

Finding Sediment Basin Solutions through Large-Scale Testing at the Auburn University Erosion and Sediment Control Testing Facility

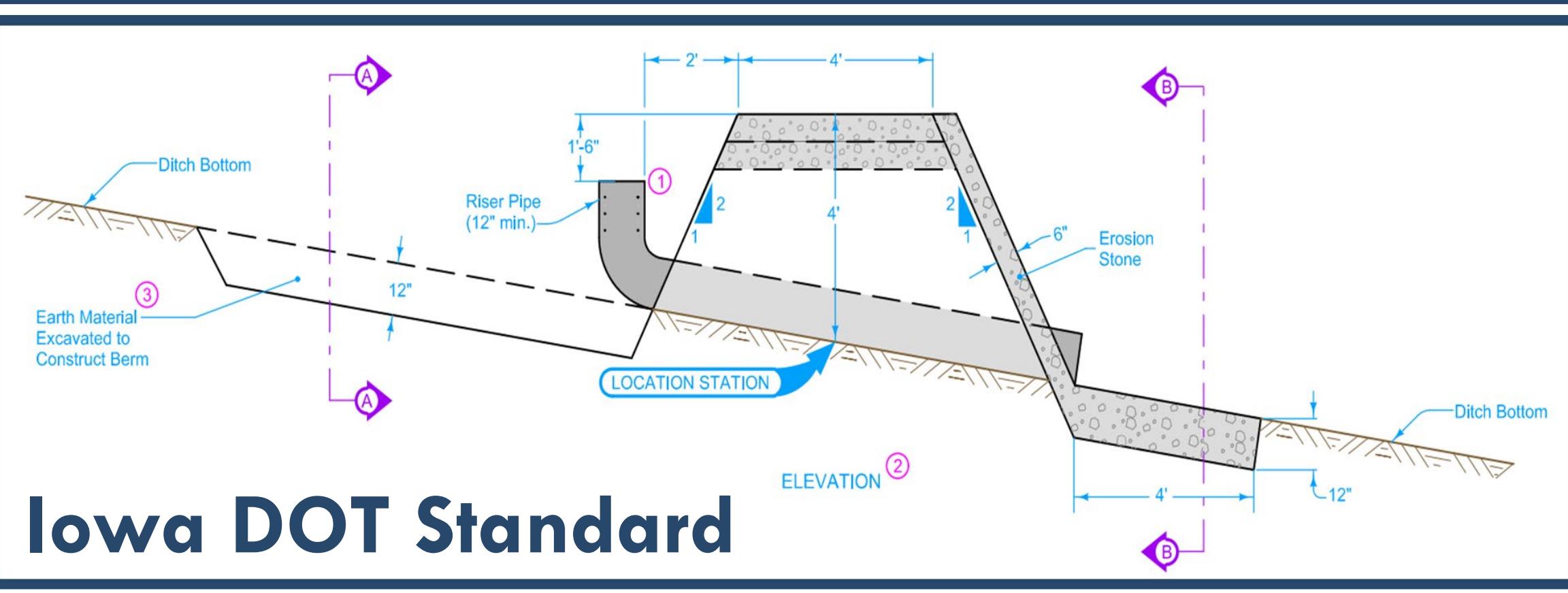


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Sediment basins **capture**, **detain**, and **treat** stormwater by providing residence time to promote gravitational settling of suspended particles prior to offsite discharge.

How does an in-channel sediment basin perform during construction?

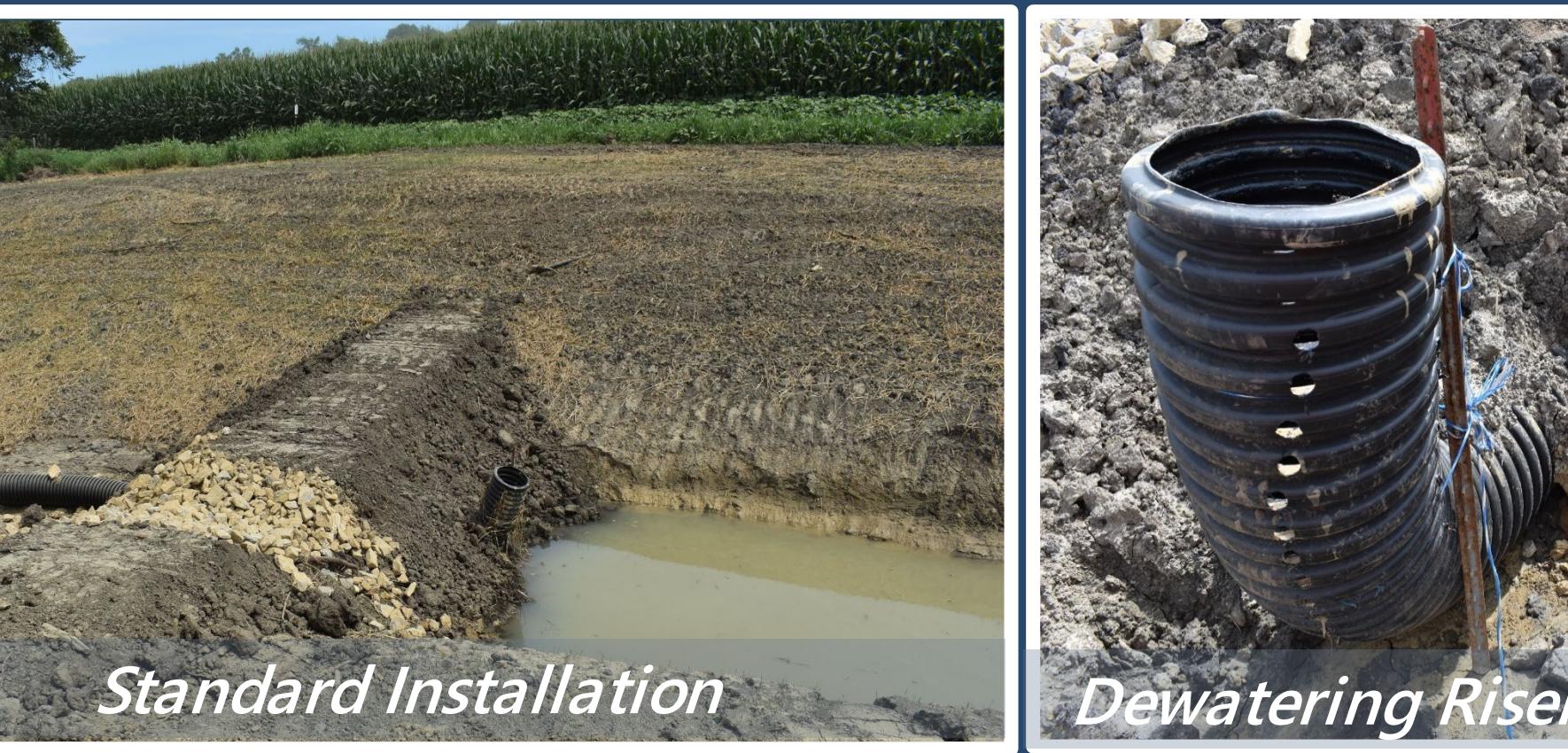


Iowa DOT Standard

A field-monitoring effort on Highway U.S. 30 in Tama County, IA in 2018-2019 indicated the current basin design provided negligible treatment.



Standard Installation



Dewatering Riser

Phase I Completed ✓

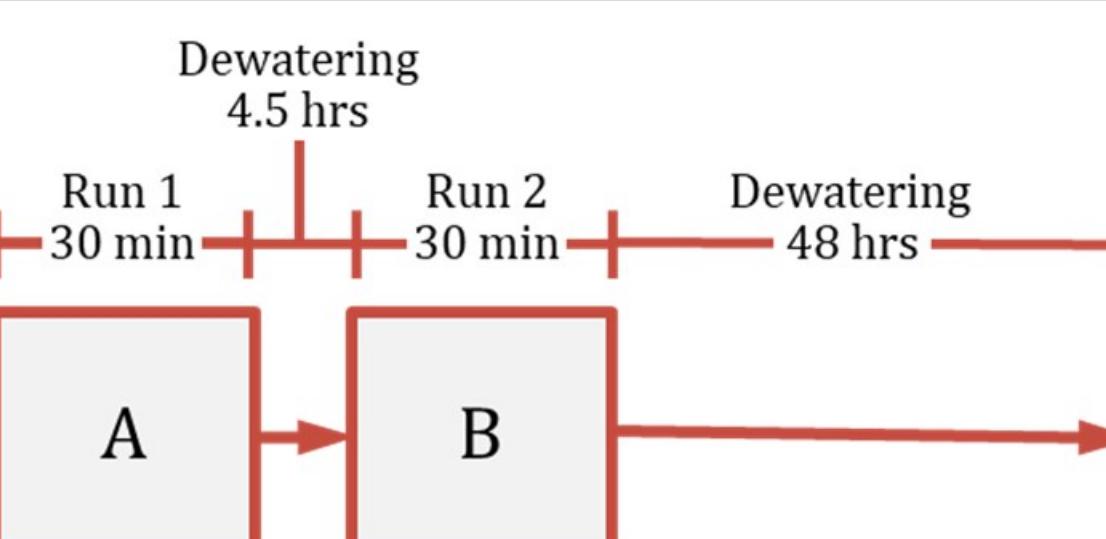
In-Channel Basins

- Uses existing roadside channel
- Minimizes basin footprint
- Increases L:W ratio

Testing and Data Collection

Each test consists of (a) filling and (b) overflow periods before dewatering.

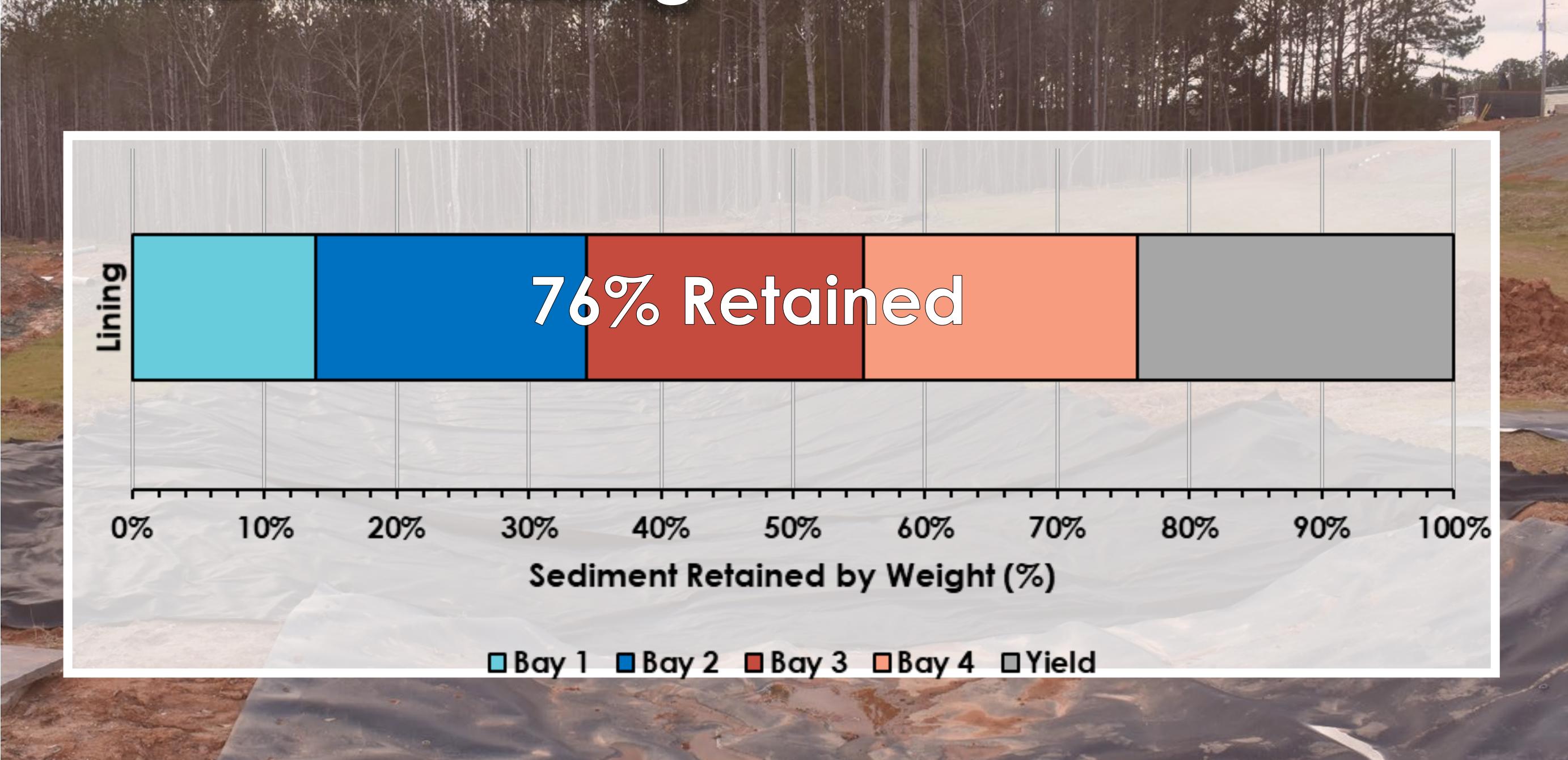
Flow Intro: 1.70 ft³/s Sediment Intro: 65.3 lbs/min



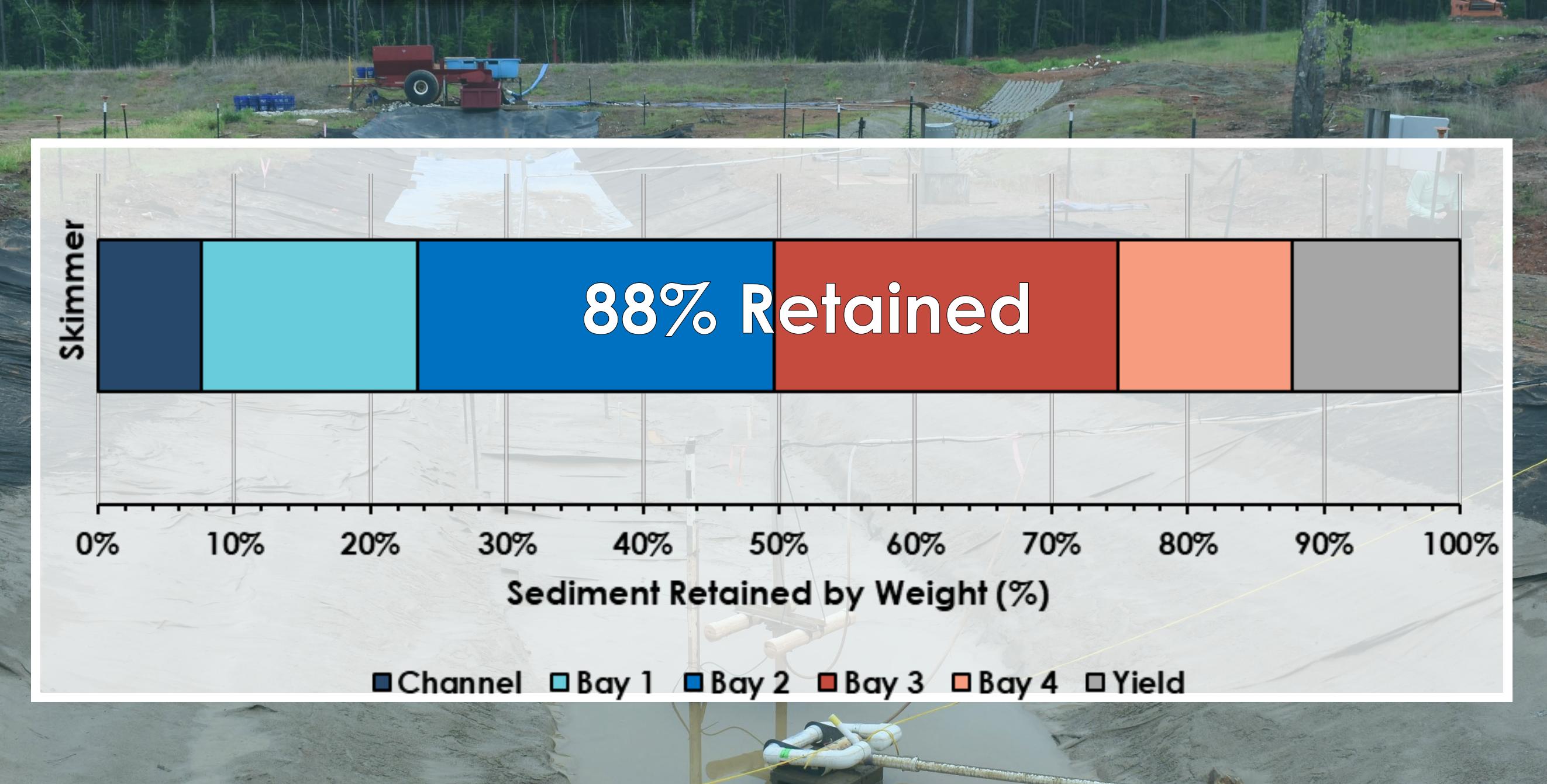
This is repeated
3x
to make a set.

- Water quality and quantity measured during each test
- Sediment volume and weight measured after each set

Geotextile Lining



Surface Skimmer



Phase II Ongoing

How can sediment capture be improved using an in-channel sediment basin?

Full-Scale Testing

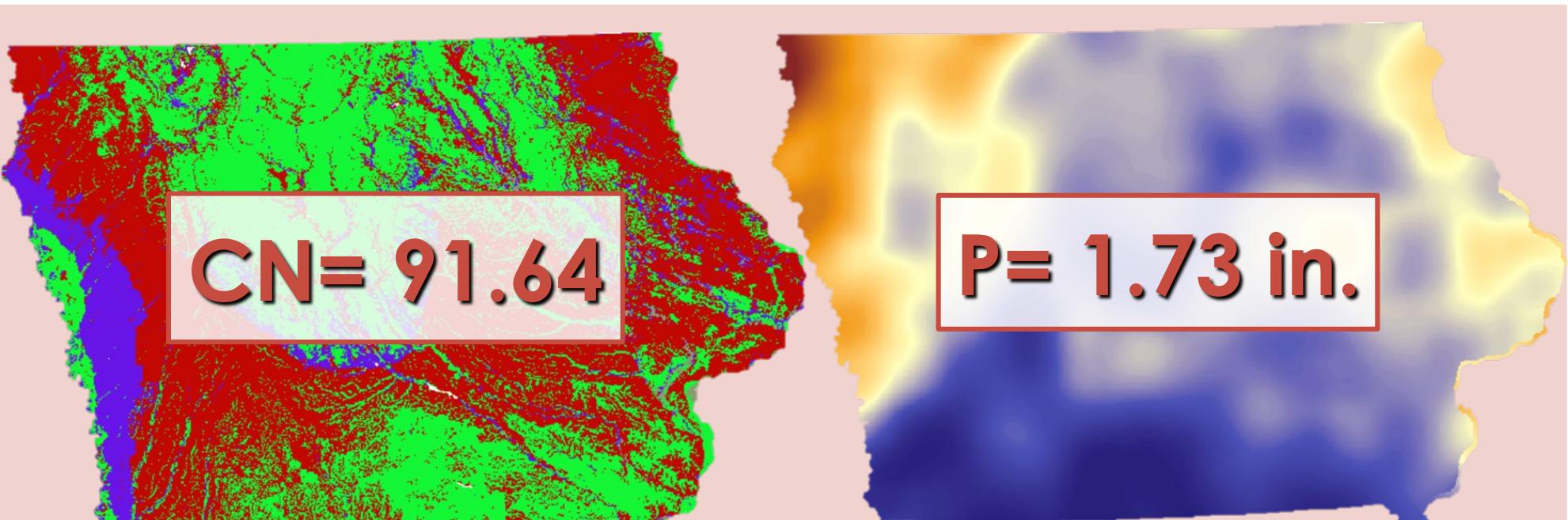
Iowa DOT standard channel was constructed to evaluate performance with various structural treatments. Flow and sediment are introduced.

Basin Volume: 3,000 ft³
Contributing Area: 0.84 ac

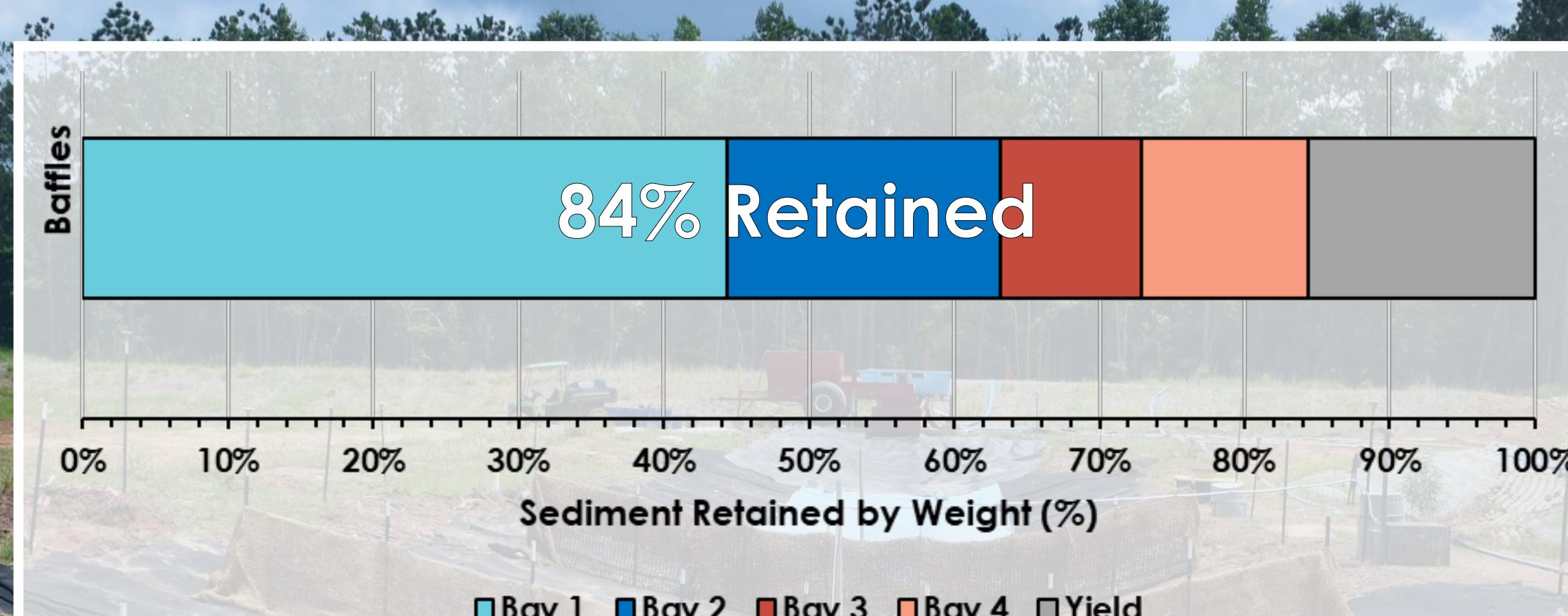


Simulated Runoff

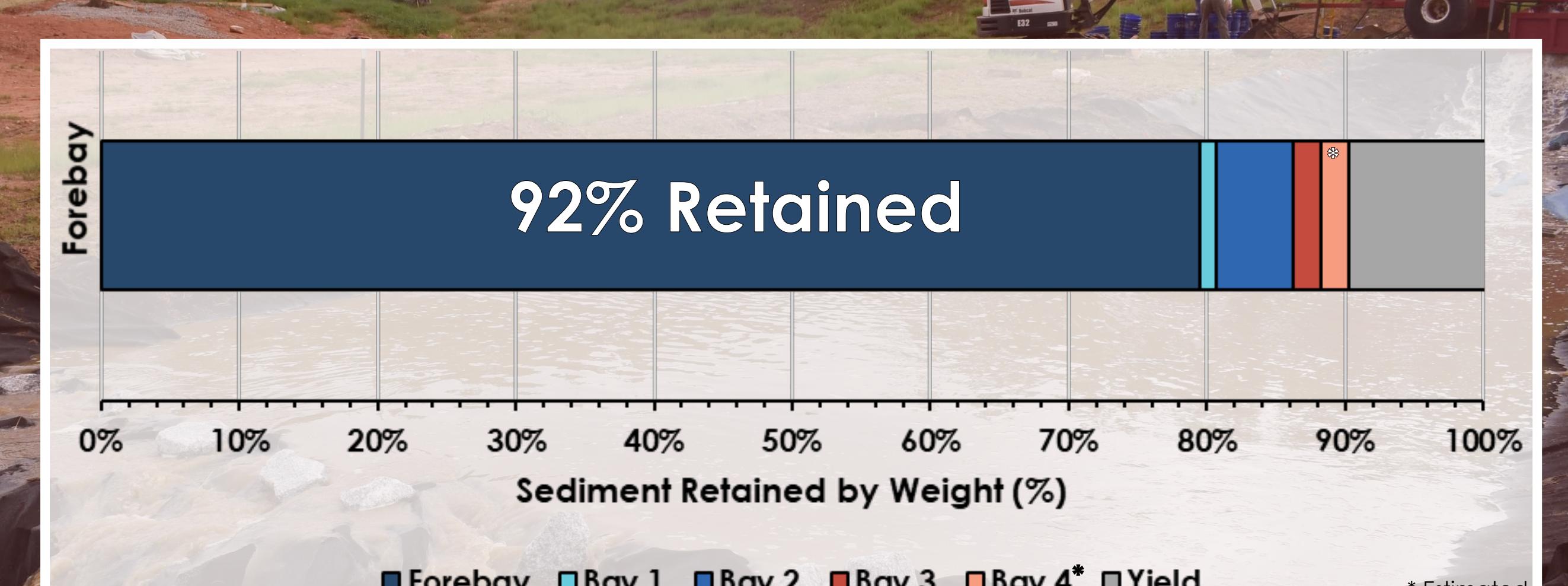
Sediment and flow introduction were calibrated using Iowa average rainfall & curve number. Iowa native soils used during testing.



Flow Baffles



Forebay



Testing will continue with: (1) most feasible and effective design (MFE), (2) MFE + flocculant, and (3) bare soil. Findings are expected to guide the design and implementation of in-channel sediment basins for enhanced stormwater management during construction.

Completion expected Spring 2022

For more on this project and others like it, please follow:

