



## SELECTING THE BEST OPTION

**So many options to choose from...**

Does having multiple options make you feel empowered or overwhelmed? If you feel like you can take on the world when you have multiple options to choose from, the good news is that there are a variety of storm water treatment options available to choose from and we will go over a few of the options for you to consider. However, if you feel overwhelmed with all the options and just need a guiding hand to help you navigate the pros and cons of each option, don't worry, we've got you covered. While it may seem daunting to try to compute the best treatment options available for your facility that will work both here and now as well as many years into the future, it's really just about narrowing it down to the right compliance option for your facility. There are a lot of pros and cons to each treatment option available, and not all of the options are one-size-fits-all. So, in this month's edition of **The Rain Events**, we are going to be outlining the pros and cons of a variety of treatment options for you to consider. This list is not exhaustive, so use this article as a springboard to do more research of your own.

### **Option #1: Compost**

Compost, a natural storm water treatment option has proven itself to be very effective in pollutant mitigation. Compost treatment options come in many different forms – from filter socks to filtration totes, this natural resource is very versatile. “Compost filter socks have been extensively researched and evaluated at the USDA Agricultural Research Service (ARS) and universities. Research literature has shown that this management practice can physically filter fine and coarse sediment and chemically filter soluble pollutants from stormwater. A USDA ARS study showed that *compost filter socks can remove 65 percent of clay and 66 percent of silt particulates; 74 percent of total coliform bacteria and 75 percent of E. coli; 37 percent to 72 percent of Cd, Cr, Cu, Ni, Pb, and Zn; 99 percent of diesel fuel; 84 percent of motor oil; 43 percent of gasoline; 17 percent of ammonium-N; and 11 percent of nitrate-N from stormwater runoff.*”<sup>1</sup> Talk about an effective and affordable treatment option. However, on the downside, if not maintained, the compost treatment device can get

overwhelmed by sediment and pollutants and no longer be as effective. Maintaining compost treatment devices to ensure pollutant overload is not occurring, and being sure to refresh worn out treatment devices (filter socks, compost totes, etc.) should be done on a regular basis. And while this might not be a super costly prognosis, it's going to require forethought, scheduling, and follow through.

### **Option #2: Vaults & French Drains**

What do both of these treatment options share in common? Removing surface water and conveying it underground before dispersing of it by a variety of means. Ranging from pricey to semi-expensive, these two treatment options are great for a facility looking to minimize or completely reduce discharges. By capturing the surface flow and channeling it to a vault system or allowing infiltration into the ground through seepage, the facility implementing either or both of these two options can be looking at a great space conserving and discharge reducing option

for a facility which doesn't have much room for other full capture options. “Storm water vaults are underground cast structures designed to hold large amounts of excess stormwater runoff from a developed area. They allow for the settling out of fine sediments and are designed for flow control and the conveyance of storm water during large storm events. There are several different types of storm vaults, including: 1) detention vaults 2) wet vaults (hold a permanent pool of water), and 3) infiltration vaults (which have holes or are bottomless allowing for infiltration onsite).”<sup>2</sup> While some vaults do not have treatment options available and are just a temporary storage space for water before discharge, other types of vaults include filters that help remove pollutants from the captured storm water before being reused or discharged. However, storm water vaults need to be frequently and thoroughly maintained to make sure they don't get clogged with debris and stop working or overflow. If maintained regularly, this may not be a huge undertaking, but if left unattended too long, it could require a lot of manhours and money or maybe even a new

system.

“A French drain (also called a weeping tile, trench drain, filter drain, blind drain, rubble drain, rock drain, drain tile, perimeter drain, land drain, French ditch, sub-surface drain, sub-soil drain, or agricultural drain) is a trench filled with gravel or rock, or both, with or without a perforated pipe that redirects surface water and groundwater away from an area. The perforated pipe is called a weeping tile (also called a drain tile or perimeter tile). When the pipe is draining, it “weeps”, or exudes liquids.”<sup>3</sup> A French drain is a great option for reducing surface flow/ discharges and infiltrating water. However, these infiltration systems are prone to clog overtime so will need continued maintenance and possible excavation to keep it effective.

### Option #3: Vegetation & Infiltration

There are certain types of plants that offer great natural remediation benefits for storm water. Vegetation in the form of grassy swales, aquatic pond plants, landscaped areas, and vegetated retention basins have the capacity to filter and uptake the pollutants out of storm water before the water infiltrates through the soil and back into the groundwater basin. The soil itself also helps capture and remove pollutants from the water as well as acts as a sponge to any sediment that may be present. Plus, this treatment option is relatively low-maintenance and practically takes care of itself. Not to mention the bonus wildlife habitat you can create depending on what type of vegetation/infiltration option you choose. However, the only real major downside of this not-to-expensive treatment option is the space limitation most facilities have. A lot of space is required for this treatment option to be effective. If you have limited space but want to dedicate some of it to this treatment option, that’s great! But know that it will only be one of several options



[Watch this SWAW workshop that highlights phytoremediation.](#)

you are going to need to implement. Plus, there are some pollutants which may not be filtered out completely. Whether it’s a vegetated swale, a water treatment marsh, or LID rain gardens, space is going to be the main downside of this option.



### Option #4: Ponds

In our opinion, one of the best options available to industrial facilities for storm water treatment is a capture and reuse system or pond. When designed to the right specifications, these ponds have the potential to hold most storm season rainfall without discharging. Working with a PE to design your pond to hold a 100-year storm (or something as close to that as feasible) may be an expensive option at first, but if you have the funding and space to create a pond on site (even a small one), there is literally no better option in our opinion than this. If appropriately sized, you may even qualify for a NONA since you may have no discharges even during really wet seasons. The downside to this treatment option, however, is the space and budget limitations. A lot of facilities can’t manage to have a pond on site, but if you can, seriously consider this option.

### Option #5: Filtration Media

End of line filtration devices using a variety of filter media is a great and affordable option. Different filter media can remove things like metals, pH, nutrients, sediment, and etc. Whether it’s totes of filtration media which water passes through before discharging, or a layer of redwood bark surrounded by compost filter socks to reduce pH and filter out sediments and other pollutants, there are a lot of creative ways to filter water before it leaves your site. Do

your research on different types of filtration media and the beneficial uses it may bring to the table in reducing a certain pollutant of concern. However, the downside of this treatment option is that while it may be pretty cost effective in materials and relatively conservative in space consumption, it requires a lot of maintenance hours to keep it in good filtering condition. This is not a treatment option you install and walk away for a while. The filtration media will need to be refreshed and excessive sediment removed periodically.

### Option #6: First Line of Defense Treatment

If you can’t afford a fancy treatment system, then at the very least, don’t underestimate the power of good housekeeping and first line of defense BMPs. Make sure your facility grounds are swept and kept free of excessive loose sediment. Run a magnet over paved surfaces to pick up metal shards which might spike your storm water samples. Install effective drain inlet protection, drain insert bags, compost socks, fiber rolls, and more. And not only install these treatment devices but properly maintain and replace them frequently. Every little bit you can do matters and will help protect your site from having unchecked and unwanted NAL exceedances. We get it, not everyone has deep pockets or lots of extra space for fancy treatment options, so work with what you have to wisely protect your facility from costly exceedances.

At the end of the day, there’s no one size fits all treatment option. Using creativity, research, and knowledge of your facility’s pollutants of concern, size and space availability, as well as the future plans for the facility, choose the treatment option that works best for you.

<sup>1</sup><https://www.nrcs.usda.gov/sites/default/files/2022-10/Agronomy-Technical-Note-4.pdf>

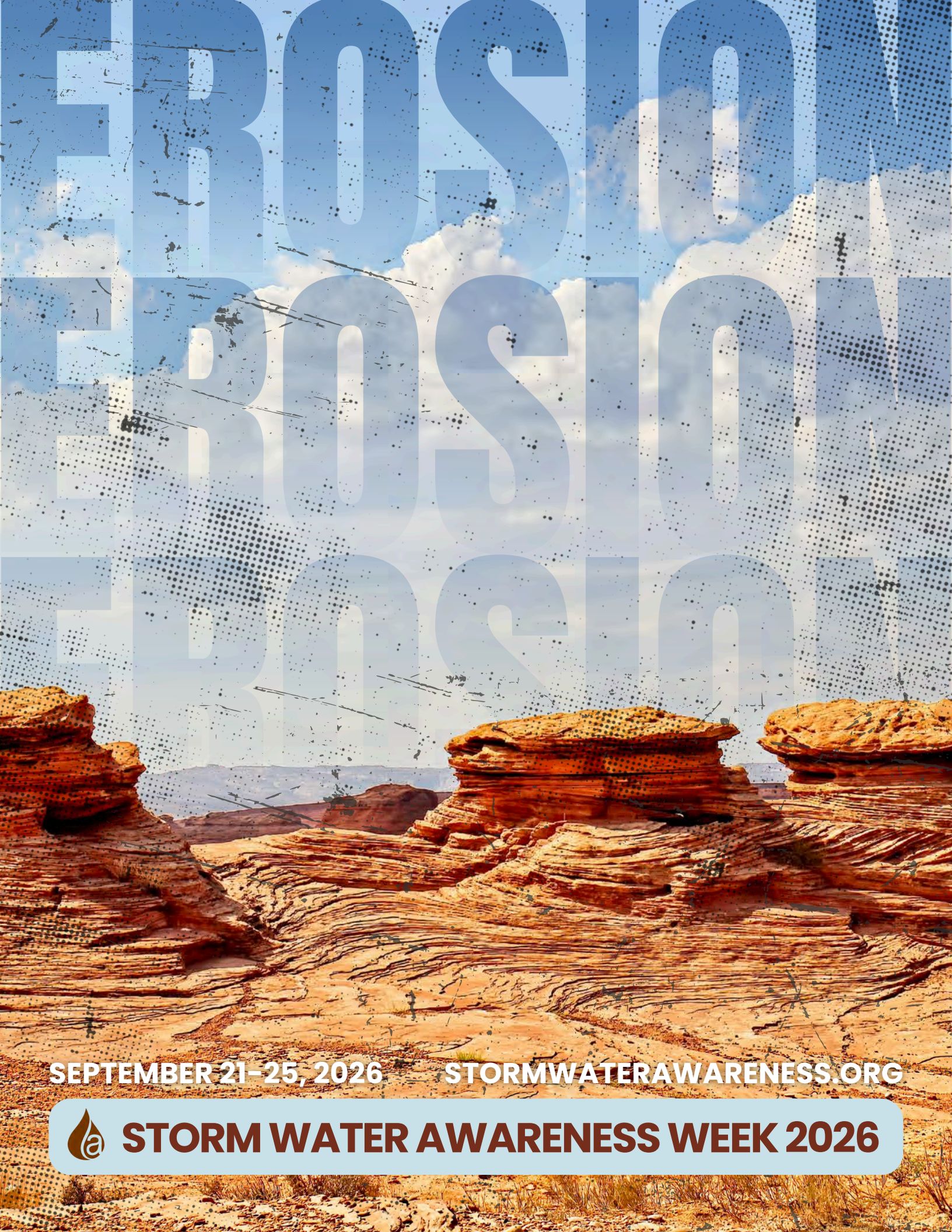
<sup>2</sup><https://fabco-industries.com/uncategorized/stormwater-vault/>

<sup>3</sup>[https://en.wikipedia.org/wiki/French\\_drain](https://en.wikipedia.org/wiki/French_drain)

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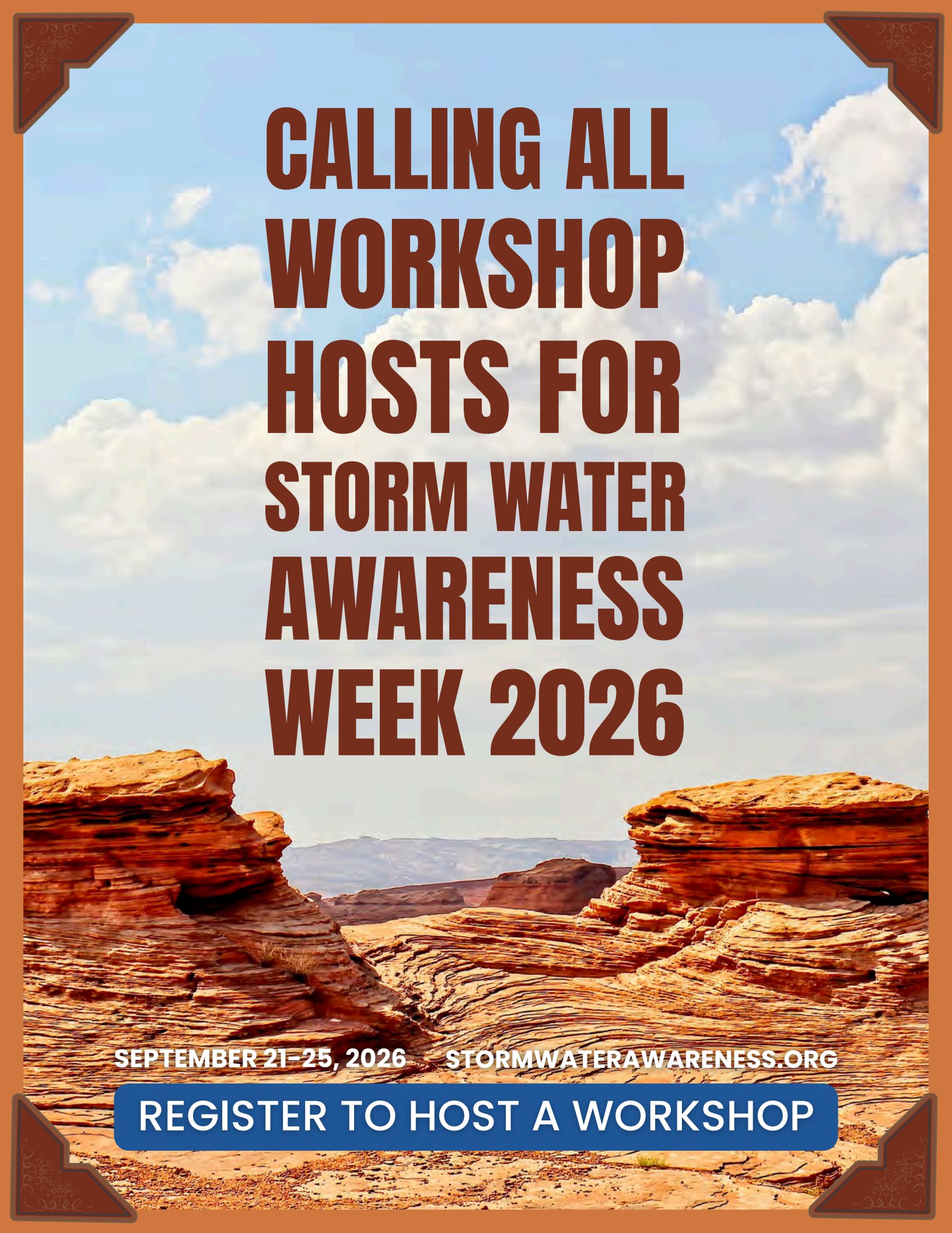


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- James A. Musick Facility (Compost Application Demonstration)
- UC ANR South Coast Research and Extension Center (REC) Tour
- OC Waste and Recycling's Compost Facility Tour



# *Storm Water Contest...*

Each month, we invite our readers to participate in a contest to test their knowledge of the Industrial General Permit and show their storm water compliance program. We enter all submittals to our monthly newsletter question into a drawing and one person is selected at random to receive a \$25 gift card.

## *What is the deadline for the Annual Report?*

Congratulations to Karina who answered, *"the answer is my birthday (a.k.a. July 15). That makes it easy to remember."* We wish you a happy early birthday, and we hope you enjoy your next refreshing treat from Starbucks!

# *...This Month's Contest*

*If you can make this treatment option work, which is the best option in the opinion of The Rain Events newsletter?*

We need industrial storm water sleuths to help us with this month's question. Submit your answers by Friday, June 5th. Email your answer to [jteravskis@wgr-sw.com](mailto:jteravskis@wgr-sw.com). One winner will be selected by a random drawing to receive a \$25 gift card to Salt & Straw.

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