

# AquaBlok®

## Installation Summary

**Objective:** Tile Plug/Levee Rehabilitation

Location: Oak Harbor, Ohio

Setting: Wetland Dike/Levee

Project Status: Completed June 2010



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Photo 1. AquaBlok placement from a 50lb paper bag into a remnant agricultural field tile (flow from right to left through the earthen dike).

**Project Objective:** Stem the flow of water through a constructed earthen dike separating an inundated wetland environment from an adjacent non-inundated wet prairie environment.

**Background:** With countless miles of earthen dike walls separating tens of thousands of acres of wetlands, control of water is crucial to the broader management of these critical habitats. In many areas of the U.S. (and beyond), wetlands were converted to agricultural production through a complex labyrinth of subsurface drainage. By disabling these drainage systems, farm fields can revert back to wetlands as the hydrology returns. Ceramic and/or its more modern PVC drain tiles are typically buried several feet below grade and are spaced relative to each other based on topography. Sometimes the spacing is in regular intervals (e.g. every 25 or 50 feet) and sometimes the spacing is random. Once a tile is located (often a challenge in its own right) and removed or broken (often with an excavator bucket), the void space is typically filled by compacting surrounding soils. Over time, head pressure from higher ground and/or the intact portions of the tile system can weaken the plug where the tile was disabled. The result can range from a slow seep to a significant flow.

**Technical Challenges:** Addressing a failed tile plug has typically required the use of equipment (e.g. an excavator), clean/tight borrow clay, and often amendment materials (e.g. granular bentonite). A trench is usually cut perpendicular to each remnant tile, and a thick (e.g. 2- to 4-foot) plug of clay is compacted to intercept the flow of water. Not only is this approach labor and time consuming, it also requires a reliable source of workable clayey soil, reasonable access to the site, and a great deal of excavator time – particularly if the problem is persistent along a dike. Conventional solutions to plug flowing tiles can be even more problematic, requiring pumping or water diversion until a seal can be achieved.

**AquaBlok Solution:** 250lbs (five, 50lb bags) of AquaBlok® 2080FW#8 (PONDSEAL™) were hand-placed into the upstream side of the remnant tile cavity. Because the material self-seals when hydrated, no mechanical compaction was needed. However, material was pushed by hand into the void until no more product could be added. Care was taken to remove any loose soil surrounding the opening so that the AquaBlok could “key” into stable substrate.

**Equipment Used:** Quad for material delivery to application site; material poured by hand from original packaging.

**Timeline:** The AquaBlok plug was placed in a matter of 15 minutes or less. Full hydration likely took up to 24 hours.

**Results:** A visual reduction in flow through the berm could be observed almost immediately. The flow slowed even more over the ~1 hour that field personnel remained on the berm. By the following morning (20 hours post-application), there was no sign of water flow. The low lying area where water once passed through the berm (Photos 3 and 7) ultimately dried and has been observed only to be moist during subsequent visits to the site. The plug has remained stable an effective through time.



Photo 2. A top-down perspective of the breach in the earthen berm separating an inundated wetland (left) from an adjacent non-inundated wet prairie environment at drawdown (right).



Photo 3. A top-down perspective of the water upwelling on the “back side” of the earthen berm – in the environment which was intended to be moist (not inundated).



Photo 4. After closer inspection, the pathway (which measured exactly 24” wide) was determined to be the result of an improperly re-compacted trench dug to remove a remnant field tile.



Photo 5. Manual addition of AquaBlok from a 50lb bag.



Photo 6. Active hydration of AquaBlok (five bags of 250lbs total) following product placement. Note technician marking location with GPS to track performance through time.



Photo 7. A comparable perspective to Photo 3 approximately 20 minutes after the placement of AquaBlok demonstrating the lack of upwelling (i.e. water loss) into the adjacent moist wetland unit.



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