SR 2039, Section 09S Landslide Repairs along Mill Creek
Eldred and Loyalsock Townships, Lycoming County, Pennsylvania

PROJECT DESCRIPTION

This project consists of the remediation of two landslides and the relocation and restoration of Mill Creek along SR 2039 in Eldred and Loyalsock Townships, Lycoming County. Multiple landslides occurred in 2019 along SR 2039 (Warrensville Road) at the project site. The resulting landslides have created an unstable and unsafe condition to the traveling public along the SR 2039 roadway. SR 2039 has been closed to traffic at the site since the slides occurred due to unsafe conditions. The project site is located approximately 2.3 miles south of the town of Warrensville and the intersection of SR 2039 with SR 973. The project is approximately 2.8 miles north of the intersection of SR 2039 and SR 2018 (Four Mile Drive). The project site is located on the USGS quadrangle maps of Montoursville North, PA at latitude 41°17'46" and longitude -76°56'09".

The permanent repairs will consist of rock embankment material placed to reconstruct and stabilize the roadway and the channel bank of Mill Creek. Additionally, rock embankment will be placed along Mill Creek at the toe of the slope to repair undercutting of the existing embankment. The rock embankment will be constructed of R-8 rock for the lower portion of the slope with Durable Rock above. Four (4) existing pipes under SR 2039 and their subsequent outfalls along the embankment (draining to Mill Creek) will be replaced as part of the proposed project (Outfall 1 through 4). The outfalls are outside of the regulated floodway of Mill Creek.

The stream channel has migrated closer to SR 2039 over time resulting in the unstable embankment and the eventual landslide. The project will reconstruct the roadway embankment at the location of the failures and unstable embankment and relocate the channel to the toe of the proposed rock embankments. Stream stabilization and habitat measures, consisting of four (4) multi-log vanes (with grade control), six (6) log deflectors, rootwads (approximately 70, but potentially more depending on the diameter of trees available), and random boulder placement (approximately 50, distributed along the entire restoration reach), will be installed along the length of the project. Restorative and replacement plantings are proposed along the entire reach of stream and along the adjacent floodplain and riparian areas.

The stream channel will be relocated in the area of the slide repair and stream restoration to tie into the bottom of the rock slope along the left bank. The typical proposed channel section will have a 30-foot wide flat bottom, with a left bank graded at a 2:1 slope (H:V), rising to approximately the bankfull elevation and a 10-foot wide minimum bench at the bottom of the proposed rock slope. The right side channel bank consists of a 2:1 channel bank up to the bankfull elevation with a 12:1 elevated floodplain above the top of bank. Where there is an existing point bar on the inside of the bend in the channel near the upstream slide, the point bar will be removed and graded at 12:1 for a width of 30 feet as opposed to constructing a 2:1 channel bank on the right side of the channel.

During construction, a temporary access road will be constructed off SR 2031 (Lick Run Road), forming a loop that follows the project along Mill Creek and the edge of the agricultural field with 2 crossings of Mill Creek and 1 crossing of Lick Run. A temporary diversion barrier will be placed in the channel in both phases of construction for dewatering purposes. A concrete glare screen section with sandbags is assumed for the diversion barrier in the temporary conditions hydraulic analysis.

The proposed stream restoration, relocation and in-stream structures are designed for bankfull flow and evaluated for high flows consisting of the 25-year and 100-year flows in order to avoid increases to high flow elevations. The analysis shows that the proposed design will not result in any 100-year water surface elevation increases.

Mill Creek is a continuously flowing tributary to Loyalsock Creek and is listed in the Pennsylvania Code (PA Code), Title 25, Chapter 93 with an aquatic life classification of Trout Stocked Fishery (TSF) and Migratory Fishery (MF). Mill Creek is listed by the Pennsylvania Fish & Boat Commission (PAFBC) as approved trout stocked waters and a naturally reproducing trout stream at a location that is 1.5 miles upstream of the site. Mill Creek is not listed as approved trout stocked waters, a naturally reproducing trout stream or a Class A Wild Trout stream near the project location. Lick Run has an aquatic life classification of High Quality, Cold Water Fishery (HQ-CWF) and an existing use classification of Exception Value (EV) and MF. Lick Run is also listed as a naturally reproducing wild trout stream. It is anticipated that there will be an in-stream construction restriction for Lick Run from October 1st to December 31st. It is not anticipated that any in-stream restrictions will be required for Mill Creek.

Seven (7) wetland areas were identified in the project area, Wetlands A, C, E, F, G, H, and I. Permanent channel and wetland impact for the project include impacts from the proposed embankment repair and stream restoration project. Impacts to the channel, floodway, and wetlands as part of the project include the following (LxW).

Facility/Activity	Channel Impact		Floodway Impact		Wetland Impact	
	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
Mill Creek						
JPA-1-1: Stream Restoration, In-stream Structures & Channel Modification	1275’ x 30’	---	---	---	---	---
JPA-1-2: Other, U/S Temp Crossing, Temp Diversion Dike	---	1350’ x 29’	---	---	---	---
JPA-1-3: Other, D/S Temporary Crossing	---	164’ x 22’	---	---	---	---
JPA-1-4: Permanent Floodway Impact	---	---	R: 1037’ x 11’ L: 933’ x 40’	---	---	---
JPA-1-5: Temporary Floodway Impact	---	---	---	R: 688’ x 28’ L: 1257’ x 15’	---	---
JPA-1-6: Outfall 1 (Sta. 584+51)	---	---	---	---	---	---
JPA-1-7: Outfall 2 (Sta. 586+37)	---	---	---	---	---	---
JPA-1-8: Outfall 3 (Sta. 590+36)	---	---	---	---	---	---
JPA-1-9: Outfall 4 (Sta. 591+53)	---	---	---	---	---	---

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Lick Run						
JPA-1-10: Temporary Access Road Crossing	---	83’ x 8’	---	---	---	---
JPA-1-11: Temporary Floodway Impact	---	---	---	R: 33’ x 50’ L: 50’ x 50’	---	---
Wetland A (PEM)						
JPA-1-12: Temporary Wetland Impact	---	---	---	---	---	0.013 ac.
Wetland C & I (PFO)						
JPA-1-13: Temporary Wetland Impact (No trees removed)	---	---	---	---	---	0.023 ac.
Wetland G & H (PFO)						
JPA-1-14: Permanent Wetland Impact	---	---	---	---	0.046 ac.	---