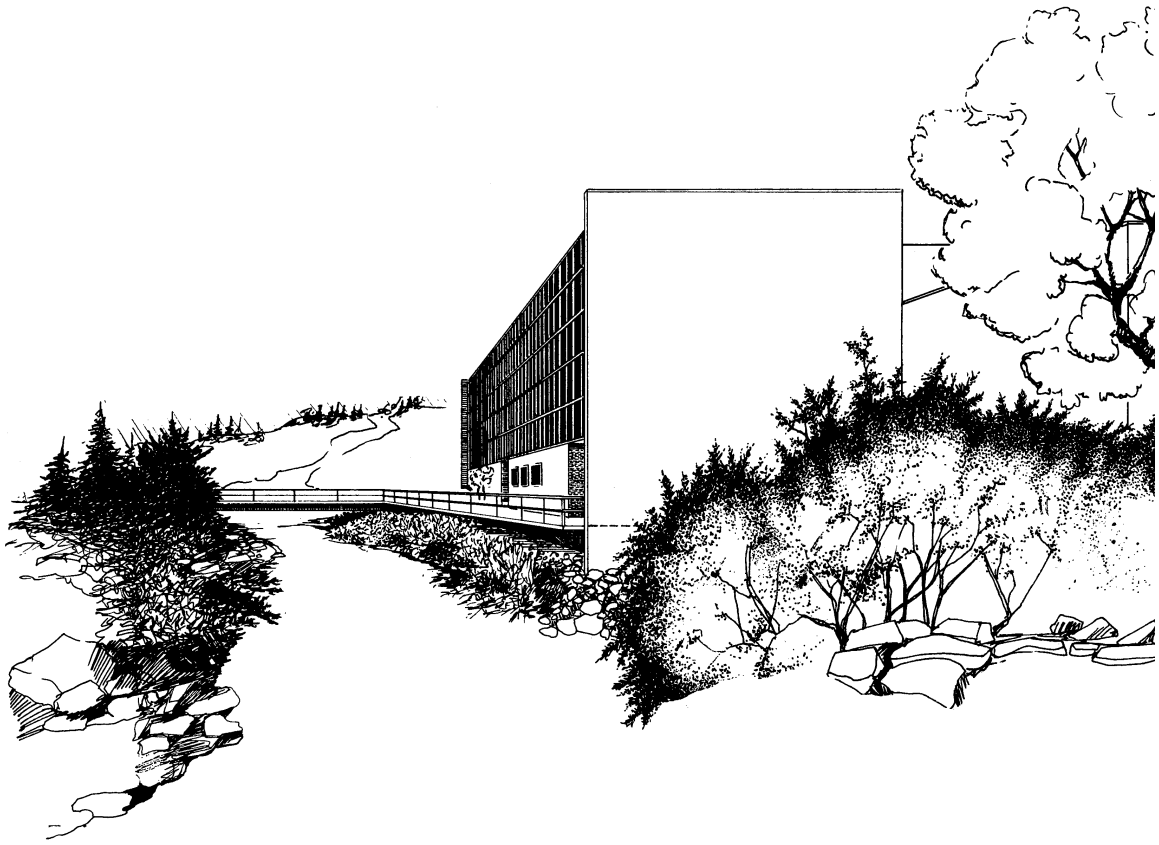
EROSION CONTROL TESTING OF GEOMATRIX HIGH-PERFORMANCE SPRAY-ON BLANKET: STAGE I, STAGE II, STAGE III IN THE RAINFALL SIMULATION FACILITY

Prepared for

GeoEnviromental Inc.

April 22, 2022



UTAH WATER RESEARCH LABORATORY

Report No. 4532

EROSION CONTROL TESTING OF GEOMATRIX HIGH-PERFORMANCE SPRAY-ON BLANKET: STAGE I, STAGE II, STAGE III IN THE RAINFALL SIMULATION FACILITY

Submitted to:

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April 22, 2022

OVERVIEW OF REPORT ORGANIZATION

This report has been separated in to three sections. Section-1 includes executive summaries of each test product, including turbidity test results. Section-2 contains a general overview of the test setup and procedures. Section-3 (Appendices) includes test photos, tabular runoff data, and bare-soil runoff data.

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Utah State University

EXECUTIVE SUMMARY

The following erosion control product was tested in the rainfall simulation facility at the Utah Water Research Laboratory, Utah State University. Test conditions and results are summarized below.

Client	*GeoEnvironmental*
Date	*04/22/22*
Rainfall Rate	*5 in/hour*
Bed Slope	*2.5:1*
Event	*60 min*
Plant Establishment	*No*
Plot	*North*
Plot Width	4 ft
Product	***GeoMatrix HPSB Phase I***
Mix/Application	*3,000 lb/acre*

	0 to 30 Minutes	30 to 60 Minutes
Soil Runoff (lbs)	0.00	0.05
Water Runoff (lbs)	5.60	181.69
Sediment Runoff Rate (lbs/hr)	-0.01	0.10
Water Runoff Rate (lbs/hr)	11.21	363.38
C factor	0.0000	0.0002
Average C factor	0.0001	
Bare Soil Data	July 2016	
Average Plant Height (in)	N/A	
Plant Density (%)	N/A	

General Observations:

Minimal raindrop damage occurred during the first 30 minutes. minimal raindrop damage continued during the second 30 minutes.

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Rainfall Simulator

The rainfall simulator is a drip-type device in which raindrops are formed by water emitting from the ends of small diameter brass tubes. The rate of flow is controlled by admitting water into manifold chambers through fixed orifice plates under constant hydraulic pressure. Five separate inlet orifices are used in each chamber or simulator module. The ratios of the areas of the tubing to the orifices are 1, 2, 4, 8, and 16. By controlling the water flow to the orifices with electric solenoid valves and the water pressure with a movable head tank, it is possible to vary rainfall rate from approximately 2 to 25 inches per hour. The underside of each chamber or module is equipped with evenly spaced brass tubes. Each module is a 24-inch square enclosed box about 1-inch deep and oriented so that the ends of the tubes or needles form a horizontal plane to let the water drip to test plots below. Each module has 576 needles spaced on a 1-inch square grid pattern.

The rainfall simulator consists of 100 adjacent modules spaced to form a square rain simulation panel with a surface area of 400 square feet. Each module can be controlled separately. The 500 electrical control switches are manually actuated via a control panel.

Raindrop sizes are representative of typical high intensity storms. The spatial distribution of rain is essentially uniform.

Test Flume

The test products are applied over bare soil in a test flume. The square test flume measures approximately 20 feet on each side and can be tilted to any angle from horizontal up to approximately 1 1/2:1 (H:V) slope. The rainfall simulator is supported over the flume so that rain falls directly onto the test plots. The plots contain a 1-foot depth of soil, supported by a metal grating covered with a filter cloth through which water can drain.

The flume features three 4-ft x 19.5-ft plots. The plots are separated from each other and from the sidewalls by 2-foot wide walkways. The rainfall simulator is operated such that the rain falls only on the plots and not upon the walkways.

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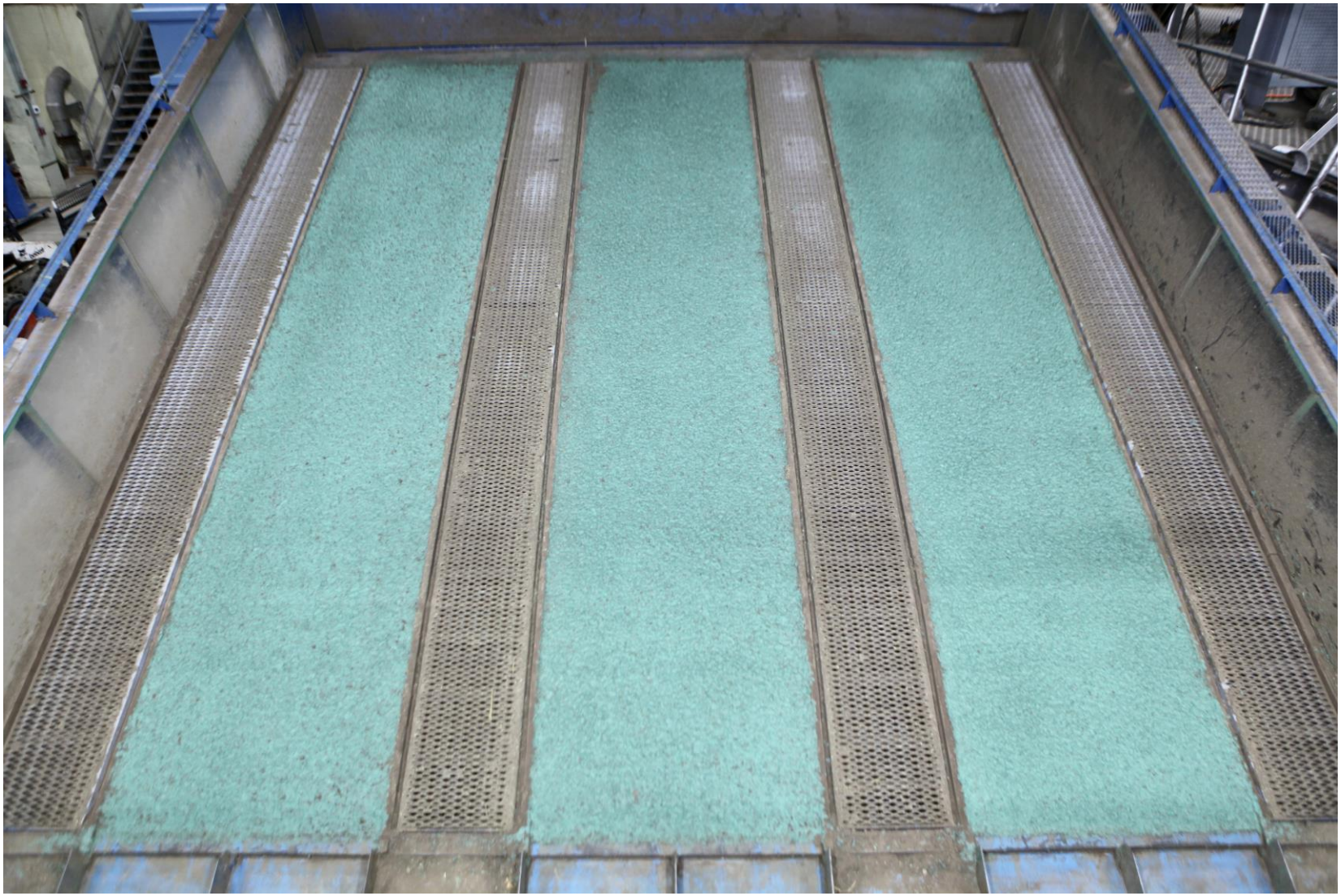

Photo 1. Pre-test conditions.

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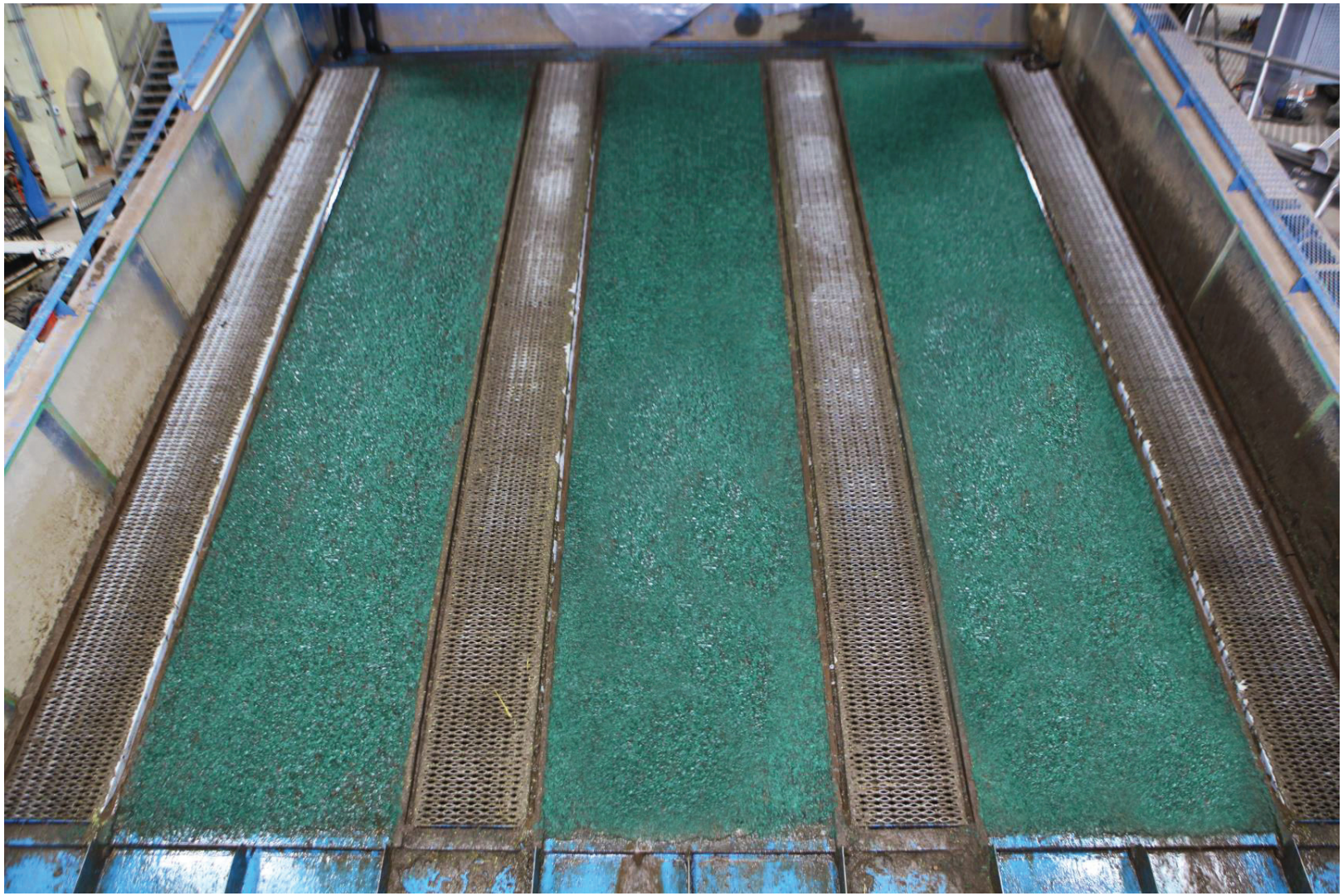

Photo 3. Test conditions after 60 minutes.

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APPENDIX C

Bare Soil Data

Bare Soil Data

Date	*July 2016*
Rainfall Rate	*5 in/hour*
Plot Width	4 ft
Bed Slope	*2.5 to 1*

	0 to 30 Minutes	30 to 60 Minutes
Soil Runoff (lbs)	146.05	250.92
Water Runoff (lbs)	506.96	600.06
Sediment Runoff Rate (lbs/hr)	292.11	501.85
Water Runoff Rate (lbs/hr)	1013.91	1200.11

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