

Purpose:

Determine the general effect of Concrete Cloth hydration on water pH.

Background: The first testing in the US to evaluate the leachate or excess hydration water coming off of the Concrete Cloth was performed by the CTL Group (Skokie, IL). The experimental program consisted of two stages: stage 1, a known volume of water was sprayed on to a piece of dry un-hydrated Concrete Cloth of known dimensions. The water coming off the Concrete Cloth was analyzed; stage 2, a known size sample of hardened Concrete Cloth was sprayed with water and the water was collected that ran off the Concrete Cloth and the water was analyzed. In both stages, levels of various compounds were found to be at very low levels or non-detectable levels.

The only significant finding of the CTL testing was that the pH levels during stage 1 were found to be higher than neutral. During stage 2, wetting the hydrated material had minimal effect on the pH.

With this in mind, combined with the fact that fish such as trout don't thrive outside a pH range of 5 to 9.5, it was decided to roughly determine the ratio of Concrete Cloth area to a known volume of water that would elevate the pH above this pH range.

Procedure:

Approximately 1000 square feet of Concrete Cloth was installed at the TRI Environmental test facility near Clemson South Carolina. The primary purpose for the installation was to measure the Manning's "n" coefficient. A secondary purpose was to get an idea of the effect of Concrete Cloth hydration water on the pH of two small basins downstream from the test channel. The photo to the right shows the hydration process of the channel. All of the excess hydration water ran first into a small stilling basin that was less than 2 cubic feet before the hydration process and swelled to about 5 cubic feet then overflowed into the larger stilling basin that swelled from about 100 cubic feet to something less than 300 cubic feet. The larger reservoir in the background of the photo was kept completely separate from these two basins.



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Observations:

The pH of the hydration water was determined before it came in contact with the Concrete Cloth. Then samples were taken from the basins after the Concrete Cloth was hydrated. The effect on pH appears to have been reduced for the large basin. The most obvious reason for this is that the elevated pH from the excess hydration water was diluted by the original volume of water that was present before hydration began. Among the secondary factors affecting this result may have been the water coming into contact with the soil (soil pH is unknown) after exiting the Concrete Cloth channel and the pH of rain water running off a nearby gravel lot.

Test Location	Area of Concrete Cloth Hydrated	Volume of Hydration water	Body of water volume after addition of excess hydration	Average pH Measured
TRI Environmental Site hydration water pH	NA	NA	NA	<8
Large Basin before hydration	NA	NA	NA	8.2
Collection of first hydration water at end of the installation	About 1000 sqft	First 1 pint to reach end of channel	0	11.6
Small basin just below the installation after initial full hydration	About 1000 sqft	20 to 30 cubic feet	5 cubic feet	11.6
Small basin just below the installation after second full hydration	About 1000 sqft	40 to 60 cubic feet	5 cubic feet	11.1
Large basin after hydration was complete	About 1000 sqft	40 to 60 cubic feet	Something less than 300 cubic feet	8.5
Large basin 2 weeks after hydration during channel test to determine Manning's "n"	About 1000 sqft	large	Something less than 300 cubic feet	<8

Conclusions:

The effect of excess hydration water coming off of Concrete Cloth on an existing body of water is dependent on the area of Concrete Cloth that is hydrated and the volume of the body of water downstream of an installation. A reasonably large enough body or volume of water will be minimally impacted.

Recommendations:

The pH of large volumes of water will be minimally impacted by the excess hydration water coming off of Concrete Cloth.

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