Little Topashaw Creek
Stream Corridor Rehabilitation
Chickasaw County, Mississippi

An investigation was performed to determine the engineering properties of soils along the lower reach of Little Topashaw Creek. This project extends from the Webster County line north for approximately 3500 feet. This reach has undergone extensive erosion in the recent past and is planned for remediation using large woody debris structures as bank stabilization practices and willow posts as sediment traps.

INTRODUCTION:

This demonstration project is a joint effort between NRCS, ARS, and US Army Corp of Engineers. The project should be classified as Yazoo River Watershed (Fund: WF-03). Drilling of this project was performed on 3 and 5 December 1999 and 18 January 2000 using NRCS Giddings drill rig. Six holes were bored on the left side in close proximity to cut banks along the meanders. Additionally, three creek banks were logged and several holes were bored in the creek bed using a hand auger.

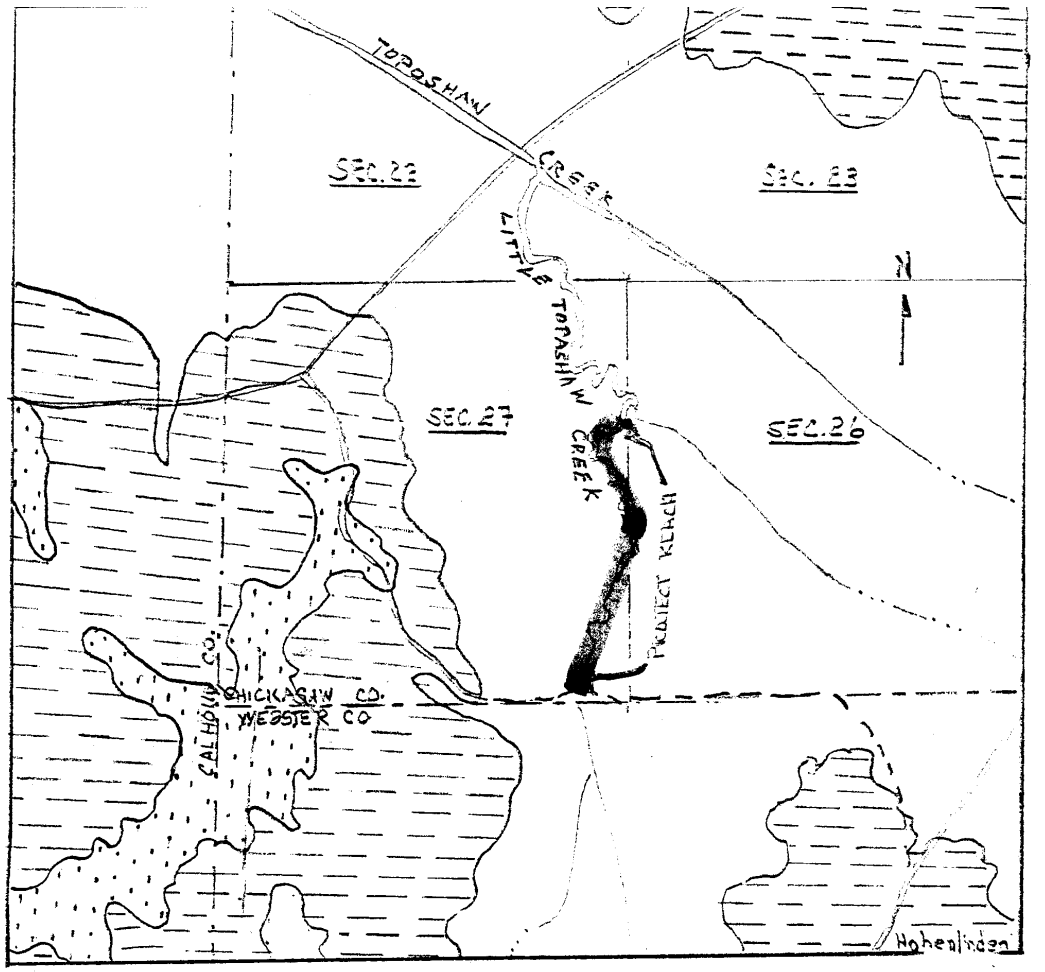
Selected soil samples, including four undisturbed core samples, were sent to NRCS Soils Mechanic Laboratory for testing. Results will be forwarded when received.

The Subwatershed is situated near the eastern limit of the topographical subdivision of Mississippi known as the Central Hills, very near the Flatwoods subdivision. Surface geology consists of primarily of alluvium derived from the Wilcox and Midway Naheola formations. Topography is relatively flat to moderately steep with some moderate to severe incised streams. Material encountered were predominately alluvial sandy and silty clays and sands in the upper section underlain by very micaceous shales of the Naheola formation.

SITE DATA:

This Site is located about 12 miles southeast of Calhoun City, MS in Section 27, T12S, R1E along the main channel of Little Topashaw Creek. Little Topashaw Creek drains approximately 8500 acres, mainly from Webster County. During the 1960's, four dam sites were investigated in the headwaters of this Subwatershed. Records indicate that only one was constructed, Y-27-15. The creek has been incised into the alluvium 14 feet upstream and 23 feet downstream of the project.

Hole 1 was bored on the left side, near the downstream limit of the project, to 32 feet. This hole found ten feet of slightly to moderately plastic clays (CL, samples 1.A-1.C) underlain by clayey and silty sands (SC & SM, samples 1.1-1.3) to 26 feet. Hard, fissile,



GEOLOGIC MAP

Yalobusha River Watershed

LITTLE TOPASHAW CREEK

STREAM CORRIDOR REHABILITATION

CHICKASAW CO., MS

micaceous shales were encountered from 26 feet to total depth. Wet soils were encountered at eight feet while boring. The hole caved in near 18 feet with 0.3 feet of water after 24 hours. An undisturbed core was taken in the upper clayey sands at ten feet. Creek depth at this location is approximately 22 feet (elevation 381.7).

Other holes bored at this site encountered similar soils (see logs and profile sheet). Additional undisturbed cores were taken at 14 feet in Hole 2, in the creek bed at the overfall (6A) and in Hole 9 at 15 feet. Standard Penetration Tests were conducted in the lower sands in Hole 5 between 13 feet and 20 feet with "n" = 3 blows per foot.

One overfall and several riffles are seen in the creek bottom in the upper quarter of the project. Resistant Naheola shales and weathered shales occur at these locations. Bedload else where in the creek exceeds four feet consisting of sands, clay balls and occasional gravel sized ferrous nodules

DISPERSION:

Several disturbed samples were collected for dispersion testing in the laboratory. Field Crumb test were performed as follows:

SAMPLE	DEPTH	½ HR	1HR	2HR	24HR
1.A	3 – 4	1	1	1	1+
1.B	5 – 7	1	1	1	1
2.1	6 – 8	3	4	4	4
2.3	27 – 29	1	1	1	1
3.A	3 – 4	1	1	1	1+
3.C	10 – 12	1	1	1	1
4.A	3 – 4	2	2	3	4
4.1	6 – 8	4	4	4	4
4.2	11 – 13	2	3	3	4
4.3	13 – 15	4	4	4	4

CONCLUSIONS AND RECOMMENDATIONS:

- Surface soils encountered in this investigation are very similar consisting of clays and silty clays that are slightly to moderately plastic with firm and medium consistencies.
- Soils are typically dispersive and highly erosive.
- Wet soils were encountered between depths of 6 and 12 feet when bored. Several logged banks were not wet above covered interval. Water levels measured after 24 hours were near and slightly above the creek bottom.

- If necessary, cofferdams and pumps should control drainage during dry weather construction. Also, the creek could be diverted upstream to a ditch that would bypass all but 500 feet of the project. Caution should be used not to divert a storm event. Ditch diversion could severly degrade channel bottom due to grade change.
- Several disturbed samples and two undisturbed samples were sent to Soil Mechanics Laboratory in Fort Worth, TX for index and dispersion testing. Results of the test will be forwarded when received.

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attachments

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