

Erosion Control Tubes: Special Considerations

by Eric Galloway

My experiences on the use of erosion control tubes, particularly at Department of Energy (DOE)/ Department of Defense (DOD) and other hazardous waste sites.

As a person that does storm water inspections both at construction and environmental remediation sites at DOD and DOE facilities, I want to point out some of the inherent problems that have to be taken into consideration while using erosion control tubes or other “like” organic or synthetic Best Management Practices (BMP) at hazardous waste sites. Don’t get me wrong, as a former construction worker and a current site inspector (CISEC #101), I feel that the use of erosion control tubes, filter logs or wattles for construction control is one the most cost effective and easily maintained BMP in the industry today. But many do not take the necessary steps when dealing with these devices in the post-construction phase of a project.

Most of the projects where disposal pathway control issues come into question are those at long-term environmental remediation sites such as U.S. National Laboratories or other old hazardous waste disposal sites. This question first came to mind while doing storm water inspections at Technical Area 21 (TA-21) at Los Alamos National Laboratory in Los Alamos, New Mexico. TA-21 is the past production area used during the Manhattan Project where nuclear and other materials were disposed of during the production of the Hiroshima and Nagasaki bombs, also known as “Fat-Man and Little Boy”. Many of these sites are currently being remediated to a residential use standard and will be transferred to the County of Los Alamos as part of a large land transfer project between the Laboratory and the County. This semi-arid region is located adjacent to a mix of residential and commercial holdings and has many Solid Waste

Management Areas (SWMUs) which contain contaminants that range from radioactive materials to solvents, heavy metals, high explosives and tools that were used during the original bomb manufacturing process.

THE GOOD:

Erosion control tubes, I believe, have shown to be a huge improvement over the use of silt fence and hay bales for many construction sediment control practices such as parameter control, outlet protection, interior site control, site maneuverability aspects, curb inlet protection, slope length reduction and/or other storm water diversion structures, especially in

composted materials, differing tube sizes and the addition of flocculants and/or seed mixtures within the tubes or wattles has led to a myriad of uses including soil augmentation. They have both a high visually intrinsic value and are less invasive, especially when used in urban and other “visually important” sites. They can be sliced open and graded into the soil as an soil enhancement or amendment or even left as is to be used as a growth medium for vegetative establishment.

Proper Installation

The effectiveness of erosion control tubes or wattles depends much upon its installation and maintenance. Tubes must



Straw wattles used at a DOE site showing deposition of sediment and flattening from “vampire” staking.

areas where trenching and/or access is a major problem or concern. In addition, erosion control tubes provide needed stability when used as a drainage check-dam or other flow retention device(s) in areas where concentrated flows would usually over power other BMPs. These tubes can be made from a variety of materials that range from simple straw to a combination of straw, either loose or “crimped”, wood, mulch, coconut or “coir” fabric or fibers or other manmade fibers. The use of

be properly staked in using centered (vampire staking) with the stake being driven directly through the center of the wattle at a 45 degree angle with the stakes pointing upstream or alternating side-by-side staking with wire, string or twine strung from one stake to the next with the string being used to wrap over the device in order to hold the tube in place. In addition, most erosion control tubes, when used in-place of a silt fence or where flows may be concentrated must be

trenched or “keyed in” in order to prevent under-cutting or wattle movement. Personally, I like to use the side-by-side wire method for my erosion control tubes because I find that it avoids “flattening” which can lead to an increase in blowouts or over-topping. Erosion control tubes must be properly sited, either perpendicular to the flow in cases where they are needed for detention or dispersion of flow or for sediment capture or filtering. If used for this purpose, all the ends are to be abutted at least 6 inches and staked upstream toward the direction of the flow preferably in a “smile face” or “J” hook configuration or placed vertically to the slope or contour to break-up long slope runs. Erosion control tubes can also be easily replaced or beefed up by layering or can also be laid in a staggered configuration to maximize flow length and sediment deposition.

THE BAD:

Due to the kind of sites that I am charged with inspecting, I see a problem often overlooked. What goes in must come out! Stop and think! If these



Straw wattles used at a DOE environmental remediation site (where hazardous and radioactive waste was present) showing degradation and the possibility for a contamination release.

erosion control tubes have such a good ability to filter and capture sediment, consider what material may remain in the tube after it is used that may be part of a hazard waste site, remediation site, solid waste site or radiological contaminated

site and it's potential for a release. These erosion control tubes not only have the potential to become contaminated but can also concentrate contaminants or act as a “sink” which may lead to future releases and/or deposition to the environment.

S & S Seeds?

Earthsaver?

Often times when I suggest that a facility test the erosion control tubes before they are either disposed of, left in place and intact to eventually degrade, or even sliced open to allow for dispersion of grading into the soil, all I get are blank or often times, irate looks. I ask, "Is this a Hazardous Waste?" You would be surprised how many times I get the answer that they do not know or it has not occurred to them to consider it as such.

Studies need to be done in order to

document what types of contaminants are most readily captured and held by the different varieties of erosion control tubes currently on the market and in what potential concentrations. Are heavy metals or hydrocarbons the primary contaminant of concern or can these BMPs serve as a potential "sink" for a combination of contaminants that could potentially be cause of future release? What materials are best used at sites where this may be a concern? How fast do these products

leach out if left in place? Is radioactive material a potential problem? Should they be tested as part of the Notice of Termination (NOT) process or should they always be treated and disposed of as a hazardous waste? Is the potential for contaminate accumulation decreased or increased when these BMPs are used in combination with other BMPs? Are there alternatives that should be used when dealing with hazard waste sites, remediation sites, solid waste sites or radiological contaminated sites? Should they be considered in the original planning phase of a project as a potential waste? Do heavy rains pose a potential standards threat due to the flushing action of large amounts of water passing or being filtered through the wattle or tube? These are just a few of the questions that need to be posed when looking at using this type of product on contaminated sites and their potential for future contamination occurrences.

Analysis of contaminated site tubes should be a priority when designing a sediment control plan and proper disposal needs to be considered from day one when working or seeking a Notice of Intent (NOI) and eventually a NOT at a site that may have a hazard waste, certain solid wastes or radiological contaminated wastes. Proper disposal of all materials is a requirement of many Federal and State laws including RCRA, CERCLA, and the CWA, and SDWA and many state hazardous and solid waste regulations.

There are many projects where erosion control tubes are the most effective BMP to control sediment on the construction site but remember, especially when dealing with hazardous waste sites, what goes in must come out so plan ahead and budget for it! **L&W**

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Firestone?