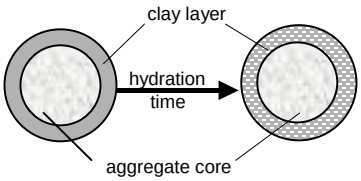
Introduction

AquaBlok®

Technology Overview

General Description

AquaBlok® is a patented, composite-aggregate technology resembling small stones and typically comprised of a dense aggregate core, clay or clay-sized materials, and polymers (Figure 1). For typical freshwater product formulations, AquaBlok's clay (sealant) component consists largely of Bentonite clay. However, other clay minerals or clay-sized materials can be incorporated to meet project-specific needs, including product use in saline environments. Other technology parameters (particle size, relative clay content, etc.) can also be modified as appropriate.



not to scale

Figure 1. Configuration of Typical AquaBlok Particle.

General Functional Attributes

AquaBlok particles expand when hydrated, with the degree of net vertical expansion determined largely by the formulation, application thickness, and salinity of the hydrating water. When a mass of particles is hydrated, the mass transforms into a continuous and relatively soft body of material. Once developed, the hydrated AquaBlok material can act as an effective physical, hydraulic, and chemical environmental barrier by virtue of its relatively cohesive and homogeneous character, low permeability to water, and chemically active (sorptive) nature.

AquaBlok can also provide substrate for wetland vegetation and habitat for macroinvertebrate organisms, particularly when additional organic material is provided, either as part of the product formulation or as a surficial dressing. The AquaBlok technology can also deliver plant seeds to a targeted area to facilitate wetland restoration (see discussions related to the SubmerSeed® technology, as well as chemical reagents for *in situ* treatment of environmental contaminants.

Photograph 1. Product applied using barge-based conveyor.

Typical Applications

For many projects, AquaBlok use generally involves applying dry masses of the product through water and across the surface of contaminated sediments. In a matter of days, a homogeneous and relatively cohesive, low-permeability cap, or barrier, is formed between contaminated sediments and the overlying water column and its inhabitants. Barrier thickness will depend on a number of factors, including: type of formation, water depth and salinity, application thickness, number of lifts applied, and sediment characteristics.

AquaBlok can also be used as a hydraulic/chemical barrier to the movements of water- or sediment borne contaminants into underlying groundwater resources, or to minimize leaching losses of water from reservoirs or wastewater discharge basins.

Integration with Other Remedial Approaches

Effective management of contaminated sediments may involve remedial capping exclusively or an integration of capping with other management technologies like dredging and/or monitored natural recovery. *In situ* capping may also be integrated with *in situ* sediment treatment technologies to affect mass reduction of encapsulated contaminants.

Ecosystem Applicability

AquaBlok can be applied to impacted wetland and deepwater aquatic ecosystems characterized by either freshwater or saline (including brackish) conditions.

Methods of Installation

AquaBlok can be handled and installed using commonly available equipment and technologies, including conveyors (e.g. Photograph 1), excavators, cranes with clamshell buckets, and even helicopters.

Other techniques could also be used to effectively install AquaBlok based sediment caps. The most appropriate installation methods(s) will depend on a variety of factors including: water or shoreline access, bank slope, surface water characteristics and ecology, size of the project area, and relative costs.

Costs

Costs for implementing an AquaBlok-based capping remedy will vary widely depending on a number of project- and site-related factors that will collectively dictate the most appropriate AquaBlok formulation, cap design, and method for cap installation. Project costs will also depend on whether material is packaged and transported to the project site, or whether it is manufactured at or near the site. Costs associated with project planning and management; preliminary laboratory studies (if required); cap design; permitting; construction QC; long-term performance and monitoring; and cap maintenance should also be considered.

If you think the AquaBlok composite particle system could be of use in your remediation projects, call us. We will be happy to discuss your project with you, and help determine how the AquaBlok technology could integrate into a cost-effective solution.

AquaBlok® Composite Particle System

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