APPENDIX G: FIELD 5A AND 12 PIEZOMETERS

Summary

1. Piezometers and water sampling stations were installed in Fields 5a and 12 in these two fields, which are adjacent to Big Creek. The aim of these stations was to determine water table fluctuations and potential subsurface flow pathways, as a function of weather, Big Creek flow stage, and field management.
2. Piezometer functioning was problematic. While the belowground installation allowed routine field operations (i.e., grazing, slurry application, and cutting hay), we were not able to keep them watertight. Surface water seepage into the units, damaged data loggers with little data collected.
3. An additional unforeseen problem with data collection occurred when pasture height limited access to the stations, between May and October, due to landowner concerns of pastures damage and yield reductions.
4. Due to limited functioning of the piezometers, insufficient data was obtained to present any reliable findings in the Final Report.

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Piezometer and Monitoring Well Installation

Water-level sensors (Water Logger WL-15 units from Global Water) were installed on Fields 5a and 12 to continuously monitor the water table depth along two transects in Field 12 and in several strategic locations in Field 5a (Figure 1). The soil water-level sensors determine the depth at which soil is saturated with water (or the water-table depth) at four-hour intervals down to average depths of 6 to 7 feet, with the deepest being 9.7 feet below the surface, which is the depth where soil was underlain by a cherty or discontinuous layer (i.e., point of refusal).

At each site, two piezometers were also installed that allow collection of an in-situ soil water sample. The piezometers consist of 5-cm (2-inch) diameter Schedule 40 PVC pipe, which were slotted in the bottom 10 cm of the pipe to facilitate water flow. Sand was placed in the bottom of the hole and along the outside of the PVC pipe up to the top level of the slots in the pipe. Bentonite chips were placed above the sand along the outside of the PVC pipe to the soil surface to ensure no preferential

movement of water along the well casing. Piezometers were installed so that there was no piping or equipment above ground that could interfere with day-to-day farm operations on the field. Belowground construction of piezometers is depicted in Figures 2, 3, and 4.

Data will be downloaded from each unit using a laptop computer approximately once a month. One piezometer was located to collect water from just below the root zone (about 12 inches deep) and one from the deeper point of refusal, described above.

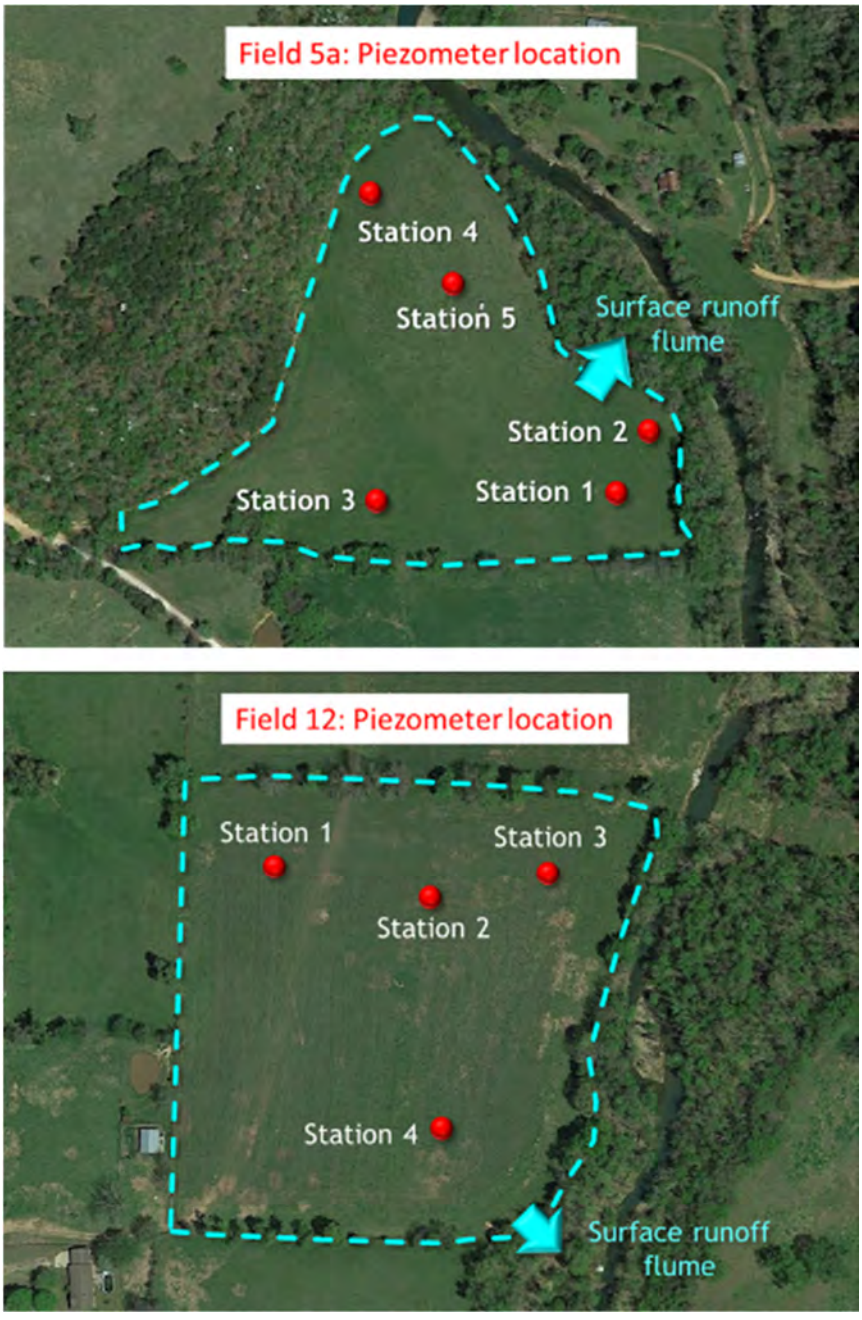

Figure 1. Location of piezometers in Fields 5a and 12.

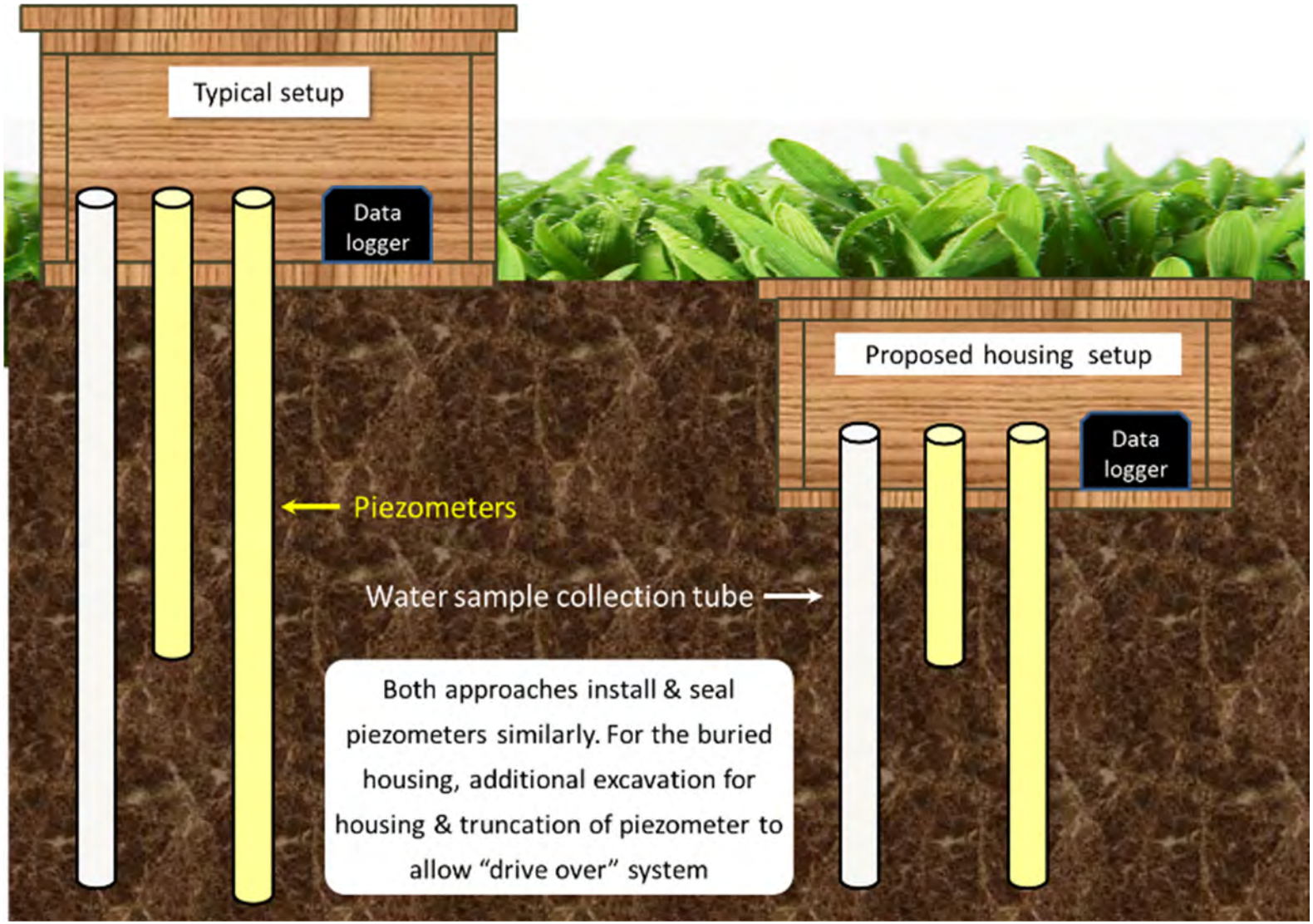

Figure 2. Schematic of belowground piezometer installation.

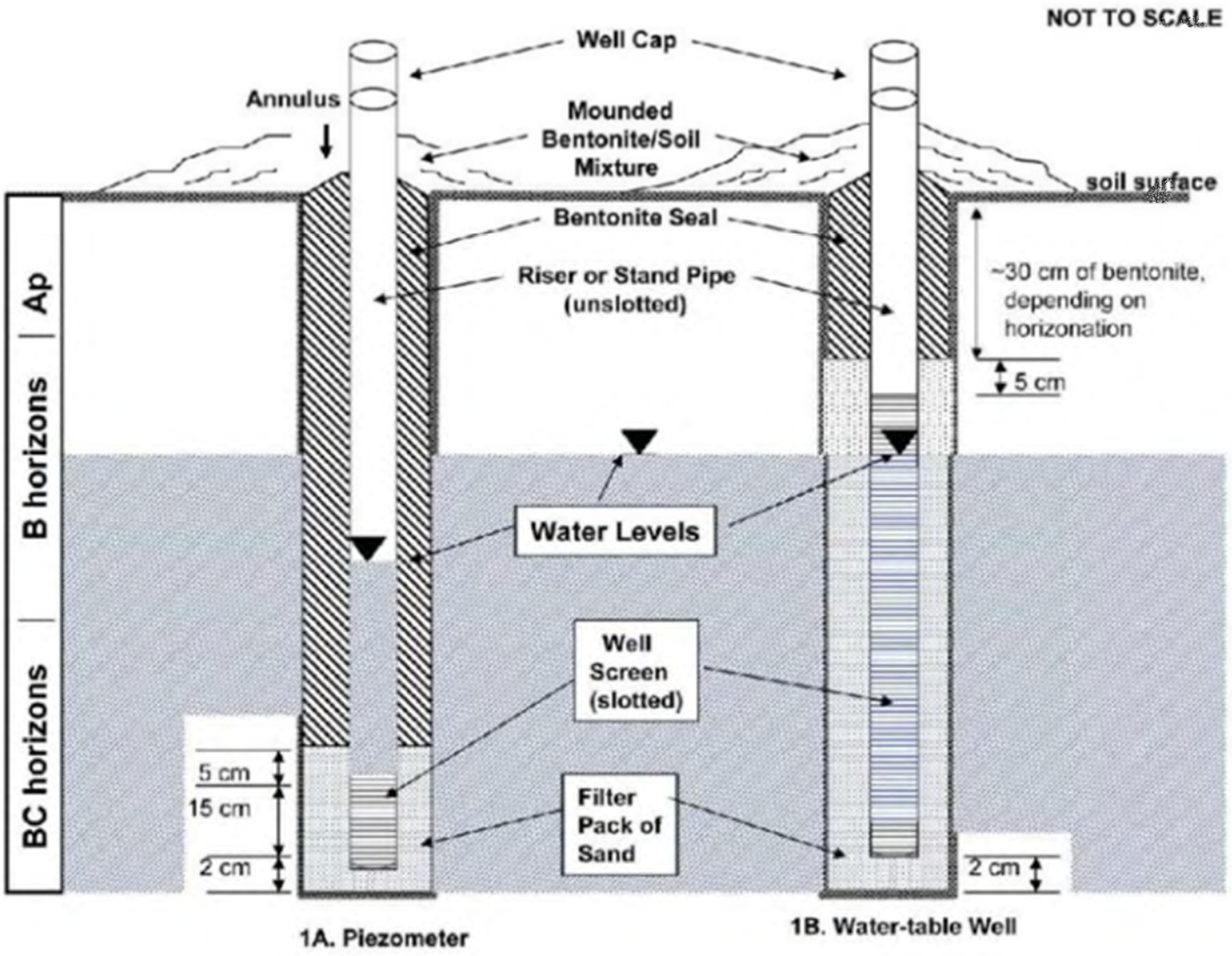

Figure 3. Standard installations for soil studies of (1A) a piezometer and (1B) a water-table well (see Sprecher, S.W. 2008. Installing monitoring wells in soils (Version 1.0). National Soil Survey Center, Natural Resources Conservation Service, USDA, Lincoln, NE).

Figure 4. Construction of belowground piezometer.