

Scene 50 · MS4 Assessment

Black Branch 2

City of Lebanon TN

36.16882, -86.27211 · Generated October 22, 2026

OVERALL SCORE

3.6

Poor



Front: Looking downstream into a concrete box culvert that carries the stream under a road embankment. The culvert is a cast-in-place concrete structure with visible header beam and wingwalls. Water is flowing through the culvert with turbid brown color. The road embankment above is covered with dormant grass and some green growth.

Right: Looking at the right bank (right when facing downstream) showing the side of the concrete box culvert structure with its wingwall extending along the bank. The concrete wall is weathered with some moss growth. Above the culvert, the road embankment rises with dormant grass and bare deciduous trees. Overhead electric utility lines cross the scene. Beyond the culvert, residential properties and vehicles are visible in the distance.

Back: Looking upstream from the culvert entrance showing a small stream channel flowing through a rural agricultural landscape. The stream has turbid brown water with a sand/silt bed visible beneath. Banks are low to moderate with sparse dormant vegetation, bare deciduous trees, and some brush. A white building/barn is visible on the left bank side. Open agricultural fields extend to the right. The riparian buffer is narrow with only scattered trees.

Left: Looking to the left bank (left when facing downstream) showing an open agricultural field with dormant grass/pasture extending to the horizon. A utility pole with power lines stands near the bank edge. The bank is eroding with exposed soil and roots. A piece of litter (appears to be a plastic bag or similar) is visible in the water. A concrete block or remnant is visible near the base of the utility pole. A red barn is visible in the far distance across the field.

Assessment Scores

Component	Score	Visual	Rating
Channel Condition	3		marginal
Hydrologic Alteration	4		Fair
Sediment Deposition	3		Poor
Left Bank Stability	3		Poor
Right Bank Stability	4		Fair
Left Vegetative Protection	3		Poor
Right Vegetative Protection	4		Fair
Riparian Canopy Cover	2		Poor
Floodplain Vegetation	2		Poor
Water Appearance	3		Poor
Nutrient Enrichment	7		Good
Epifaunal Substrate	-		-

Urgency: MEDIUM TERM 6 12 MONTHS

Detailed Observations · Scene 50

Black Branch at this location (scene 50 of 53, near end of reach) is a severely impaired headwater stream in a rural agricultural landscape near Lebanon, Tennessee. The stream flows through a concrete box culvert under a road with virtually no riparian buffer on either bank. Agricultural fields and pasture extend to the stream edge, contributing heavy sediment loads that have transformed the substrate to silt/mud dominance. The channel is entrenched and disconnected from its floodplain. Instream habitat is critically poor with no significant woody debris, cobble, or habitat diversity. MS4 compliance concerns include non-compliant riparian buffers on both banks, no stormwater treatment for road runoff, and the culvert as a potential fish passage barrier.

Primary Stressors

sedimentation, riparian loss, channelization, bank erosion

Channel Assessment

Metric	Score	Notes
Channel Condition	3	The stream is channelized through a concrete box culvert at this location. The upstream reach shows some incision and bank erosion. The culvert represents significant channel alteration. Overall the channel shows evidence of straightening and modification associated with the road crossing. The natural channel upstream is somewhat degraded but not fully channelized.
Hydrologic Alteration	4	Moderate incision is evident upstream of the culvert with banks 3-6ft high relative to water level. The box culvert and road embankment constrict flow. The stream appears somewhat disconnected from its floodplain. Agricultural land use and road infrastructure limit floodplain access.
Sediment Deposition	3	The stream bed is dominated by silt and mud, indicating heavy sediment loading from the surrounding agricultural landscape. Fine sediment deposition is visible on the culvert floor and throughout the upstream channel. The turbid brown water suggests active sediment transport. Approximately 30-50% of the bed appears affected by fine sediment deposition.

Bank Assessment

Side	Stability	Veg. Protection	Erosion	Notes
Left	3	3	26_50_percent	Left bank transitions from unprotected eroding agricultural bank upstream to concrete culvert wingwall at the road crossing. Utility pole is situated near bank edge with some concrete foundation material. Minimal riparian buffer - agricultural field extends nearly to bank edge.
Right	4	4	1_25_percent	Right bank has slightly better riparian conditions than left, with scattered trees upstream providing some root protection. Residential properties visible beyond the right bank with mowed grass areas. Culvert wingwall in good structural condition.

Riparian Assessment

Metric	Score/Value	Notes
Canopy Cover	2	Very limited canopy cover. The UP view shows almost entirely open sky with only scattered bare tree branches at margins. Even in full leaf, the sparse tree cover along this reach would provide less than 25% shade. The agricultural land use and road crossing create a wide canopy gap.
Left Buffer Width	under 10ft	Score: 1/10
Right Buffer Width	10 25ft	Score: 3/10
TDEC 30ft Buffer Met?	L: No / R: No	Both banks fail to meet TDEC MS4 permit section 4.2.5.4 minimum 30ft buffer requirements. The left bank is the most critical with agricultural use extending to the bank edge, contributing to erosion and sediment loading. Right bank is slightly better but still non-compliant. Buffer restoration, especially on the left bank, would be highly effective given the flat agricultural terrain.

Water Quality & Infrastructure · Scene 50

Water Quality Indicators

Metric	Score	Notes
Water Appearance	3	Water is considerably turbid with brown coloration throughout all views. Visibility appears to be approximately 0.5-1ft based on the partially visible stream bed. The turbidity likely reflects recent rainfall runoff from surrounding agricultural fields. Sediment is the primary water quality concern visually.
Nutrient Enrichment	7	Algae: none
Manure/Waste	7	No direct evidence of manure or waste in the stream. However, the agricultural pasture/field extends to the bank edge on the left, and livestock access to the riparian zone cannot be ruled out (fencing is not clearly visible). No manure, waste pipes, or obvious agricultural waste was observed in the water.
Surface Contamination	-	Sheen: No · Foam: No · Odor: none

Stormwater Infrastructure

No outfall detected at this location.

Instream Habitat

Metric	Score	Notes
Epifaunal Substrate	-	

Stream Characteristics

Field	Value
Stream Type	perennial
Gradient	low_flat

Management Recommendations

Action	Priority	Timeline
Document box culvert in outfall/crossing inventory for MS4 mapping	high	90_days
Assess road runoff entering stream through culvert - no treatment BMPs present	medium	90_days
Conduct growing season follow-up survey to assess invasive species and summer water quality	medium	annual

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