September 19, 2008

Ms. Kellyn Hargett
GeoHay, LLC
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(info@geohay.com)

RE: **Bench-scale Sediment Retention Device Testing** (Log # E2280-14-10)

Dear Kellyn:

TRI appreciates the opportunity to provide testing services in support of the characterization of a range of sediment retention devices in bench-scale testing. Following is a summary of the testing strategy employed and a review of the test results.

STRATEGY

A standard performance-related index test (ASTM D 5141) is commonly used to characterize silt fence efficiency. TRI has adopted this testing method and modified it for sediment retention characterization testing of other types of sediment retention devices (SRD).

TESTING APPROACH

TRI's bench-scale SRD characterization test method utilizes a laboratory-scale testing apparatus, rather than full-scale field simulation. As shown in the appendix, the test apparatus includes a bench-scale flume as described in test method ASTM D 5141, "Determining the Filtering Efficiency and Flow Rate of a Sediment Retention Device Using Site-Specific Soil". In the test, a vertical SRD is positioned across the mouth of the flume to intercept a prescribed sediment-laden flow. The amount of flow (50 L / 13.3 gal) and sediment (0.15 kg / 0.33 lb) and the maximum particle size (2mm / #10 sieve) is detailed in D 5141.

The amount of soil that passes through the SRD is collected, subjected to vacuum-assisted filtration, dried, and weighed. The weight of collected sediment is compared to the initial amount put into suspension to determine the filtering efficiency of the SRD.

Additionally, the time for the flow to completely pass through the SRD, or – if the water has not all passed through in 25 minutes – the amount of water/sediment retained behind the SRD after 25 minutes is determined and used to calculate the SRD flow rate.

TEST SEDIMENTS:

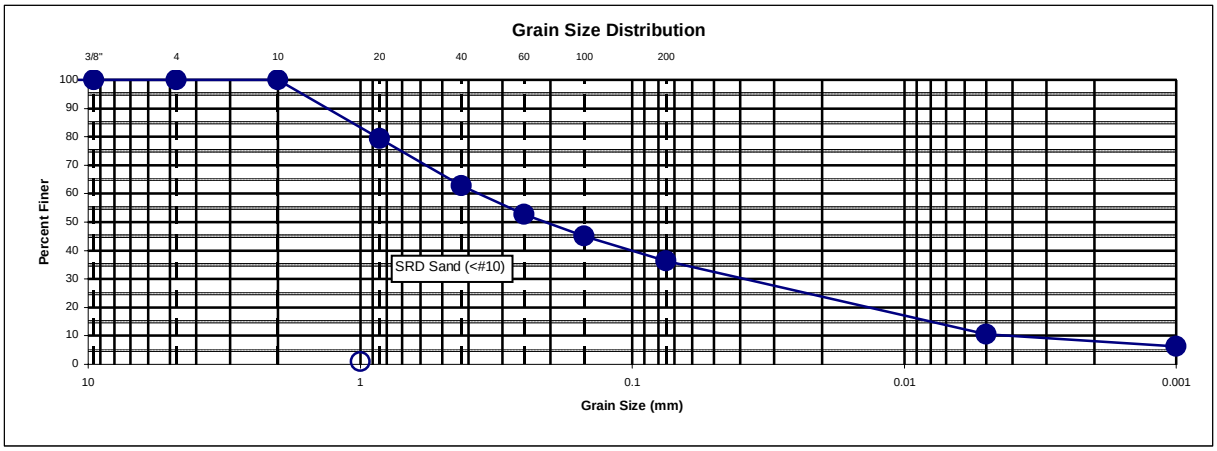


Figure 1: Gradation of Soil used for Testing

SUMMARY OF TEST RESULTS:

Table 1: Summary of Average Test Results for All SRDs

Sediment Retention Device	Flow Rate (gpm/ft^2)	Filtering Efficiency (%)	% Turbidity Reduction
15" Bale - North Carolina Fiber Source	6.561	95.1	87.9
15" Bale - Georgia Fiber Source	5.881	97.3	91.1
15" Bale - Needle Punch Source	1.665	98.0	99.4
12" Bale - Georgia Fiber Source with Netting	6.693	97.7	88.9
9" Inlet Filter - Needle Punch Source with Netting	5.223	93.1	86.3
9" Inlet Filter - Georgia Airlay Source with Netting	8.962	94.1	85.1
Terra Tube	5.428	91.6	91.2
Excelsior Wattle	15.437	67.8	49.2
Straw Bales	10.505	82.8	70.0
Nonwoven Fabric Silt Fence	0.974	89.1	62.4
Wood Chip Wattle	12.252	78.2	51.7

Detailed data tables and figures, along with SRD pictures are included in the Appendix.

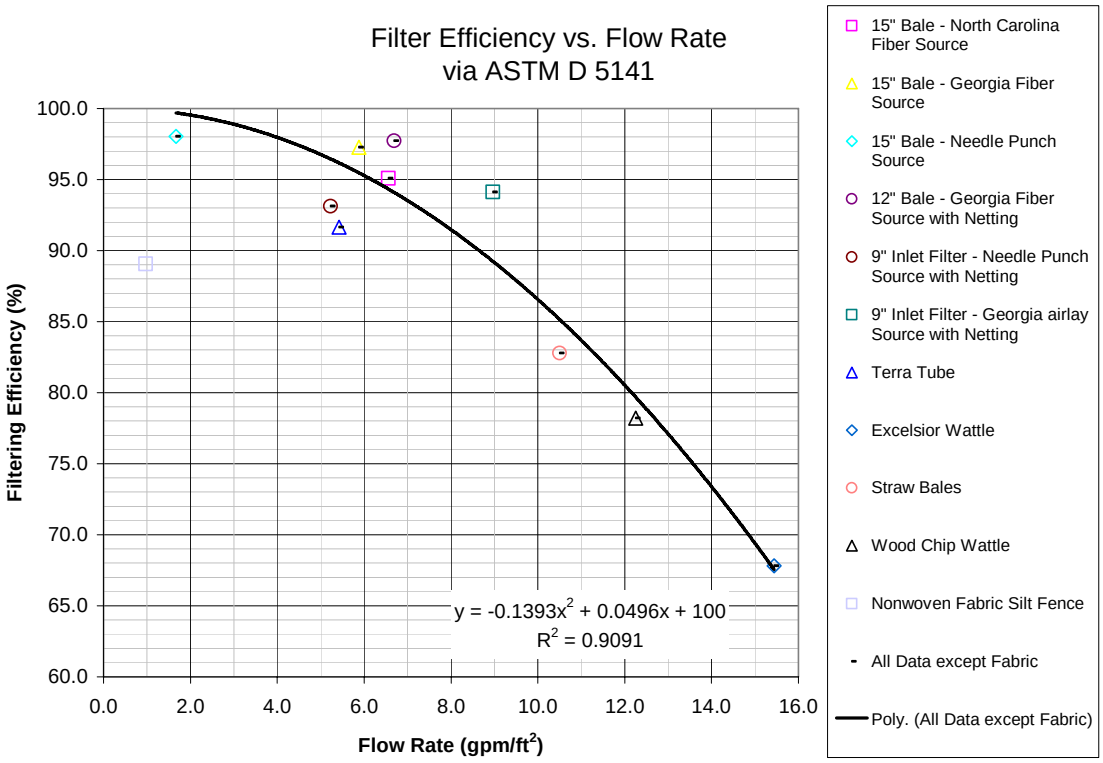


Figure 2: SRD Filtering Efficiency vs. Flow Rate

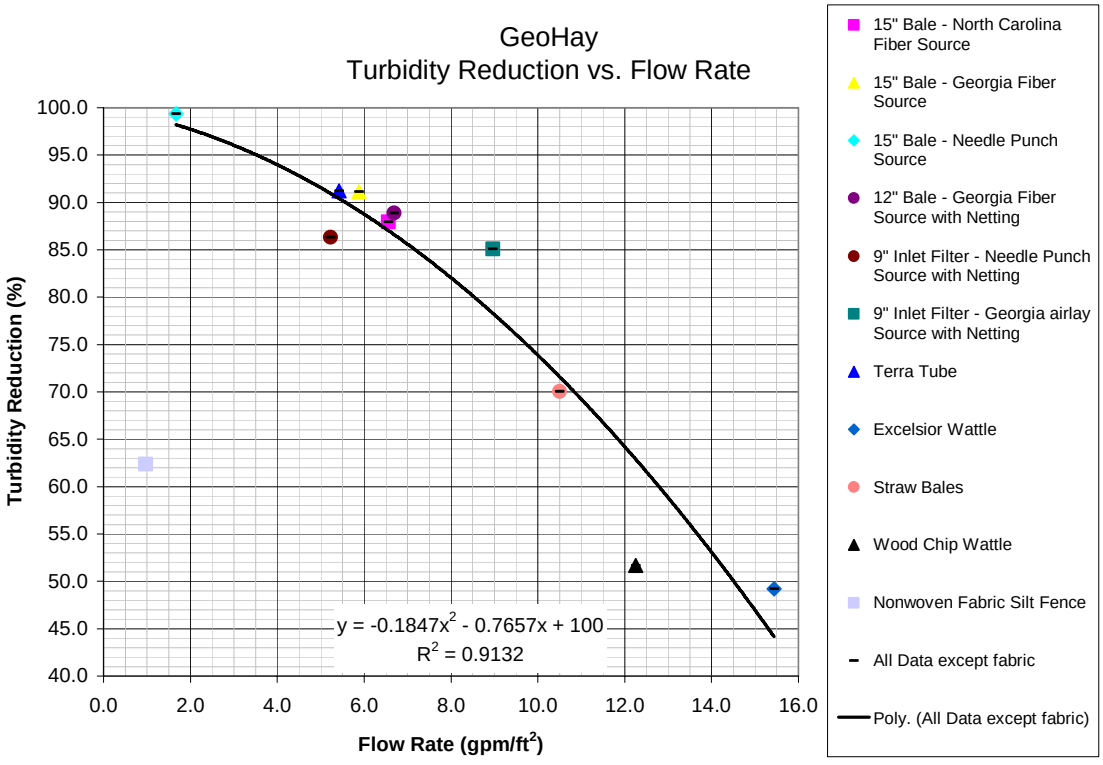


Figure 3: SRD Turbidity Reduction vs. Flow Rate

OBSERVATIONS AND CONCLUSIONS:

It has long been presumed that a sediment retention device (SRD) can provide either high sediment retention OR high flow rates, but NOT BOTH. The test results, as represented in Figures 2 and 3, appear to present compelling evidence that there is a strong relationship between flow rate and both filtration efficiency and turbidity reduction. Specifically, as the SRD permits greater flow rates, its ability to retain sediments is reduced. This predictable behavior would suggest that a suitable product can be selected to address project-specific flow/retention criteria. The data also shows clearly that NOT ALL SRDs PERFORM THE SAME!

While this testing program focused on 3-dimensional SRDs, a single 2-dimensional silt fence fabric was included. Interestingly, the silt fence fabric did not exhibit the same balance between flow rate and sediment retention as did the 3-dimensional materials. While it is recognized that there are many, many possible fabrics for silt fence, the limited data produced in this testing suggests that 3-dimensional structures may provide a better balance between flow rate and sediment retention than do 2-dimensional structures.

Please note that the results presented are based on the testing strategy described and carried out herein and do not purport to represent actual field behavior nor to apply to all soil types. If you have any questions concerning the results or conclusions, please call me at 864/242-2220. Thank you for the opportunity to help you in this research effort.

Very truly yours,

C. Joel Sprague, Sr. Engineer
TRI/Environmental, Inc.

xc: Sam Allen; Jarrett Nelson

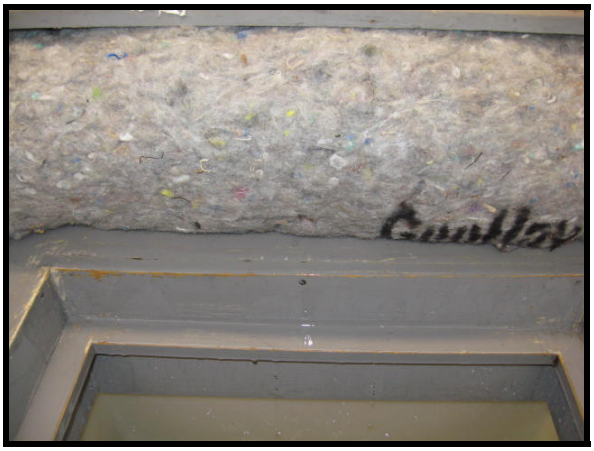
APPENDIX
PICTURES & DATA


ASTM D 5141 Testing Apparatus


15" Bale - Needle Punch Source

15" Bale - North Carolina Fiber Source


12" Bale - Georgia Fiber Source & Netting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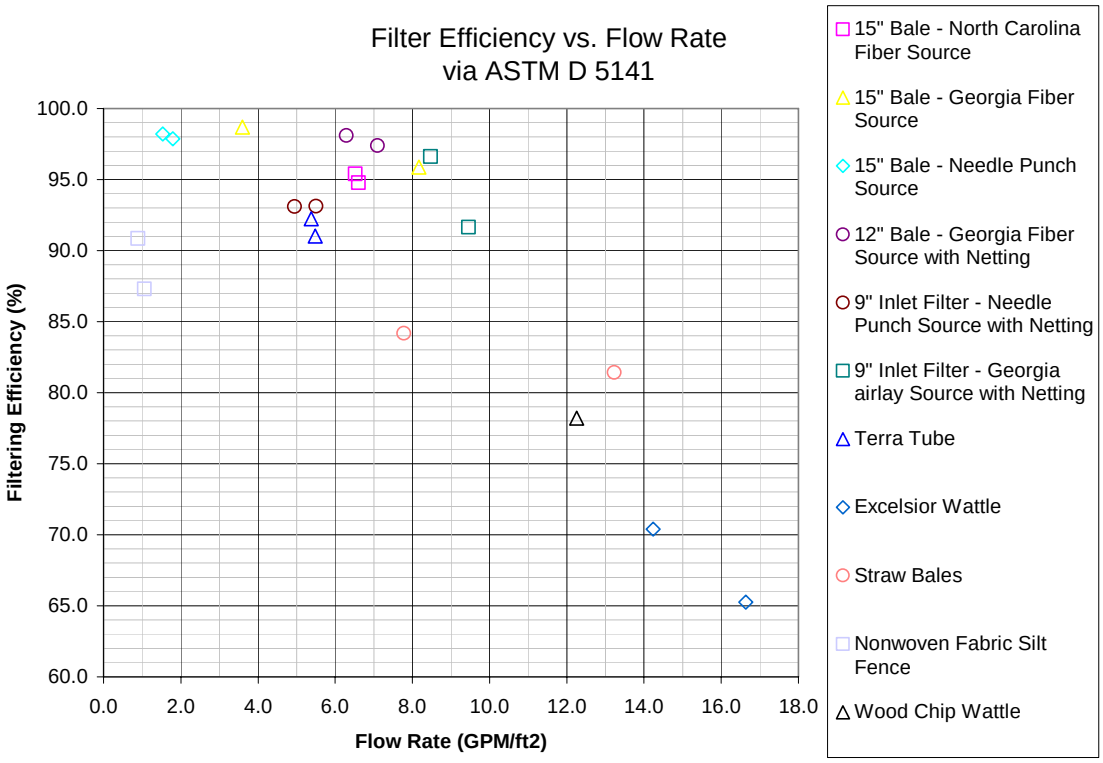
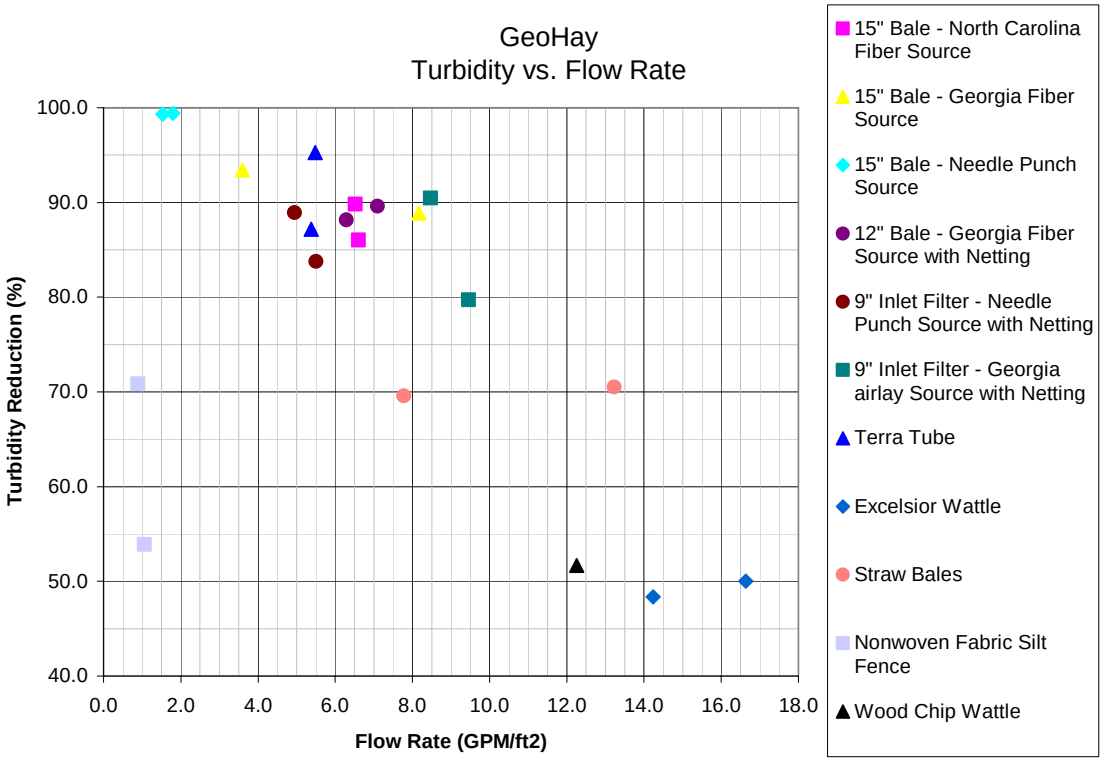


Flow Rate vs. Filtration Efficiency – All Data



Flow Rate vs. Turbidity Reduction – All Data