


The existing channel has significant eroding of the banks and the channel in some areas has deepened and widened. Tree roots are exposed, and the incising stream channel has become disconnected from its floodplain. In addition, sewer pipe has become exposed. It is recommended that the incised stream channel cross section is re-graded to a more gentle angle to accommodate plantings, improve bank stability and reconnect the stream to its floodplain. In addition, sediment has built up in the stream over time and will need to be removed to restore the natural state of the stream. These measures will improve water quality and provide healthy habitats. If left untouched, and development is built around the existing stream and floodway, the widening stream may cause property damage to nearby homes and infrastructure and pose a risk to public safety.

I met with Marcus Aguilar with the City of Roanoke onsite February 22, 2023, to discuss the existing conditions of Lick Run through this development. He agreed with the conditions of the channel and stated that the City would be open to a stream restoration project on this property. This would require a partnership with the developer. The cost of the stream restoration could be a revenue share project between DEQ and the City of Roanoke. The developer could share some of the cost/provide an easement over Lick Run. This would be an option for improving the area and reclaiming some of the floodplain for development. It was suggested that a greenway at the top of the floodplain could be an amenity to the proposed development.

In addition to the stream restoration project, the City is currently looking at the City owned 13-acre regional detention pond that is located on the north side of the property. This existing detention pond has the capacity to reduce peak flow during storm events but does not reduce the total volume of runoff due to no infiltrative capacity. The lack of infiltration leads to channel erosion as a result of longer duration of high stream flow velocities. This pond is in need of updating and the City is open to discussions on working together with the site developer to provide an improved design that could benefit future development of the Evans Spring site.

The existing wetland (Evan Spring – Freshwater Emergent Wetland) on site will need to be identified and delineated by the U.S. Army Corps of Engineers. This wetland has an existing structure that will need to be repaired as well.



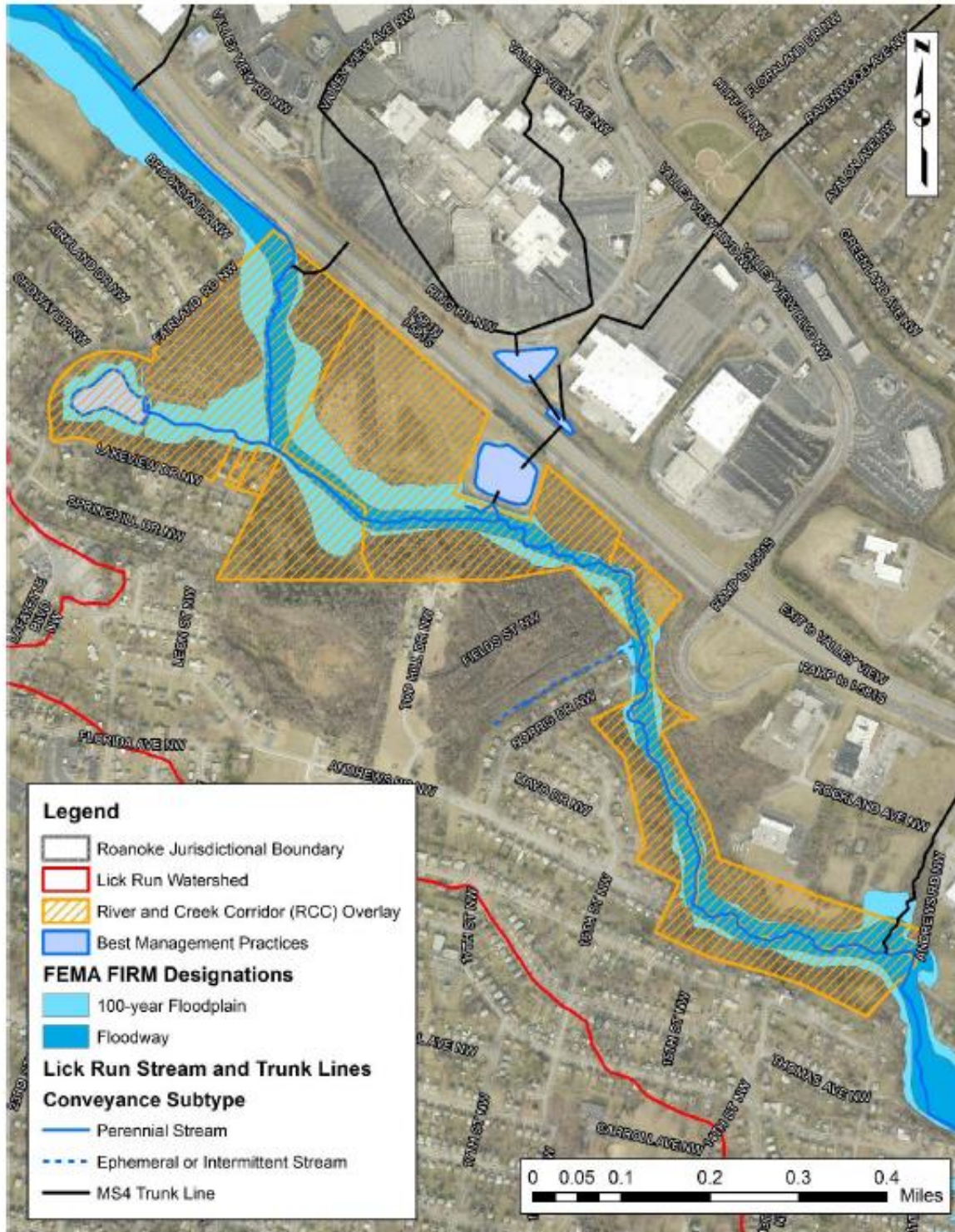


Figure 3.19 - Map depicting the River and Creek Corridors Overlay in Lick Run with the 100-year floodplain delineation. Stream features shown are based on field survey in 2015 (see Section 3.2.4).

The proposed development will meet the MS4 and Virginia Runoff Reduction Method (VRRM), aiming to minimize the impervious area and provide stormwater measures that will disconnect the impervious area. In addition, the proposed system will be designed to mitigate increase in runoff leaving the property due to the increased roof/impervious areas. When possible, environmental sensitive site design and LID techniques will be used in the planning of the project. No construction will take place within the wetland resource area or within the buffer zones to the resource areas. Permitting and coordination will be required with the City of Roanoke, Army Corps of Engineers, FEMA, DEQ and DCR.

The future development project should include a range of BMPs to manage stormwater generated from the development such as permeable pavement, detention areas, forebays, rain gardens, infiltration strips, bioretention swales, and level spreaders. These controls will need to be designed in accordance with the Virginia Stormwater BMP Clearinghouse.

The development should incorporate pollution prevention measures like providing narrow travel lanes which will result in a significant reduction of land coverage and allowing more vegetation to absorb runoff and to filter impurities from the runoff. The residential units should also be considered when reducing the impervious areas and consider ideas such as including contract strips into the driveway designs. Balancing multimodal accessibility with environmental impacts, the streets could potentially be designed to have sidewalks on only one side to further reduced the amount of paving. Reductions in impervious surface should also be considered with design of the geometry of the parking lots.

As previously mentioned, the existing regional detention pond that serves the Valley View Mall and surrounding commercial areas is a stormwater improvement that should be incorporated in the Evan Springs redevelopment project. This pond can be modified in place with a new outlet structure allowing for extended storage and/or a site-specific soil analysis completed to determine if the pond could be retrofitted to provide infiltration. In addition, a pretreatment forebay and outfall level spreader should be installed. A flowing park could also be installed as the level spreader which would allow the area to be used as a neighborhood park adjacent to the upland buffer. Another option may be to relocate the facility to a different location to better address the stormwater needs of the development in combination with the offsite contributing area.

The streambanks should be restored along the on-site channel, and waterways should have natural landscaping and vegetation creating a natural filtration of stormwater flowing into the existing channel/Lick Run. Green fingers of land between structures should be used for filtering runoff. Retention hollows can be incorporated into the neighborhoods to store runoff in a natural setting. Open swales and use of natural drainage ways can combine with the preservation of mature vegetation to provide stormwater management in areas that lack structures. Additionally, small pockets of vegetation in medians and street islands will serve as rain gardens allowing for the development's underground piping system as well as curbs and gutters to be downsized lessening the environmental impact of the development. The introduction of the rain gardens will remove a greater amount of pollutants from runoff and serve as a pretreatment before ultimately discharging to Lick Run. Landscaped and grated tree wells along the streets will provide locations for shade trees as well as

stormwater storage. When impervious surfaces are unavoidable, stormwater measures like permeable pavers will be evaluated to help reduce storm drain runoff.

The pretreatment devices will outfall to constructed stormwater retention basins located throughout the development, in order to help improve water quality and will have outlets of different types to allow outflow during occurrences of storms. These outflows will be designed to meet the flood protection and channel protection requirements preventing erosive flow. The retention basins can be incorporated into the landscape as a water feature.

Filtration of stormwater to remove pollutants before release to the onsite channel is very important for the Lick Run watershed. The proposed treatment trains will reduce the necessity for a lot of the site disturbance and reduce the size of the underground systems, stormwater volume and pollutant loading.

END OF MEMORANDUM