



TNSA Board

President: Andy Best
abest@johnsoncitytn.org

President-Elect: Don Green
Green_d@chattanooga.gov

Vice President: Crystal Piper
CPiper@HamiltonTN.gov

Treasurer: Jason Scott
jason.scott@townoffarragut.org

Secretary: John Charlson
john.charlson@tennessee.edu

Regional Chairs

Southeast Tennessee:
Leah Crisp
leahc@hamiltontn.gov

Northeast Tennessee:
Dan Wankel
DanWankel@kingsporttn.gov

East Tennessee:
Parci Gibson
Parci.Gibson@knoxcounty.org

Middle Tennessee:
Amy Murray
amurray@cityofgoodlettsville.org

West Tennessee:
TBD—Vacant

Executive Coordinator
Jennifer Watson
jennifer@tnstormwater.org

Inside this issue:

TDA, Division of Forestry seedlings available	2
FY 2015 Brownfields	3
EPA's Green Infrastructure Collaborative	4
TDEC's new Impaired Waterways Data	5
New EPA Compendium: Permitting Approaches	5
Upcoming Events	8

TNSA Times

Tennessee Stormwater Association News & Information

July 30, 2014

Somewhere Between Flintstones and Jetsons—Using Green Technology to Recycle and Repave Old Roads

By Shawn Lindsey, City of Athens

Thirty years ago I was watching the Jetsons, while lying on my bean bag with my dog Cocoa and hoping I could be flying above my city one day in those awesome cars of the sky. I typically watched the Flintstones and Jetsons back to back and I admired both cultures and thought both had a lot to teach.

However, we have not reached the point of the Jetsons and dinosaur power is not an option until some mad scientists gets off their bums and watch Jurassic park and get inspired! So as long as my Honda Pilot is grounded, I thought I would try and make the road maintenance in Athens as green as possible and be thankful that at least we surpassed the Flintstones (although they did seem fairly sustainable).

Recently, Athens has used pervious concrete, pervious pavers,

grass paving, and other sustainable and green materials for parking lots, sidewalks, trails, and small roads, but these technologies have not reached the point of replacing our road networks. This is mainly due to design issues or economics.

To begin replacing the 130 miles of roads in Athens we needed to find a way to make the existing roads greener and more sustainable until we come to a day that all the roads are removed and are no longer needed.

Traditional asphalt roads that built this great country are anything but green or sustainable. They are black, impervious, and rely totally on fossil fuels, massive quarry operations, and come with huge cost for manufacturing, transport, installation, and maintenance.

Our system of asphalt roads is also growing at a rapid rate taking over farm lands, forests, wetlands, streams, causing heat island indexes to rise, and introducing, in many cases, toxins into the environment in their treatment, production, and through deicing.

So what can we do with oil and rock to make it greener? The Tennessee Department of Transportation (TDOT) is asking this

Continued on page 6



Early Bird registration ends August 9!

[Register Here!](#)

for TNSA's Annual Conference scheduled this September 23-25th.

This year's conference is packed with dynamic and compelling presentations including 2 hands-on workshops on the first day—a morning session: Rain Garden Installation presented by [Tennessee Smart Yards](#) and an afternoon session: Intro to Habitat & Visual Stream Assessments.

Presentations the following 2 days include sessions on permeable pav-

Early Bird Registration Ends August 9th! TNSA Annual Conference September 23-25, 2014

ers installations and maintenance considerations; Urban Riparian Buffer Program; Runoff Reduction Policies; Comparison of Runoff Reduction Manual Methodologies; Low Impact Design Competitions; Municipal Facility SWPPPs; QLP Discussion; Green Infrastructure Case Studies; MS4 Education Opportunities; Integrated Watershed Planning and much more!

We have a few sponsorship opportunities remaining - please check out our Sponsorship Benefits [Here](#).

Thank you to our current Sponsors:

[AMEC](#), [CEC](#), [Belgard](#), [EnSafe](#), [CDMSmith](#), [Suntree Technologies](#), [Stringfellow](#), [Filtrexx](#), [Crystal-Stream](#), [Kuert](#), [Contech](#), [TDA-Forestry Riparian Buffer Program](#), [Tennessee Concrete Association](#), [Tennessee Environmental Council](#) and [Advanced Drainage Systems](#).

Our Keynote Speakers will be
[Tennessee's Wild Side](#) Hosts
Bill Cody (of WSM 650 fame!)
and Janet Ivey
([Janet's Planet](#)!)

Tennessee Department of Agriculture, Division of Forestry Seedlings available!



The Tennessee Department of Agriculture, Division of Forestry is celebrating a century of forest conservation, protection and enhancement.

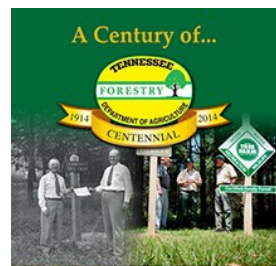
Throughout that time period, the Division of Forestry has offered tree seedlings to meet the conser-

vation needs of Tennessee's landowners and communities.

This year, 55 different hardwood species and 6 different softwood species are available to help meet timber, wildlife, soil conservation and water quality protection objectives. The Division's seedlings can

now be purchased on-line in minimum bundles of 25 seedlings for an individual species.

Visit PlantTNtrees.org to order seedlings or find out more information about the Division's reforestation program.



EPA Announces Funding Opportunity for Strategies to Respond to Water Quality and Drought Due to Climate Change

EPA is seeking applications that take a systems view to investigate how drought (seasonal and prolonged), exacerbated by climate change, may impact surface water and groundwater quality and availability.

EPA is interested in characterizing and predicting water quality as it relates to drought and subsequent drought-related

events, such as changes in surface runoff and wildfires.

The Agency is also seeking information on changes in water quality that are driven by other variations in the hydrologic cycle (extreme events or climate change).

EPA estimates that four awards will be

issued. The anticipated funding amount will be approximately \$4 million total in federal funds for all awards with a minimum 25 percent non-federal cost share required for each award.

The solicitation closes on August 5, 2014 at 11:59 p.m. EDT. For more information, visit Here

City of Kingsport's Greenbelt Wetland Conversion



The City of Kingsport' Parks & Recreation Department recently converted a former pastureland back into a wetland and meadow garden. It is located along the Kingsport Greenbelt just east of the John B. Dennis Highway adjacent to Reedy Creek.

The public sees it as they traverse this section of the Greenbelt. The photo on the left is of the signage located between the creek and the greenbelt just across from the wetland area.



FOCUSED ON WATER, FOCUSED ON YOU.

"Using GIS for stormwater management gives our clients the ability to better manage existing assets and aids in analysis, planning, and design to effectively plan future projects."

Founders Park
Johnson City, TN

Jim Albert



WATER ■ WASTEWATER ■ STORMWATER
TRANSPORTATION ■ SOLID WASTE
LDAENGINEERING.COM



TDOT – Successfully Navigating the Crossroads of Safety, Stormwater Management, and Water Quality.

Proud Sponsor of TNSA

FY 2015 Brownfields Area-Wide Planning (BF AWP) Grants

EPA is announcing the availability of funding to eligible entities who wish to develop an area-wide plan for brownfields assessment, clean-up, and subsequent reuse. This funding is for research, technical assistance, and/or training activities directed to one or more brownfield site(s) located in a specific area (such as a neighborhood, district, local commercial corridor, community waterfront or city block). Each project funded under this grant must result in an area-wide plan which includes specific plan implementation strategies for assessing, cleaning up, and reusing the brownfields site(s) as well as related brownfields and project area revitalization strategies. EPA anticipates awarding approximately 20 projects in total, funded at up to \$200,000 each. Please note that applicants who received a BF AWP grant from EPA in Fiscal Year 2010 or 2013 (FY10 or FY13) are not eligible to apply under this competition. [The proposal submission deadline is September 22, 2014.](#)

[FY2015 Brownfields Area-Wide Planning Grant Guidelines \(PDF\)](#); [Frequently Asked Questions \(PDF\)](#)

EPA will provide two guidelines outreach webinars. The same information will be presented at each webinar. For information on how to join each webinar click [here](#). The Webinar times/dates are:

- July 30, 2014 from 12:30 - 1:30pm EDT
- August 14, 2014 from 2 - 3:00pm EDT

EPA Launches Third Annual Campus RainWorks Challenge

Registration Begins September 2

EPA has launched the third annual Campus RainWorks Challenge, a green infrastructure design challenge for college and university students. Student teams, working with a faculty advisor, will submit design boards, a project narrative, and a letter of support describing a proposed green infrastructure project for a location on their campus. Registration opens Sept. 2 and ends Oct. 3. Registrants must submit their entries by Dec. 19. Winning teams will earn a student prize of \$1,000-\$2,000 to be divided evenly among student team members, and a faculty prize of \$2,000-\$3,000 to support green infrastructure research or training. More information: www.epa.gov/campusrainworks

2014 TNSA East Tennessee Development Symposium: *Registration is open!*

Join us at the Knoxville Convention Center **November 4-5**, for the 2014 TNSA East Tennessee Development Symposium as we explore challenges and discover solutions to the ever-changing world of land development and stormwater management in East Tennessee.

We will be bringing you presentations focusing on multiple aspects of the development industry in East Tennessee including: planning, design, construction, financing, BMP maintenance, regulatory compliance and environmental law and policy. In addition, you will hear case studies and success stories.

Early registration is now open for the 2014 TNSA East Tennessee Development Symposium (draft agenda will be posted on the website by August). Visit <http://tnstormwater.org/blog/2014-development-symposium/> to register.

Through this cart you can register one or more participants. In addition, sponsorship and exhibitor space can be purchased through this cart as well providing a one stop registration shop. Please see the sponsor/exhibitor benefits guide on the website for additional details on sponsorship.

If you have any questions regarding the 2014 TNSA East Tennessee Development Symposium, please contact Parci Gibson by phone or email. (865) 215-5861 or parci.gibson@knoxcounty.org

Focusing on clean water for your communities.



ENSAFE
ensafe.com

f in t

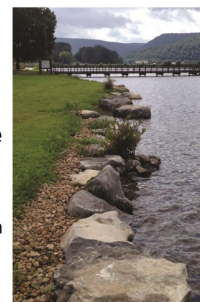
Memphis (901) 372-7962	Nashville (615) 255-9300	Knoxville (865) 693-3623
---------------------------	-----------------------------	-----------------------------



Civil & Environmental Consultants, Inc.

CEC provides diverse water resources services to support the environmental challenges in the Tennessee communities where we practice. To learn more, contact:

Steven Casey, P.E., CPESC | scasey@cecinc.com
405 Duke Drive, Suite 270 | Franklin, TN 37067
Toll-free: 800-763-2326 | Local: 615-333-7797



EPA Launches Green Infrastructure Collaborative

EPA has joined with the U.S. Department of Transportation, U.S. Department of Housing and Urban Development, U.S. Department of Agriculture, U.S. Department of Interior, U.S. Department of Defense, and U.S. Department of Energy to release a Federal Letter of Support for green infrastructure and a Green Infrastructure Collaborative.

EPA will engage with public and private organizations to expand this collaborative and provide a platform for sharing best practices, provide on-the-ground community support, develop actionable planning tools for decision-makers, conduct research on increasing affordability and effectiveness, and align public and private knowledge and resources to promote green infrastructure.

EPA has also launched new [web content](#) to demonstrate how green infrastructure can be used as a tool for building community resilience to climate change impacts such as increased heavy rainfall and heat island effect.

For more information on the federal support letter for the Green Infrastructure Collaborative, click [here](#).



Kentucky/Tennessee Water Professionals Conference Water For Life Event in Chattanooga

More than 25 community organizations, including the Tennessee Stormwater Association, participated in the Water for Life public educational event at Coolidge Park in Chattanooga, Tennessee on Sunday July 20th.

400 people turned out to enjoy the park and stroll through the event, learning about the importance of clean water.

The event, organized by the Young Water Professionals, was part of the annual Kentucky/Tennessee Water Professionals

Conference.

Daphne Kirksey, external affairs manager at Tennessee American Water, said the event was meant to educate the community and help members of the public have a better appreciation of water system deliveries.

"We turn on our tap and the water comes, but none of us—until we get educated—realize the complexities for water to be drawn out of the source," she said.

[TNSA](#) partnered with the [TDOT](#) MS4 and [Tennessee Smart Yards](#) to raffle off

an Ivy Rain Barrel and to share remedies for common residential stormwater pollutants.

Related article [here](#) at Nooga.com.



TN AFPM 2014 5th ANNUAL CONFERENCE

Register Now!!

August 5th – 8th, 2014

The Tennessee Association of Floodplain Management (TN AFPM) welcomes you to our **5th ANNUAL CONFERENCE** in Murfreesboro, TN.

We hope you enjoy this educational opportunity for floodplain administrators, community leaders, and technical professionals throughout the State to keep abreast of current floodplain and stormwater management issues.

Conference Highlights

2 ½ Days of Concurrent Sessions covering a variety of floodplain management topics

Tuesday, August 5th

- Kickoff at 1pm

Wednesday, August 6th

- Full Day w/ lunch

Thursday, August 7th

- Full Day w/ lunch

Friday, August 8th

- CFM Exam

Course instructors from:

- FEMA Region IV
- TEMA
- Local TN Governments
- Industry Leaders

Luncheon Speakers include:

- TN NFIP Coordinator
- FEMA Region IV
- TN AFPM Chair

Certified Floodplain Manager

- Refresher Course
- Exam

Exhibitor Showcase

Networking and Social Events!



Stormwater Consulting Services

- » Stormwater Utilities
- » Stormwater Ordinance Creation
- » Project Inspection
- » Stormwater Capital Improvement Plans
- » Stormwater Outfall Mapping
- » Stormwater Pollution Prevention Plans
- / GIS Database Creation



Gary R. McGill, PE // 2240 Sutherland Avenue, Suite 2 // Knoxville, TN 37919 // 865.540.0801

TDEC Releases New Impaired Waterways Data

The [Tennessee Department of Environment and Conservation \(TDEC\)](#) recently released new data on impaired waterways across Tennessee. Simplified data is [available in an online map](#), while full details of impairments are listed in a [new 2014 report](#).

New EPA Document: MS4 Permits – Post-Construction Performance Standards & Water Quality-Based Effluent Requirements: A Compendium of Permitting Approaches

EPA recently issued the following document: [Municipal Separate Storm Sewer \(MS4\) Permits – Post-Construction Performance Standards & Water Quality-Based Effluent Requirements: A Compendium of Permitting Approaches](#) (June 2014). This compendium presents examples of different permitting approaches that EPA found in its nationwide review by describing, and in some cases excerpting, language from permits.

Availability of the Draft 2014 303(d) Public Meeting Schedule and Comments Requested

The [Tennessee Department of Environment and Conservation](#) has published a [draft 2014 303\(d\) List of impaired and threatened waters in Tennessee](#).

This list, required by the federal Clean Water Act, is a compilation of waters known to not meet one or more water quality standards. Where appropriate, each impaired stream has been prioritized for development of a Total Maximum Daily Load (TMDL).

The document may be found [Here](#). And the Public Notice may be reviewed [Here](#).

The [Public Notice](#) contains information concerning opportunities to participate in this process, including a [scheduled public meeting on August 12th](#). Additionally, the public notice has links to the draft List on TDEC's website, plus a GIS coverage specifically developed to assist the public in their review of the draft document.

Comments regarding the draft 303(d) List or questions about Tennessee's water quality assessment process should be directed to: Greg Denton, Planning and Standards Unit Division of Water Re-

sources 11th Floor, Tennessee Tower, 312 Rosa L. Parks Ave. Nashville, TN 37243 gregory.denton@tn.gov 615-532-0699 (phone).

Mr. Denton will be accepting comments about the draft 2014 303(d) List through August 29, 2014.

Following that date, TDEC will respond to the summarized comments received and will develop a proposed final version of the List which will be submitted to EPA for their review.

EPA Develops Tool to Help Communities Become More Flood Resilient

EPA has released a tool to help communities prepare for, deal with, and recover from floods.

The Flood Resilience Checklist offers strategies that communities can consider, such as conserving land in flood-prone areas, directing

new development to safer areas, and using green infrastructure approaches, such as installing rain gardens, to manage stormwater.

The checklist is part of a new report, "Planning for Flood Recovery and Long-Term Resilience in Vermont: Smart Growth Ap-

proaches for Disaster-Resilient Communities". EPA will host a webinar on lessons learned from the project on August 13, 2014. Details about the webinar can be found [here](#). To view the tool and the report visit [here](#).

Free Webinars!

Innovative Approaches to Financing and Funding Stormwater and Green Infrastructure Investments

08/27/2014 - 1:00 - 3:00 pm Eastern [Registration Link](#)

Introduction: Funding for stormwater management infrastructure is limited while needs continue to increase. Specifically, Federal and state resources to support green infrastructure investment are dwindling, leaving the burden on local governments. The combination of a challenging economic climate and a growing regulatory presence in stormwater has created a significant, and increasing, funding gap in the stormwater sector. Innovative approaches are needed to reduce the cost burden on the public sector through private investment, incentive-based programs, and unique methods of utilizing public funds. The focus of this webcast will be to cover three alternatives to traditional funding streams for stormwater infrastructure investment.

Linking Stormwater BMP Performance to Receiving Water Protection: Improving Selection and Design

Free Webinar! 08/06/2014 - 1:00 - 2:30 pm Eastern [Registration Link](#)

Introduction: Watershed modelers now have a tool that allows them to connect their models to receiving water models as well as meteorological data, cost data, and BMP performance data. Framework Version 2.0 is a software environment that makes it easy for modelers to not only develop statistics and charts by directly reading results from models, such as SWMM and CE-QUAL-W2, but connect those models, so that one provides inputs to the other. The Framework does not attempt to recreate the watershed or receiving water models, but efficiently connects the outputs and inputs together so that watershed managers can more effectively plan and design BMP implementation for their specific watershed needs. Framework Version 2.0 is expected to be released in the summer of 2014.

Continued from Page 1—Somewhere Between Flintstones and Jetsons—Using Green Technology to Recycle and Repave Old Roads

question as well and taking steps to make sure we don't build unnecessary roads and also to make the ones we have even more efficient. I went to a TDOT hosted conference a few years ago in Nashville on Sustainable Pavements and left with a new concept called, "Perpetual Roads".

The idea of creating a perpetual road system is to maintain the roads in a way that they last indefinitely and don't require paving so the carbon footprint of maintaining them is less, the nonrenewable resources of oil and aggregate is less, and then you have a greener and sustainable pavement system - at least until the Jetsons mode of transportation replaces all roads.

During the conference, I learned about all the technologies that were currently available and which ones could be implemented in Athens, TN. Athens was very concerned with the current cost of paving which has increased almost 300% over the past 10 years. So, if we could change the way we do street maintenance in Athens by using new, greener tools to keep roads in such a condition as to avoid paving, then that would save a lot of money and make Athens a more sustainable community and other cities could do the same.

The City of Athens applied for a Green Development Grant which is typically used to do small green development projects and retrofits. My first thought was of not applying, but I knew that adding a tool to reduce the carbon footprint of road maintenance, and particularly if it would save the city and county money, would improve water quality, reduce dependence on oil, and perhaps allow us to use local aggregates and recycled materials in our road treatments. This idea would be the ultimate Green Development Project - particularly if we could learn something to change the municipal road "toolboxes" across the state.

I remembered class after class over the years explaining the way that an asphalt road works. The base is everything and you never want to correct a base failure by paving. The asphalt surface works because it is flexible, but as the oils are baked out they become rigid and begin cracking allowing water to infiltrate and base problems are caused by water, weight, and natural movements in the earth. The key to a perpetual pavement is to keep the surface flexible and waterproof without paving it. Then,

if a base failure happens, you fix it—don't bridge it with asphalt.

Fifteen years ago everyone always put down a minimum of 1.5 inches and sometimes 2 inches of new asphalt every 15-20 years and when roads got too high from adding more and more oil and rock they would mill the materials and dispose of it.

At the time, nobody wanted milled or recycled asphalt in their mixes, but today millings are used on many projects and I think this was one of the first steps to recycling in the industry. The next, was decreasing pavement overlays from 1.5-2 inches to 1 inch, and sometimes less. Currently, many cities are looking at micro-surfacing which is typically .25-.5 inches.

In Athens, we have always had an aggressive crack sealing operation, great pothole patching and utility cut patching operation, and for the last 15 years we have worked with using rejuvenators on our roads under 7 years in age to keep them flexible and replace the oils that were baked out, so the life of the road could be extended another 5-7 years. Some communities have been able to create perpetual pavements with this practice of using rejuvenators on all streets every 5-7 years. My problem, as it is with most cities, is that many of our roads are well beyond the 5-7 year age and rejuvenators won't help and micro-surfacing is too costly to fix all the roads we have.

Our Green Development Grant consisted of purchasing specialized equipment to take more control over the process of installing surface treatments in-house, using a street maintenance crew. The machine is a spray/squeegee machine with the capacity to mix cold, applied, emulsified asphalts with a high content of aggregate. Most spray/squeegee machines are not set up to do more than a typical fog or slurry seal. So we had to specify a heavier duty machine and fit it with a specialized and tailored attachment including a distribution box with width control, and material controls with multiple squeegees to make applications fast enough to get the volume of production for city streets.

The product we started using is called Liquid Road and we combine about 5 pounds of aggregate per gallon of liquid road in the

spray squeegee machine and mix it up before applying it. The result after two coats is a surface treatment about 1/4 inches thick. Before application you have to clean the road, crack seal it, and fix any deviations, like potholes, alligator cracks, or other issues with the base. The end result is a road that looks like it was freshly paved and a surface that should last about 10-12 years at 1/10 the cost of a 1.5 inch overlay that typically last 15-25 years. Economically the process makes sense; even if you contract it out you will save probably about 1/5 of the cost of paving with 1.5

Liquid Road Cost Per Mile	\$10,138
Paving 1 Inch Cost Per Mile	\$66,831
Paving 1.5 Inch Cost Per Mile	\$101,765
Milling Cost Per Mile	\$16,474



inches of asphalt.

Environmental Reasons

The economic reasons for adding a heavy slurry seal such as liquid road with 5 lbs. per gallon of aggregate to a municipalities list of tools for maintaining streets makes perfect sense, but it makes even more sense from an environmental stand point. This is because you have total control over several factors when doing this practice in house.

Aggregates:

Buy Local-When you contract out your pavement treatments, most contractors only use approved TDOT aggregates even if you are just paving a local low volume road. These aggregates may not be available in your area so, like buying fruits and vegetables from your local Farmer's Market, buying local is greener.

Aggregates and sands bought locally are greener and more sustainable than importing them, due to reduced transport costs. Our local quarry has a great aggregate that we use and has the skid

Continued on page 8

Upcoming Events

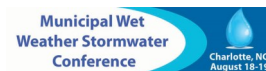
Please email [Jennifer Watson](mailto:jennifer.watson@knoxcounty.org) with your upcoming events:

AUGUST

August 5-8 [5th Annual TN Association of Floodplain Managers Conference](#) at the Embassy Suites, Murfreesboro TN

August 11-13, [Tennessee Hydrologic Determination Training](#)—QHP TN-HDT course, Montgomery Bell State park

August 18 & 19 [EPA Region 4 & IECA Municipal Wet Weather Stormwater Conference](#)—Charlotte, NC



August 22—East Tennessee **TNSA Regional Meeting**, TDOT Auditorium, 7345 Region Lane, Knoxville, TN (Strawberry Plains) 8:30AM. For More info contact Parci Gibson: parci.gibson@knoxcounty.org

SEPTEMBER

September 2—West Tennessee Regional **TNSA meeting**, 1:30 pm at the City of Germantown. Economic and Community Development building 1920 South Germantown Road. For more info contact Don Fent: dfent@cityofbartlett.org

September 6—Cumberland River Dragon Boat Festival 8:00 AM - 3:30 PM, Riverfront Park, Nashville, TN

September 9—Southeast Regional **TNSA Meeting**, DRC 1A, 1250 Market St, Chattanooga, TN 37402 from 10AM-2PM

For more info, contact Leah Crisp: leahc@hamiltontn.gov

September 23-25—**TNSA Annual Conference**, [Henry Horton State Park](#), 4209 Nashville Highway, Chapel Hill, TN 37034

September 26-27 – **Bartlett Fall Festival**, Freeman Park (The City of Bartlett will have a stormwater booth with a simple quiz and a prize (you've seen our visors, stress balls, lip balm, etc.!) for each correct answer).



OCTOBER

October 8-10—[SESWA Annual Regional Conference](#) Charleston, S.C.



CNT Initiative Helps America Become "Rain Ready"

Action-oriented website, videos, and guides promote better water management for people and places

CNT has just launched a new resource to help individuals, businesses, and communities find solutions to the problem of too much or too little water. CNT's [Rain Ready](#) initiative offers a suite of policies and practices to help residents, communities, and states plan for weather events associated with global climate change.

Anchored around the website rainready.org, Rain Ready helps Americans, and their municipal and state leaders, approach the challenges of flooding, water shortage, and/or water pollution in customized and cost-effective ways.

Hot Rain Ready links include:

- [How to set up a Rain Fund in your community](#) (factsheet)
- [Buying a Rain Ready Home](#) (factsheet)
- [How to do a Community Needs Assessment](#) (factsheet)
- Flood victims stories first-hand [videos](#)

EPA Orders 85 Pennsylvania Communities to Improve Stormwater Programs

On June 24, the EPA announced that it sent orders to 85 Pennsylvania municipalities requiring improvements to their stormwater programs. EPA issued the orders to augment Pennsylvania's efforts to ensure effective stormwater management programs are in place to improve water quality in local streams and the Chesapeake Bay.

The federal Clean Water Act requires the cited municipalities to develop and implement a program to reduce contamination of stormwater runoff and prevent illegal discharges of stormwater. EPA's orders also require the cited municipalities to correct deficiencies with their respective MS4 programs and to come into compliance with their Clean Water Act stormwater discharge permits.

For more information click [here](#).

BELGARD HARDSCAPES

JOIN US FOR A SPECIAL EVENT
FEATURING BELGARD HARDSCAPES PRODUCTS!

CHICAGO BRICK OVEN

YOU ARE INVITED TO NASHVILLE'S OUTDOOR LIVING NETWORK HAPPY HOUR!

We hope you can make it time for a little while and join us for the 3rd consecutive Thursday Evening Outdoor Living Network Happy Hour! Belgard will be looking for their Chicago Brick Oven and there will be beverages to wash down the food!

DATE: Thursday, August 14th, 2014
TIME: 5:00pm to 7:00pm

Belgard Design Center
5815 West Center, Nashville, TN 37209
615.293.5488 usa.belgard.com tncustomerservice.belgard.com

BELGARD environmental

Happy Hour!!

Through Thursday Happy Hour

Made in Tennessee

Belgard Hardscapes has teamed up with the Tennessee Stormwater Association to host 2 Networking Happy Hours in Nashville on 8/14/14 & in Memphis on 8/21/14.

We would love to see you there! For more information, please visit our local Facebook Page at: www.facebook.com/volunteerbluegrasshardscape, or by contacting your Belgard Rep, Darryl Sapp @ 865-388-8707.

TENNESSEE STORMWATER ASSOCIATION



Phone: 615-926-7094
admin@tnstormwater.org

We're on the web!
www.tnstormwater.org

"Like" us on Facebook!
<https://www.facebook.com/tnstormwater>



**Become a
member today!**
www.tnstormwater.org



Tennessee Stormwater Association

TNSA Times, Volume 1, Issue 7

Purpose

The mission of the Tennessee Stormwater Association (TNSA) is to assist local government entities in their efforts to comply with State and Federal clean water laws and Stormwater Regulations promulgated by the Environmental Protection Agency and the Tennessee Department of Environment and Conservation; and through such assistance, to protect and improve the quality of the waters of Tennessee. This mission will be accomplished through TNSA members' exchange of information and knowledge regarding the design, construction, maintenance, administration and operation of stormwater facilities. The TNSA will promote the dissemination of information in stormwater control measures and the adoption of improved practices in stormwater administration.

Members

TNSA membership is composed of designated Municipal Separate Storm Sewer Systems (MS4s) including local governments (city and county), universities, military installations, and other entities such as TN Department of Transportation (TDOT). Associate members include environmental advocacy groups, non-profits, Tennessee State, sub-state or federal government entities consultants. Private sector membership is available to for-profit engineering, scientific and management firms or other organizations with an interest in stormwater.

Continued from Page 6—Somewhere Between Flintstones and Jetsons— Using Green Technology to Recycle and Repave Old Roads

numbers we need for our streets.

Recycled Materials

Many of the aggregates you use can be recycled materials. So far, we have had great experience with recycled tire crumb rubber and have experimented with glass cullet, but have not found one that is fractured on three sides. Using recycled materials and having control over the process allows us to experiment with other sands and aggregates that may be a re-use of a waste product. I hope to try other products in the future, such as roof shingles.

Asphalt and Oil

Heat—Using a cold applied product has green advantages. Think about the energy required to keep asphalt typically applied at 300 degrees. Also, imagine what that does to the heat island effect and what impact it has on a stream when it rains a few minutes after 300 degree asphalt is installed.

Conserving Oil—When you look at a 30-year old asphalt, it is gray, cracked, and pitted on top and well-polished, but if you go down a 1/4 inch you see fresh black asphalt with the oils intact and the aggregates in the same condition as the day they came from the quarry. So why replace a 1.5 inches of asphalt when 1/4 inch surface treatment will get you half way to

the life of a 1.5 inch and 2 inch overlays.

Also, because you are only replacing the top 1/4 inch, when you need to replace it again most of that course will be gone so you have no need to mill.

So what is the carbon reduction of installing liquid road instead of a 1.5 inch overlay? The average amount of paving we do in Athens is 4 miles and if we apply liquid road instead then that results in a carbon reduction of 97,137 lbs.

Implementation Cost

The implementation cost for starting your own heavy slurry seals in-house is about \$50,000; which will pay for itself after you reduce your paving needs by a half mile.

You have a big learning curve, but Athens is willing to help you as we are learning more and welcome other cities coming and learning on our crew. Our plan is to eventually avoid paving any local, low volume road, except for the ones that are currently beyond what liquid road applications can fix. This will take some time, but perhaps we will be able to increase the use of this technology to higher volume roads.

We have also implemented other elements of the Athens Green

Streets program including a Falcon Asphalt Recycler for our patching operation. This uses up to 1/3 old asphalt and keeps us from land-filling it. We have also implemented a sidewalk grinding program for trip hazards. In the past we would have replaced an entire section of sidewalk with a trip hazard, but it is cheaper and more sustainable than replacement to grind them smooth.

We need more walkable and bicycle friendly cities and more access to mass transit, but until we take to the skies we will need to find a greener way to maintain our asphalt infrastructure. Athens has a piece of the puzzle, but I am sure there are others. I hope you find this useful until you get a jet car and hopefully your roads will become as sustainable as bedrock. I would prefer to just be beamed up but that is even further down the road...

Shawn Lindsey is Public Works Director for the City of Athens. He may be reached at 423-462-5743 or via email at slindsey@cityofathensstn.com

