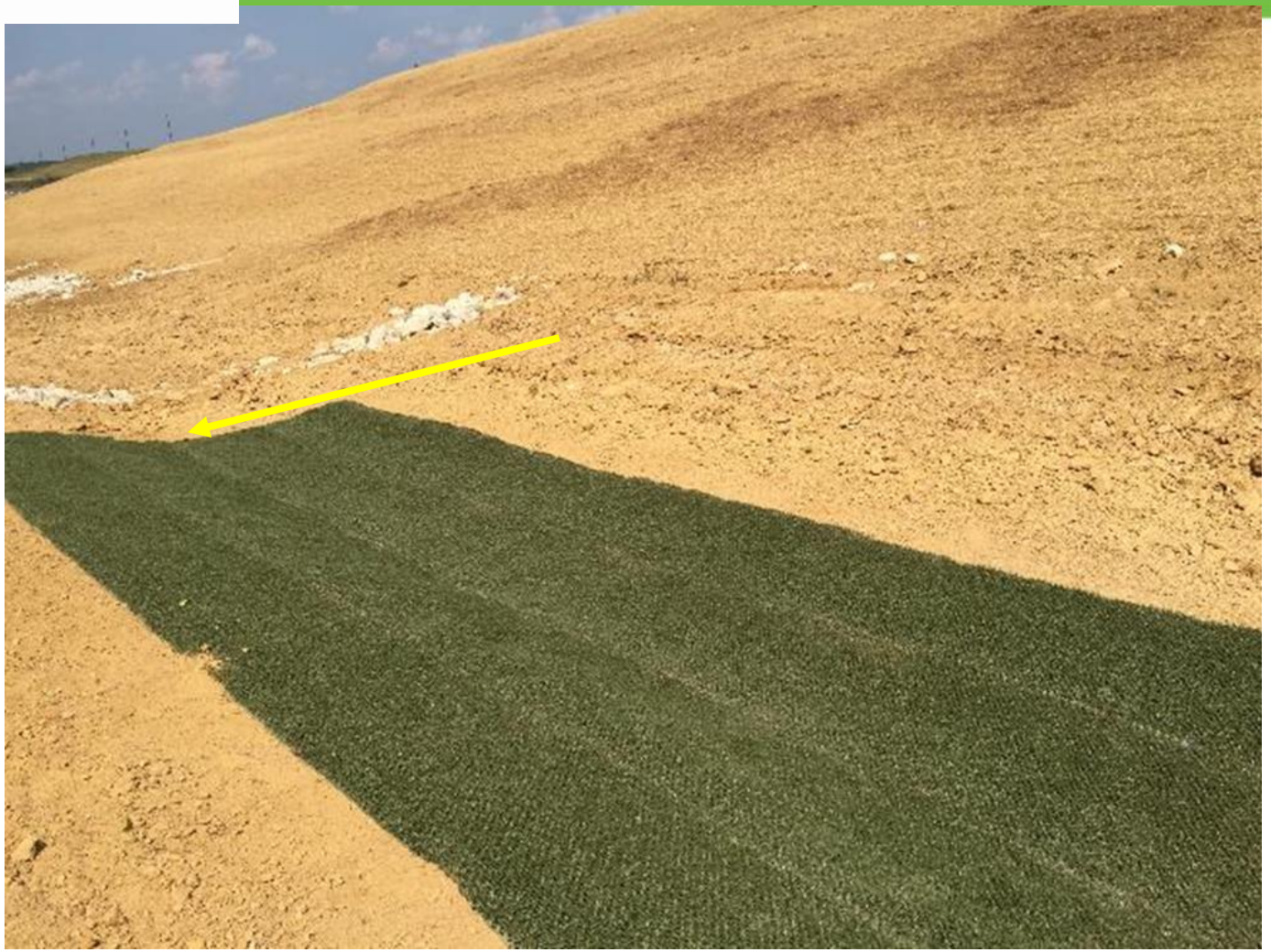
Peabody Coal – Channel Field Trial for Rock Replacement

ShearForce10 ECTRM Installed over cool season grass mix in high flow channel at the base of an overburden cap on September 10, 2019. Objective: Evaluate potential as rock riprap replacement in high flow areas.

Test Section Installation



Mats were installed between rock checks using 8 inch sod staples and 6 inch fabric pins on 1.5 ft centers according to published InstaTurf installation guidelines. Note small sections of channel downstream and upstream of mats left unprotected for comparison.

Test Section Installation

Upslope terminal ends of mats were trenched in approximately 6 inches (left). Mat edges at top of both sideslopes (Right photo) and downstream terminal ends were simply stapled on 9 inch centers with loose soil placed over edges.

InstaTurf ShearForce10 Installed and Ready for Action!

Completed ShearForce10 Installation looking down channel grade

Nearly One Month Later, Waiting for Rain!

Due to the lack of rainfall in September (.6 inch total), very little germination had occurred by Oct 7

Major Erosion Damage of Unprotected Areas Caused by Late October Storms

…Just two weeks later, the rains came, with major storm events on Oct 21 (1.65 in) and Oct 26 (2.2 in) wreaking havoc on straw mulched slopes/channel bottom and riprap check dams as apparent in these photos taken Nov 20. Over 6.5 inches of rain fell in October, what a mess!

ShearForce10 Test Section

As illustrated by the severe erosion and scour of adjacent unprotected soils , the simulated turf ECTRM performed incredibly well at armoring the channel, while growing and reinforcing natural grass under extreme conditions!

ShearForce10 Test Section

Upslope view of ShearForce10 just after installation on Sep 10 (left) and on Nov 20 (right).

The Consequences of Underestimating Flow Depth

But wait, there's more. Apparently we should've used more ShearForce10! The right sideslope (looking downstream) where no ShearForce10 was used was badly scoured by over 8 inches. Incredibly, the ShearForce10 prevented erosion of soils and vegetation directly under it. Never seen anything like this before!

Test Section

The staple anchor check at top edge of left sideslope (if looking downstream) effectively prevented rills in unprotected upslope area from undermining the ShearForce10.

Scour of Unprotected Downstream “Control” Section

The unprotected area downstream from the ShearForce10 and rock check exhibited severe scour.

In mid-March 2020, the ShearForce10 test section was still solid, in spite of an extremely rainy winter with no snow fall. However, the rock check dams above and below the ShearForce10 test section had blown out.

InstaTurf SHEARFORCE 10 Soft Armor Rock Solid Protection ™

Where InstaTurf Stops, Erosion Starts!