

Field Data Collection for Hydrogeosphere Model Validation

Former DuPont Waynesboro Site, Virginia
Area of Concern (AOC) 4

April 18, 2017

Agenda

- Objective
- Scope
- Site Selection
- Progress to Date
- Next Steps

Objective

- Collection of site-specific field data for the validation of the hydrogeosphere model
- Empirical datasets:
 - Soil properties
 - In-situ hydraulic properties
 - Hydraulic monitoring of surface and groundwater variation and interaction

Objective – Validation of Model Results

Modeled Surface Water Inundation Results for Different Hydraulic Conductivity Values

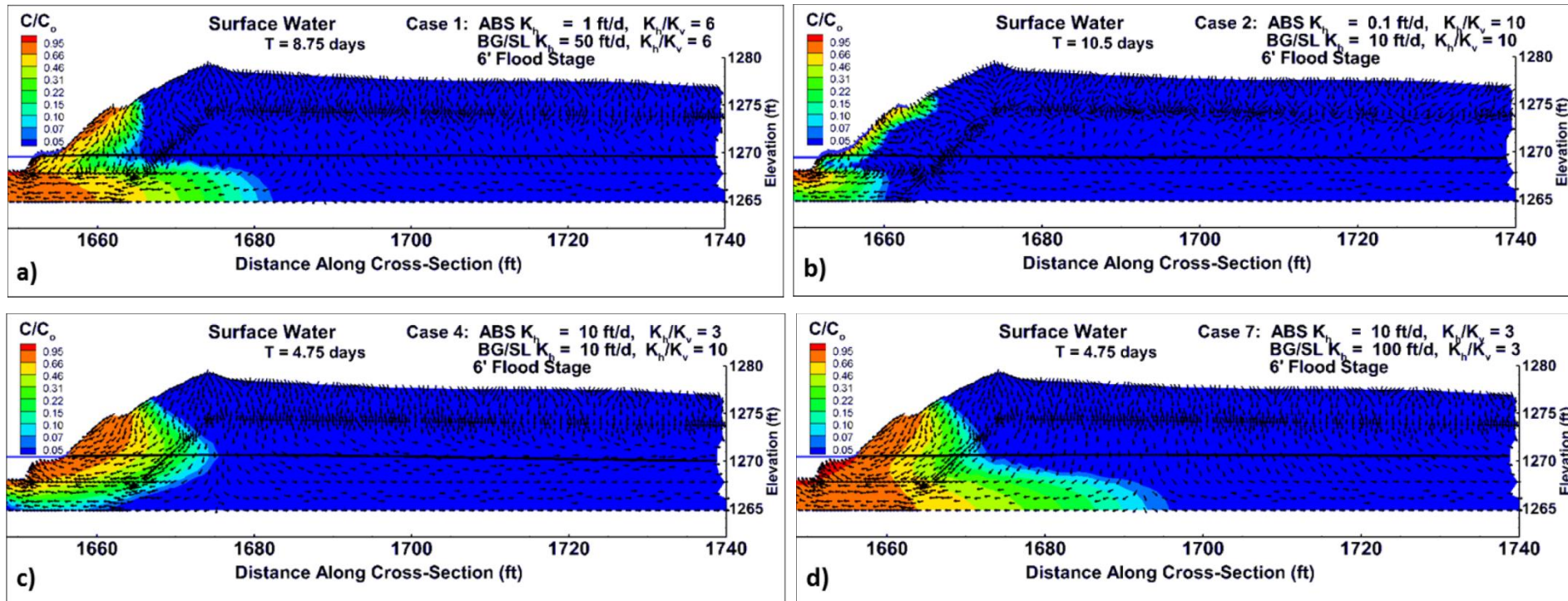
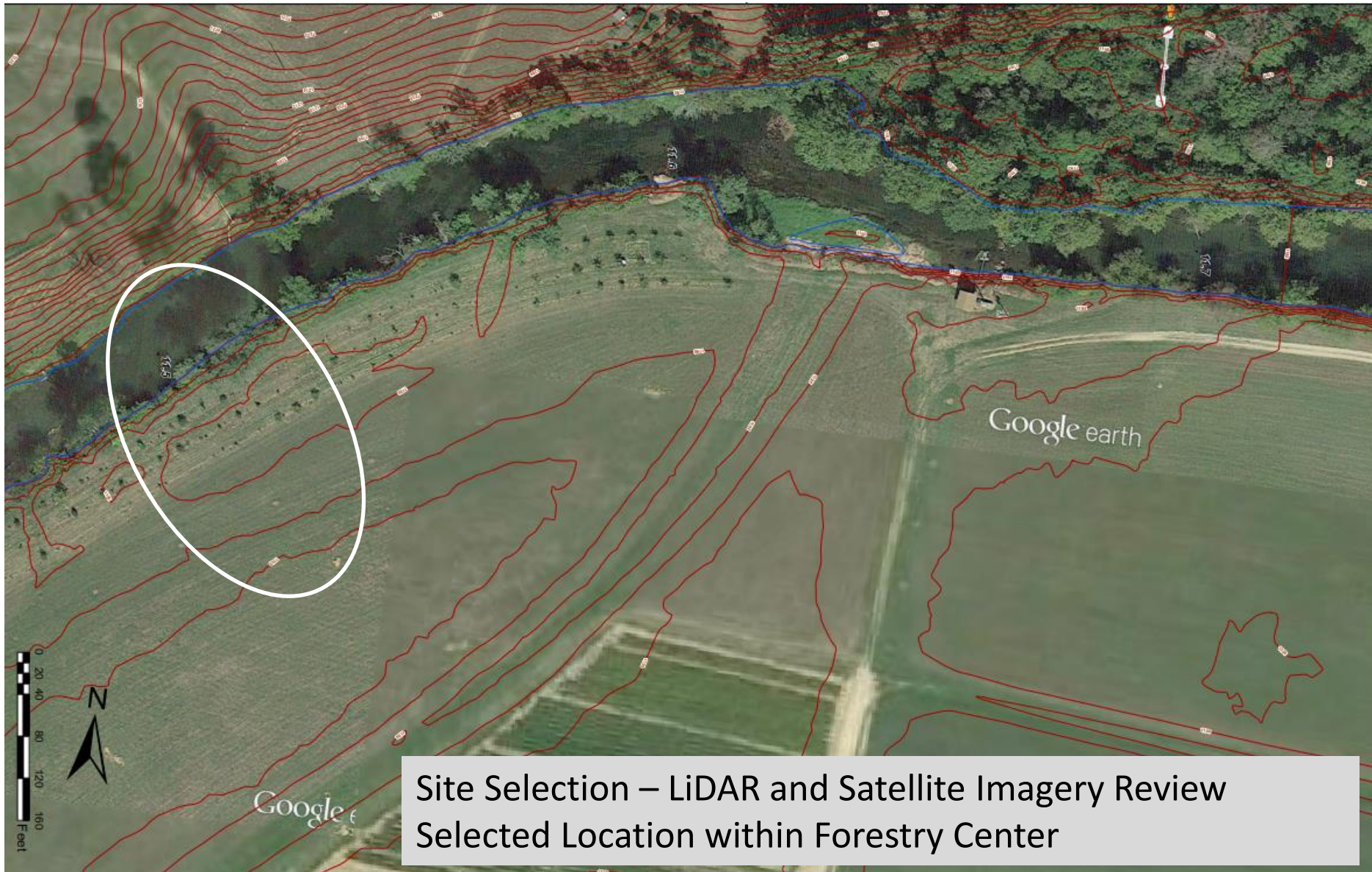


Figure 25. Snapshot of maximum surface water inundation into the bank for each case. a) Case 1 at $t = 8.75$ days; b) Case 2 at $t = 10.5$ days; c) Case 4 at $t = 4.75$ days; and, d) Case 7 at $t = 4.75$ days.

Scope of Work

1. Site Selection
2. Field Installation
3. Site Survey
 - Pre-Install: Topography, bathymetry, surface water level
 - Post-Install: location and casing reference data
4. Data Collection
5. Data Management and Periodic Updates

Site Selection



Site Selection — Location of Transect



- Proximity to South River
- Gradual slope for equipment access
- Streambank evidence of water level change

Approach – Boring Location and Well Placement

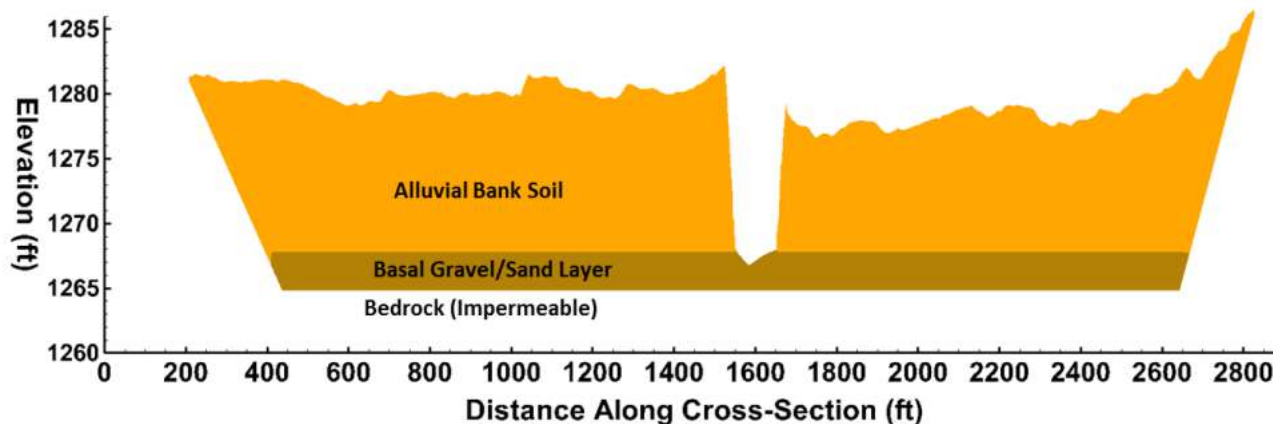


Figure 1. Conceptual model for a representative reach (RRM 0.22) along the South River, Virginia.

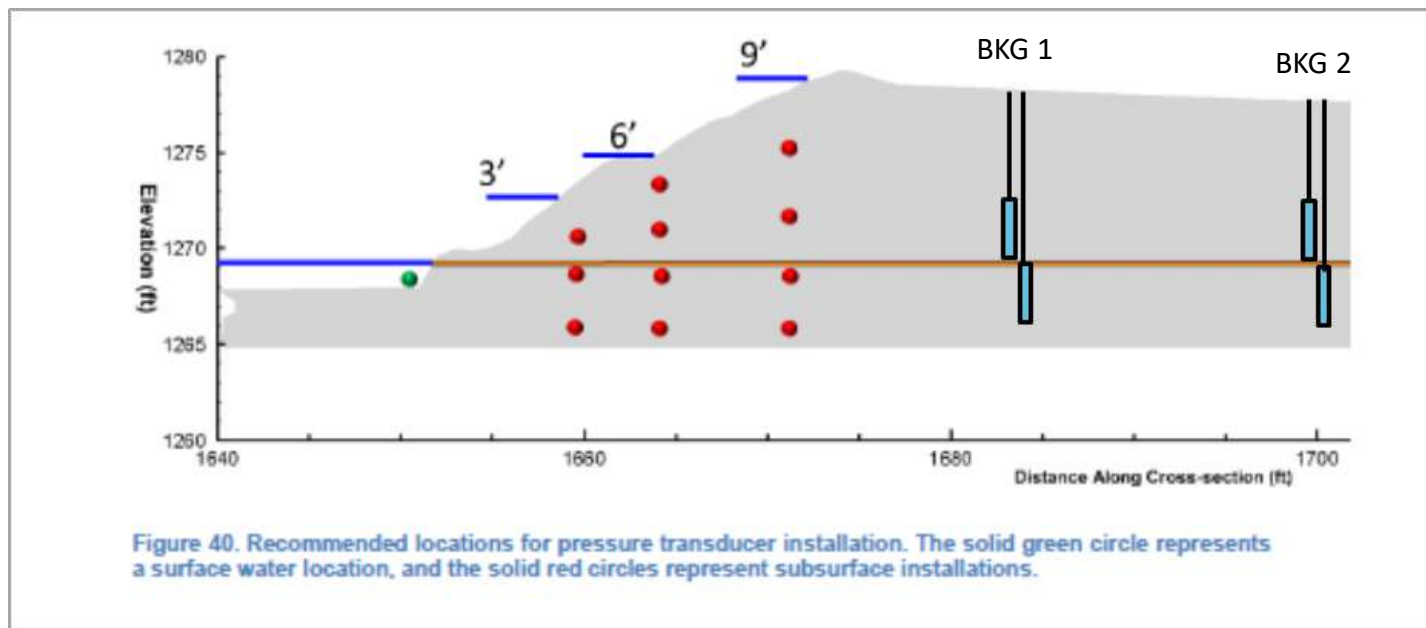
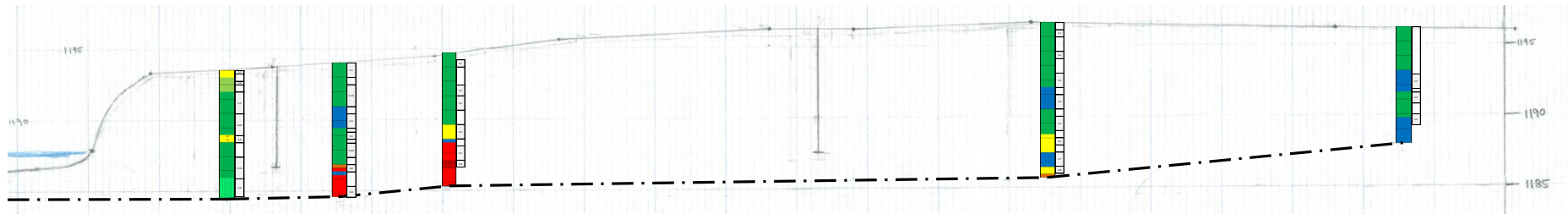
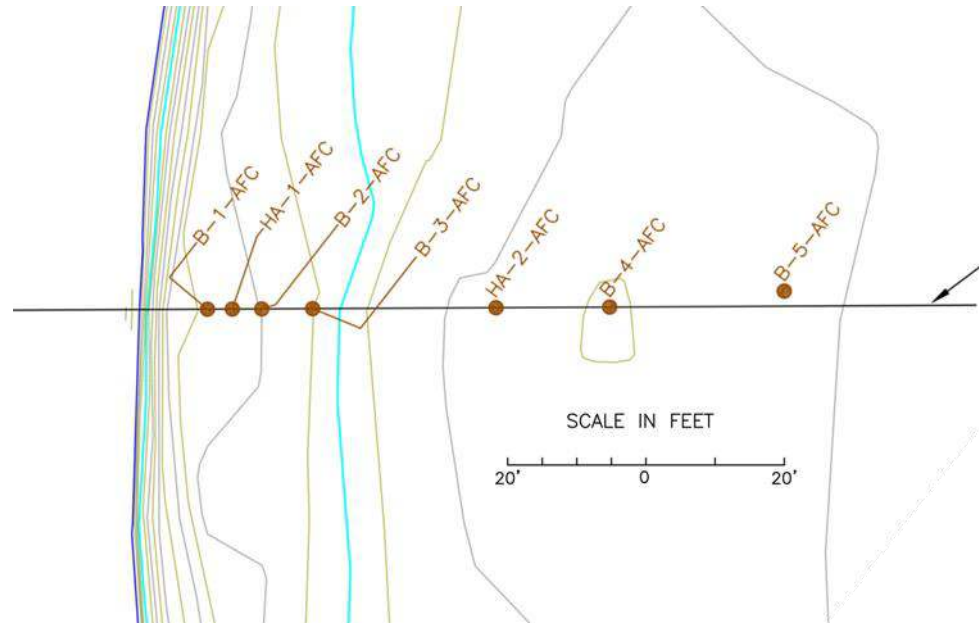
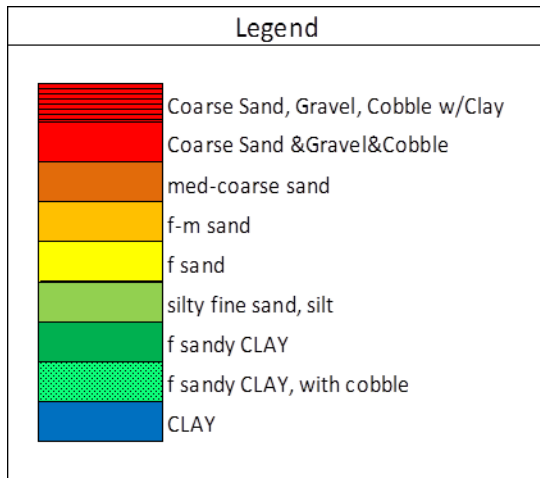


Figure 40. Recommended locations for pressure transducer installation. The solid green circle represents a surface water location, and the solid red circles represent subsurface installations.

Status Update

- Topographic and Bathymetric Survey
- Exploratory Boring Program and Well Installation
- Data Collection
 - Geotechnical
 - Surface and groundwater data

Borings



Cross-section

Well Installation

Orientation of Wells

A [shallowest] to D [deepest]

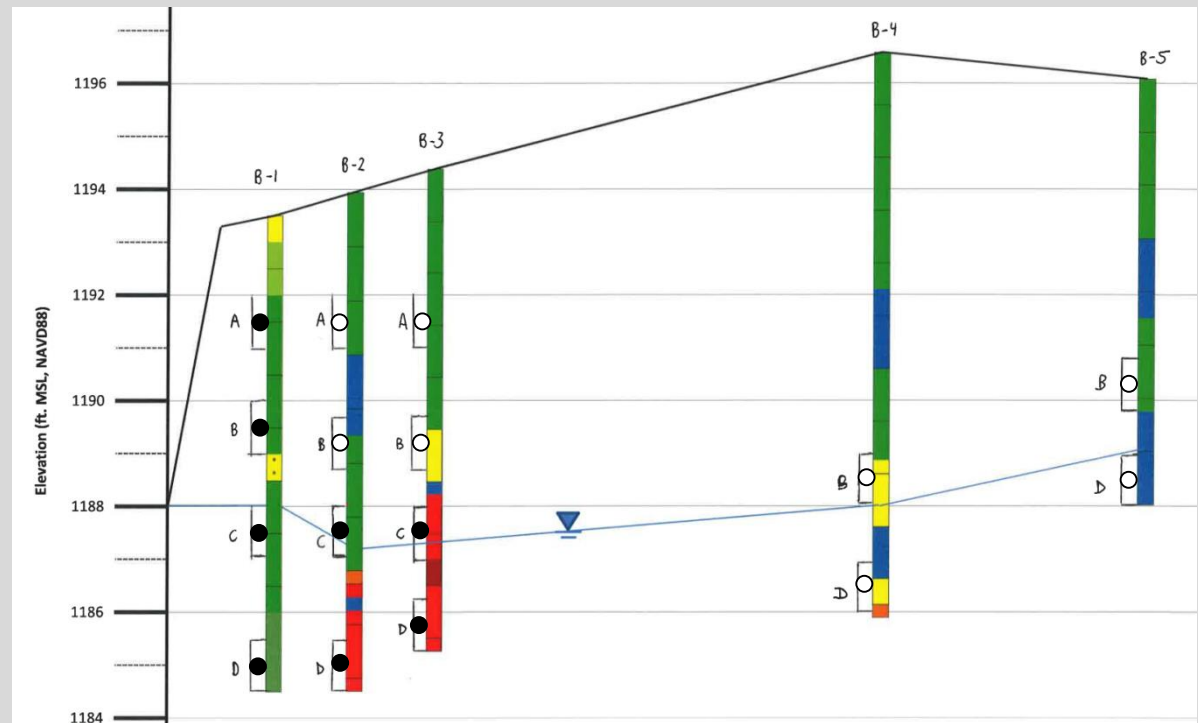


Monitoring Instrument Configuration

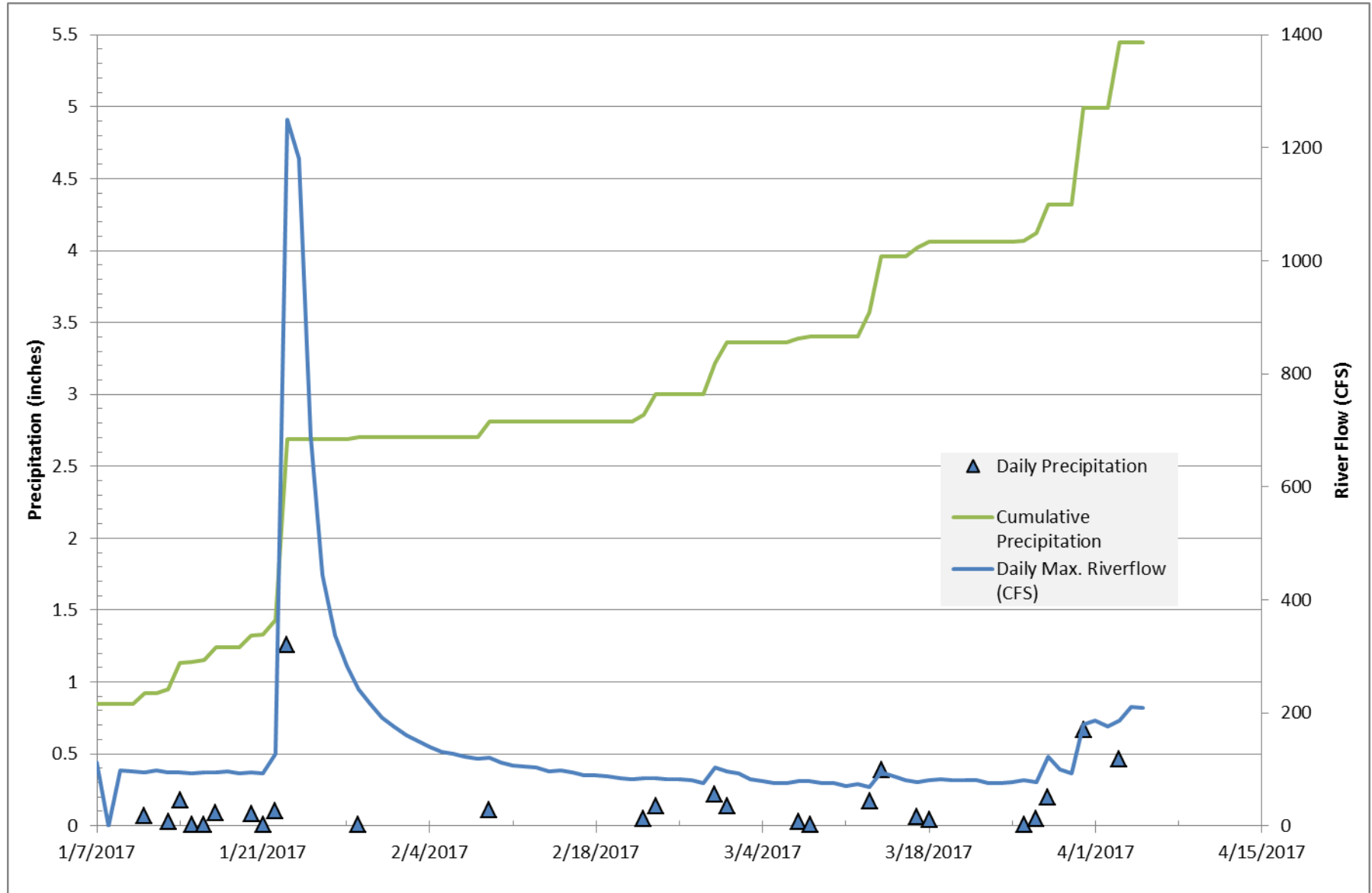
○ Temperature Pressure Transducer Only

● Conductivity, Temperature, Pressure Transducer

*Horizontal scale compressed



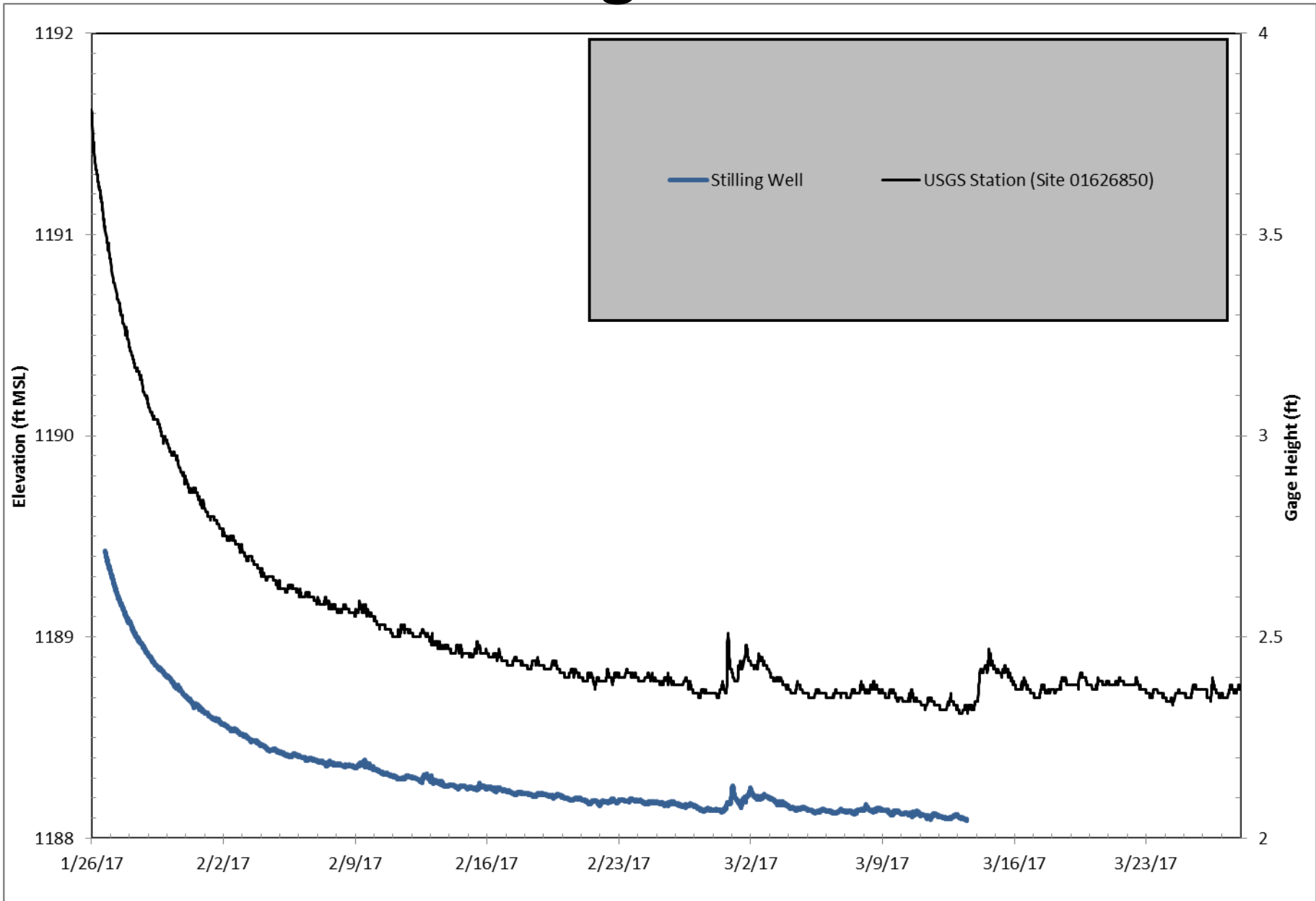
Precipitation & River Flow Data



Precipitation Data: Shenandoah Valley Regional Airport, wunderground.com

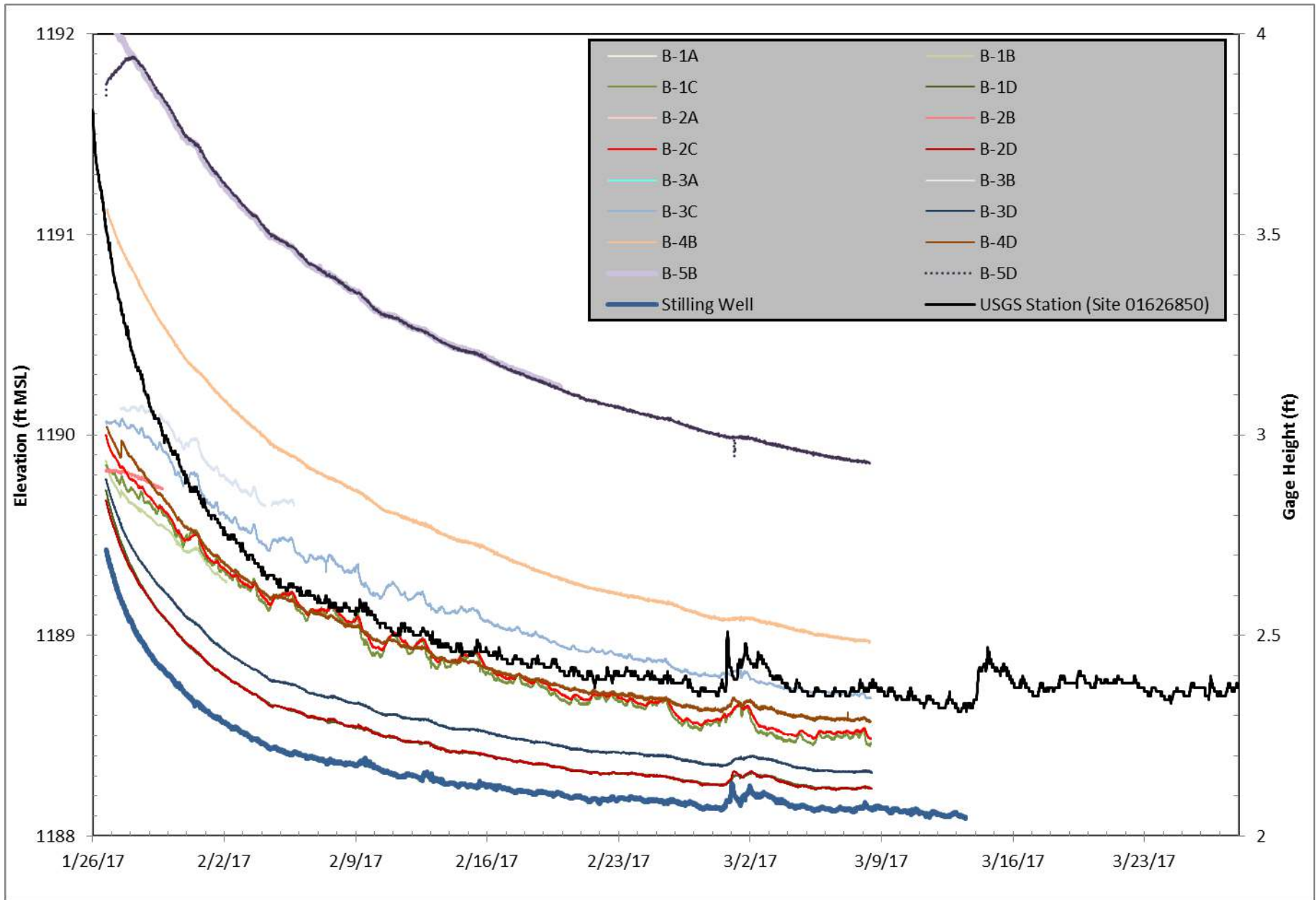
Streamflow Data: USGS Gauging Station 01626850 (South River Near Dooms, VA – Upriver)

River Flow & Stilling Well Data



Stilling Well Level (Elevation) & Dooks Station Gage Measurements (Gage Height)

Surface & Groundwater Response Data



Next Steps

- Monthly data download through May or June
- Slug testing on select deep wells
- Double ring infiltrometer (DRI)



Thank You

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