

EFA Soil Samples
Cherokee Co.
Road S-348

Tube Labeled: Sample #2 (Upstream Floodplain)

Preliminary Remarks:

Available sample length was approximately 26 inches. That sample was divided into three sections:

Section 2A ...0.0 to 10.0 inches
Section 2B ...10.0 to 20.0 inches
Section 2C ...20.0 to 26.0 inches

Due to the limitations of the soil extractor, a 10 inch sample is about the maximum length that could be tested. Each section will be subjected to a series of flow velocities. Each flow rate had a time duration of 1 hour or a total erosion amount of 50 millimeters.

The logging rate parameter of the "Erosion" program was set to 1 second. This logging rate will be the same for all of the following tests.

For sample designated 2A: (0.0 to 10.0 inches)

Soil Description: Reddish Silt Loam w/ Sand Loam pockets to Sand in lower portion

Test #2A-1
File name Tube2A Run1.txt
Velocity 0.3 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: No significant erosion visible.

Trim 6 mm

Test #2A-2
File name Tube2A Run2.txt
Velocity 0.6 m / sec
Total push 2 mm
Test duration 1 hour

Remarks: Small scour holes developed when Sand pockets eroded.

Trim 6 mm

Test #2A-3
File name Tube2A Run3.txt
Velocity 1.0 m / sec
Total push 7 mm
Test duration 1 hour

Remarks: Small, but deep scour holes developed in front and on side of flow.

Trim 25 mm

Test #2A-4
File name Tube2A Run4.txt
Velocity 1.5 m / sec
Total push 50 mm
Test duration 0.942 hours

Remarks: Scour holes developed on backside of the sample. Scour rate was steady with 18 mm of erosion in 44 minutes. A Sand layer was then exposed and the amount eroded climbed to the maximum of 50 mm in the following 12 minutes.

Trim 25 mm

Test #2A-5
File name Tube2A Run5.txt
Velocity 2.0 m / sec
Total push 50 mm
Test duration 0.087 hours

Remarks: Machine push rate could not keep pace with scour rate. The remaining 5 inches eroded quickly. As stated above in the Soil Description, the lower portion of test section 2A was comprised of Sand.

Testing Terminated on Section 2A

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For Sample designated 2B: (10.0 to 20.0 inches)

Soil Description: Reddish fine-grained Sand to clayey Silt Loam to Silty Clay

Test #2B-1
File name Tube2B Run1.txt
Velocity 0.3 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: Slight amount of erosion visible with isolated small scour hole.

Trim 6 mm

Test #2B-2

File name Tube2B Run2.txt

Velocity 0.6 m / sec

Total push 38 mm

Test duration 0.450 hours

then: 2 mm in the remaining 0.550 hours

Remarks: 38 mm of fine Sand eroded at a fairly constant rate in the elapsed time of 27 minutes. 2 mm of a newly exposed layer of Silt Loam was then subjected to the same flow velocity for the remaining 33 minutes with very slight visible erosion.

Trim 25 mm

Test #2B-3

File name Tube2B Run3.txt

Velocity 1.0 m / sec

Total push 25 mm

Test duration 0.083 hours

then: 6 mm in the remaining 0.917 hours

Remarks: The trimming of 25 mm of material exposes another fine Sand layer. This erodes away to the depth of 25 mm in just 5 minutes. A Silt Loam layer is now exposed to the same velocity. 6 mm is pushed in the remaining 55 minutes.

Trim 25 mm

Test #2B-4

File name Tube2B Run4.txt

Velocity 1.5 m / sec

Total push 3 mm

Test duration 1 hour

Remarks: The soil matrix tested at this velocity was more clayey. Soil description is Silty Clay Loam. Small, isolated scour holes developed.

Trim 25 mm

Test #2B-5
File name Tube2B Run5.txt
Velocity 2.0 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: The soil matrix is now described as a Silty Clay. Little to no erosion visible.

Trim 6 mm

Test #2B-6
File name Tube2B Run6.txt
Velocity 3.0 m / sec
Total push 42 mm
Test duration 0.169 hours

Remarks: The sample held steady for 4 minutes with little to no erosion. The sample then deteriorated rapidly. 42 mm were pushed in the next 6 minutes. The test was terminated when the final 2 inches, in it's entirety, lifted up and was then washed away.

Testing Terminated on Section 2B

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For Sample Designated 2C: (20.0 to 26.0 inches)

Soil Description: Reddish Silty Clay w/ Sand pockets.

NOTE: Since section 2C is a clayey material, testing will begin at a flow velocity of 1.0 m / sec.

Test #2C-1
File name Tube2C Run1.txt
Velocity 1.0 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: Small isolated scour hole developed.

Trim 6 mm

Test #2C-2

File name Tube2C Run2.txt

Velocity 1.5 m / sec

Total push 15 mm

Test duration 1 hour

Remarks: The scouring of Sand pockets led to an irregular erosion of the clayey material.

Trim 6 mm

Test #2C-3

File name Tube2C Run3.txt

Velocity 2.0 m / sec

Total push 50 mm

Test duration 1 hour

Remarks: Scour rate was somewhat erratic as sandy material eroded away to clayey material, then back to sand ...etc.

Trim 6 mm

Test #2C-4

File name Tube2C Run4.txt

Velocity 2.5 m / sec

Total push 28 mm

Test duration 0.772 hours

Remarks: This bottom portion of section 2C had fewer sand pockets and was more uniform in it's clayey matrix. The test was terminated after 43 minutes when the remaining 1 inch of the sample began to lift up out of the tube. A scour hole had developed on the front of the sample.

End of Testing for Tube Labeled “ Sample #2 “ (Upstream Floodplain)