

Country Roads & City Streets

WV Local Technical Assistance Program

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College of Engineering & Mineral Resources

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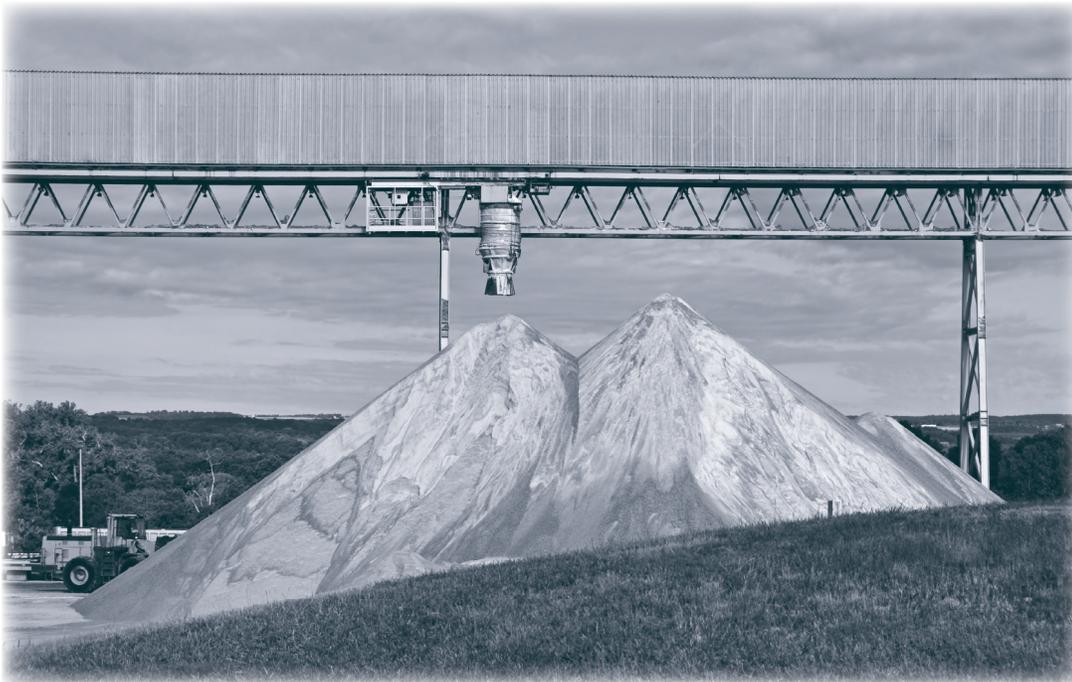
SALT. SALT. AND MORE SALT.

Andrew Morgan, Program Coordinator, WV LTAP

 West Virginia University



<http://wvltap.wvu.edu>



Believe it or not, winter weather is almost upon us once again. In fact, we will probably see our first snow event before the end of November. Are you ready for that storm and the ones to follow? Much thought and deliberation goes into preparing for winter maintenance, but often overlooked is determining what materials will be used for melting ice on the roadways and sidewalks. Road salt is undeniably the traditional method for melting ice, but it is not necessarily the best product.

Road or rock salt, the product road agencies have used for decades, is basically the same salt we use on french fries. Chemically, it is a solid form of sodium chloride (NaCl). Road salt has remained popular over the years because it is very effective at melting ice (in most applications), and it has generally cost less than alternative materials. There are some negative aspects associated with road salt, however. In its solid form, road salt cannot be placed on the road in advance of a storm to keep ice from forming (anti-icing); it can only be spread after the storm (de-icing). Road salt starts to lose effectiveness at 15° F and loses all effectiveness at -6° F. In addition, if a road is over salted, ice will stop melting. Over-salting of roads also puts more salt into ground water, streams, and rivers, which is bad for the environment.

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SALT.SALT. AND MORE SALT. *continued from page 1*

Country Roads & City Streets is published quarterly. The purpose of this newsletter is to provide information that is beneficial to decision makers, elected officials, and roadway construction, maintenance and management personnel.

The material and opinions included in this newsletter are those of the WV LTAP and do not necessarily reflect the views of the Federal Highway Administration or the West Virginia Department of Transportation. Every effort has been made to ensure the integrity and accuracy of both original and borrowed material; however, the WV LTAP does not assume responsibility for any information that is found to be incorrect.



The WV LTAP is part of the nationwide Local Technical Assistance Program, which is funded by the Federal Highway Administration. WV LTAP also receives funding from the West Virginia Department of Transportation.

MISSION:

The mission of the WV LTAP is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

To help achieve this mission, training, demonstrations, personalized technical assistance, and resource materials are provided.

So you may be asking, “What are the alternatives?” There are a few popular manufactured ones highlighted in this article.

Salt brine, made from NaCl, is becoming a very popular alternative. Road salt does not begin melting ice until it mixes with water. When salt is spread on the roads, cars passing over the salt mix it with the ice to begin the brine-making process. The brine solution affects the ice so that the temperature must be colder than 32° F for ice to stay frozen.

Knowing the effectiveness of brine, it makes sense to mix water and salt together at the appropriate proportions and spray it on the roads. This removes a step from the process and encourages the melting to happen more quickly. You can also spray brine before the storm and help prevent the snow pack from binding to the pavement (anti-icing). You can make your own brine by either buying or making a device that combines water and road salt then heats it so the salt dissolves in the water.

Other alternatives include calcium chloride (CaCl₂) and magnesium chloride (MgCl₂). These two products are also “salts,” though they are capable of working at much lower temperatures. Calcium chloride works down to -60° F and magnesium chloride can melt ice down to -28° F. These salts can come in solid form, but are more commonly sold in liquid form. Since these salts work at much lower temperatures, there is less worry about them being diluted as the ice melts. The price of calcium chloride and magnesium chloride salts is typically much higher than traditional road salt, but prices are becoming more competitive.

In 2003, the last time a survey was conducted of road maintenance agencies, the average price per dry ton of these products was \$36 for road salt, \$120 for

calcium chloride, and \$95 for magnesium chloride. However, all prices have risen considerably since 2003. Last year, road salt was selling for \$100-\$140 per dry ton, but is between \$60-\$70 for this season. Magnesium chloride and calcium chloride producers have recently announced that their prices will be going up.

It may seem as though everything is expensive, and there are no good options. While prices are much higher than before, strategies do exist to reduce costs. Anti-icing is one such popular strategy. By implementing anti-icing into your arsenal, the time and materials required to treat roads after a storm can be reduced, saving time and money.

Mixing materials is another strategy that can help to increase the time between treatments and improve efficiency. One of the more common mixtures is road salt and calcium chloride. Some road agencies are using more non-traditional, inexpensive agricultural byproducts, like beet juice. While these products have deicing/anti-icing properties; they are not as effective as traditional salts. However, they can be mixed with liquid salts without losing much performance and may be an option to consider for your agency.

While we do not have all the answers as to what you should be using on your icy roads, we hope that by recognizing some alternative options, your agency will have additional tools to help make this winter more manageable.



West Virginia University uses this Ranger, retrofitted with a brine spray unit, to treat sidewalks and other areas on campus.

GIVEAWAY PUBLICATIONS, CDs, AND DVDs

The West Virginia Local Technical Assistance Program has extra copies of various CDs, DVDs, and publications for giveaway. If you are interested in obtaining a copy, please contact Kevin Butler at (304) 293-9922 or wvltap@mail.wvu.edu.

Highway Safety and Trees: The Delicate Balance – The Federal Highway Administration (FHWA) produced this DVD to further explore the issue of the safe placement of trees along our country's roadsides. The video stresses that the design of highway projects should be a cooperative effort involving the highway agency, concerned communities, organizations, and individual citizens.



Guidelines for the Selection of W-Beam Barrier Terminals – This FHWA CD is a must viewing for anyone with responsibilities for selecting, locating, installing, or repairing guard-rail terminals. Ideally, it should be seen by every design squad leader, every construction inspector, and every maintenance crew chief.

Travel Better, Travel Longer – This FHWA guide highlights specific traffic situations that are particularly troublesome for older roadway users and provides information on the use of appropriate traffic control devices to maximize safety in these circumstances. A variety of effective and relatively low cost improvements are identified in the pocket guide to help state and local highway departments enhance traffic control devices to better address the needs of older drivers.

Publications available for giveaway:

1. New Jersey Tire/Pavement Noise Study
2. Oklahoma Tire/Pavement Noise Study
3. Arkansas Tire/Pavement Noise Study
4. Perpetual Bituminous Pavements
5. Porous Asphalt: The Right Choice for Porous Pavements
6. Expected Service Life and Performance Characteristics of HMA Pavements in LTPP
7. Culvert Management Systems: Alabama, Maryland, Minnesota, and Shelby County
8. Bridge Management: Experiences of California, Florida, and South Dakota
9. Roundabouts: A Safer Choice (brochure)

WV LTAP ATTENDS MUNICIPAL LEAGUE MEETING

Members of the WV LTAP staff recently attended the 40th annual West Virginia Municipal League (WVML) meeting held in Charleston. This year made the third consecutive year of participation by the WV LTAP staff at the annual meeting. It was a good opportunity to make new contacts and spread the word about our program and training.

The WVML was founded in 1968 “to advance the interests and welfare of the people residing in the municipalities of our state.” Because the League is a statewide, nonprofit, nonpartisan association of cities, towns, and villages, the WVML is able to present a “united legislative voice” that communities could not maintain on their own. WVML's website is <http://www.wvml.org/>.

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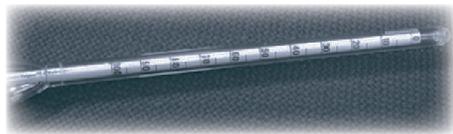
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MAKING SALT BRINE

Iowa Department of Transportation

Making brine is a fairly simple process that requires only two ingredients – water and rock salt. Of course a container to mix the materials properly and storage tanks are also required. To achieve the ideal concentration of 23.3% you will also need a hydrometer or salimeter that can measure the quantity of salt, by weight, in the brine concentration. Hydrometers can be purchased with readouts in specific gravity, percent solution, or salt concentration.



Hydrometer used to measure salt solution.

If the concentration of salt is too high or too low, the temperature when the concentration freezes will be much higher than that of the ideal 23.3% concentration. It is very similar to adding anti-freeze to a vehicle. Water freezes at 32° F and straight anti-freeze freezes at 2° F, but when they

are mixed at 30% water and 70% anti-freeze, the freezing temperature of the two ingredients mixed together becomes -84° F. As the percent of anti-freeze is increased or decreased from the percentage of 30/70, the freezing temperature continues to climb.

The hydrometer is the device that measures the specific gravity of a solution in water but for our purposes, it basically measures the percent concentration of salt in the brine solution. The container you use can be as simple as a bucket.

The City of Oskaloosa and Iowa Department of Transportation (DOT) have used the homemade version for their initial use of prewetting and anti-icing. As confidence and satisfaction grew in the techniques and use increased, the Iowa DOT progressed to more sophisticated purchased units with greater capacities. There are differences in the homemade and the purchased models beyond price, but



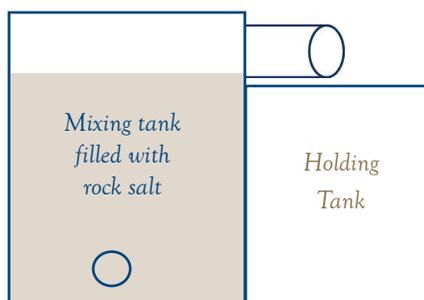
A homemade brine maker used by the Iowa DOT.

both are capable of producing brine at 23.3% concentration.

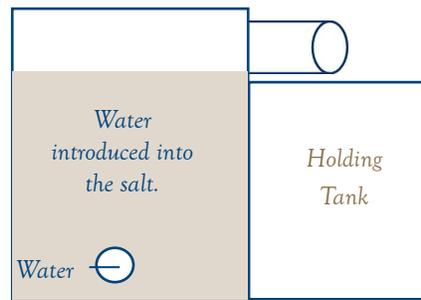
More information on making your own salt brine, including detailed plans for a home brine maker can be found at: <http://www.iowadot.gov/maintenance/internetpages/chemicals/makebrine.htm>.

Special thanks to the Iowa DOT for allowing us to adapt and reprint this information.

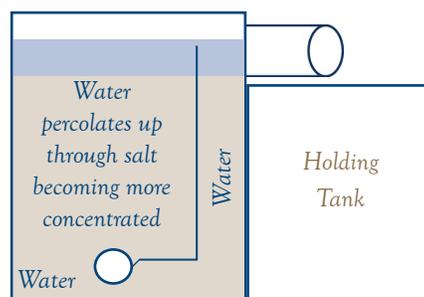
BRINE MAKING IN A PURCHASED UNIT



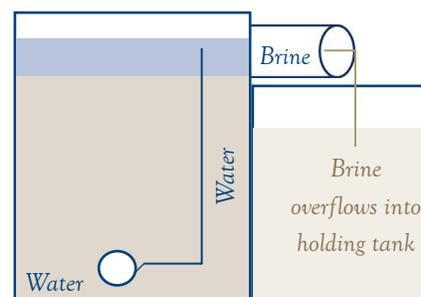
Step 1: Rock salt is added to the mixing tank.



Step 2: Water is added to the salt. A manifold, or other type of mechanism, controls the flow of water.



Step 3: As the controlled flow of water percolates up through the rock salt, the solution becomes more and more concentrated.



Step 4: The liquid at the overflow level is at or near the 23.3% salt solution. The brine solution flows into the holding tank and is tested for concentration using a hydrometer or salimeter.

RON ECK CONDUCTING CLICK, LISTEN, & LEARN SESSION



Dr. Ron Eck will be co-teaching a Click, Listen, & Learn session on sign retroreflectivity. Click, Listen, & Learn is a series of interactive educational programs, provided on the internet by the American Public Works Association (APWA). The programs are led by top experts in the field who convey new ideas, new methods, and new technologies in a fast-paced two hour time frame.

The Sign Retroreflectivity Click, Listen, & Learn Session will be held October 15 from 11:00 AM - 1:00 PM Eastern as an Audio/Web Broadcast. The cost is \$175.00 per site for members and \$225.00 per site for non-members. To obtain more information, or to register online, please visit the APWA website at <http://www.apwa.net/events/eventdetail.asp?ID=5193>. This program has been approved for .2 CEUs or 2 PDHs.

SIGN RETROREFLECTIVITY - WHAT IS IT AND WHY SHOULD I CARE?

Retroreflectivity is a measure of a sign's brightness and visibility at night.

In 2008, the Federal Highway Administration (FHWA) revised the Manual on Uniform Traffic Control Devices (MUTCD) to include minimum retroreflectivity levels. In addition, by January 2012, local jurisdictions must establish and implement a sign assessment or management method designed to maintain sign retroreflectivity at or above the minimum levels and all regulatory, warning, and ground-mounted guide signs must be in compliance by January 2015.

Developing a plan for compliance begins with an understanding of the unique characteristics of retroreflectivity (where light is reflected directly back to the source). This webinar will demystify this cumbersome word. Nighttime visibility challenges will also be examined.

There is concern that having minimum retroreflectivity levels exposes agencies to increased tort claims for fatal and serious injury crashes involving signs. To reduce exposure to, and to help defend these claims, it is important that local agencies be aware of and comply with the new requirements.

This program will help you understand the requirements, legal implications, and importance of having a plan. A second session on retroreflectivity will be held November 19th to show how other agencies have implemented their plan and focus on best management practices.

After viewing the sign retroreflectivity program, participants will be better able to:

- * Explain the difference between retroreflectivity and reflectivity.
- * Discuss the origins and reasons for the new retroreflectivity standards in the MUTCD.
- * Facilitate planning processes within their agencies that will result in effective policies and procedures for compliance with the new MUTCD retroreflectivity standards.

Center Staff & Contact Information

WV LTAP
West Virginia University
PO Box 6103
Engineering Sciences Building
Rms. 651 and 653-B & C
Morgantown, WV 26506
Phone: (304) 293-9924
Fax: (304) 293-7109
Email: wvltap@mail.wvu.edu
Website: <http://wvltap.wvu.edu>

Staff

Dr. John Zaniwski
Director
(304) 293-9955
John.Zaniwski@mail.wvu.edu

Kim Carr
Program Coordinator
(304) 293-9924
Kim.Carr@mail.wvu.edu

Andrew Morgan, P.E., PTOE
Program Coordinator
(304) 293-9939
Andrew.Morgan@mail.wvu.edu

Kevin Butler
Technical Assistant
(304) 293-9922
Kevin.Butler@mail.wvu.edu

Sabrina DeVall
Public Relations Assistant
(304) 293-9930
Sabrina.DeVall@mail.wvu.edu

Dr. Ron Eck, P.E.
Senior Advisor
(304) 293-9931
Ronald.Eck@mail.wvu.edu

Bill Wyant
Senior Volunteer
WWyant@hsc.wvu.edu

The WV LTAP staff has new phone numbers, effective August 10, 2009. Please note these new direct numbers as listed above.

TALKING WITH THE MEDIA

Megan Tsai, Freelance Writer

It's a situation we all face at one time or another. We're going about the business of maintaining and building our roads, supervising our staff and managing our budgets—and the phone rings. It's the local reporter with an "out-of-the-blue" question bound to disrupt the day. While your first thought may be to simply ignore the message and try to catch up with your packed to-do list, don't. As uncomfortable as you imagine the interview will be, your response—or lack of it—has a strong impact on how the public perceives the important work you do every day.

The good news? The interview need not be as painful as you imagine. With a few simple tips, you will be able to handle any question the reporter throws your way and improve your organization's image in the public eye, as well.

Have a Plan. As a transportation official, chances are you have a boss. County commissioners. The mayor. A few trustees. Sound familiar? If you haven't already, talk to these folks about what to do when a reporter calls. Remember, ignoring the call is not an option! Larger cities may have a communications manager or deputy mayor who handles all media calls. In this case, your job will be to get the correct information to this person. Most of the time, you will be asked to field these questions and keep the "boss" in the loop.

Handle the Call. When the call comes (and it will), be prepared. If you have a receptionist, ask them to gather as much information about the reporter's question as possible without putting the call through to you. If you take the call yourself, don't say anything right away. Ask a lot of questions about what they need to know, and then set up a time for the interview a little later in the day (a couple hours should do the trick).

Ready, Set, Prepare! Carefully consider the reporter's question. What do they want to know? Why? The best way to combat any negative story is with sympathy and understanding. For example, if the story is about drivers frustrated by construction congestion, explain that you understand the drivers' aggravation and apologize for the inconvenience. Then, remind motorists about the benefits of the completed project. After thinking about the question, put together five main points you would like to make. These points should contain very few numbers, no acronyms and should be a few sentences each. These will be your talking points, and you will stick to them throughout your interview.

Look the Part. Like any other professional situation, it's important to look put-together for your interview. If you frequently work in the field, consider keeping a pair of khakis and nice button-down or polo in your office for last-minute interviews. During your interview, don't chew gum, swivel in your chair, shift from side to side, glance around the room, or jingle keys or change in your pocket. While these gestures are natural in a nerve-racking situation, they can make you look unreliable. Remember, nothing you say to a reporter is ever "off the record." This is especially important to remember during print interviews, which are more like a casual conversation. Even if the reporter doesn't have a notebook out, they are still taking mental notes.

Stick to the Point. Remember the five talking points you planned out earlier? Stick to them now. Always look for a way to steer the answer back to one of these main points. For example, if the reporter asks an off-subject

question say, "That's a good question, Jane. I think when considering that it is important to remember (your talking point here)." It's a trick the professionals use all the time. Ever seen a presidential press conference?

If the reporter asks a question you're uncomfortable with or don't know the answer to, simply say, "You know, I don't know the answer to that right off the top of my head, but I'll be happy to look into it for you and get back to you later today." **The most important rule: never say "No comment."** It looks fishy, and if you say it, they'll use it in their story.

By following these five simple steps, you'll ensure a better result for the story. Remember, not every story will be a glowing review of your organization. But, by answering the reporter's questions in a way that is understanding and responsive to concerns, you'll gain respect and credibility in the public eye—even in the worst situations. And, by establishing a professional working relationship with your local reporters, you'll make future interviews more friendly and relaxed. A good thing for the next time the phone rings (and it will)!

About the Author: Megan Tsai is a full-time freelance writer and former television reporter specializing in transportation and engineering. She writes business communications including articles, brochures, booklets, case studies, and presentations for companies and organizations across the country. Learn more about Megan and contact her through her Web site: www.RedWagonWriting.com. Article reprinted with permission.



THE EFFECTS OF FLUSHING WASH WATER DOWN STORM DRAINS

The history of waste water regulations makes the future clear: discharge limits will continue to become more stringent. Minimize the impact of these regulations on your shop by adopting a dry shop goal, which will help you reduce floor wash water

volume and contamination. This, in turn, reduces your liabilities, protects the environment and community, and even saves you time and money spent cleaning floors.

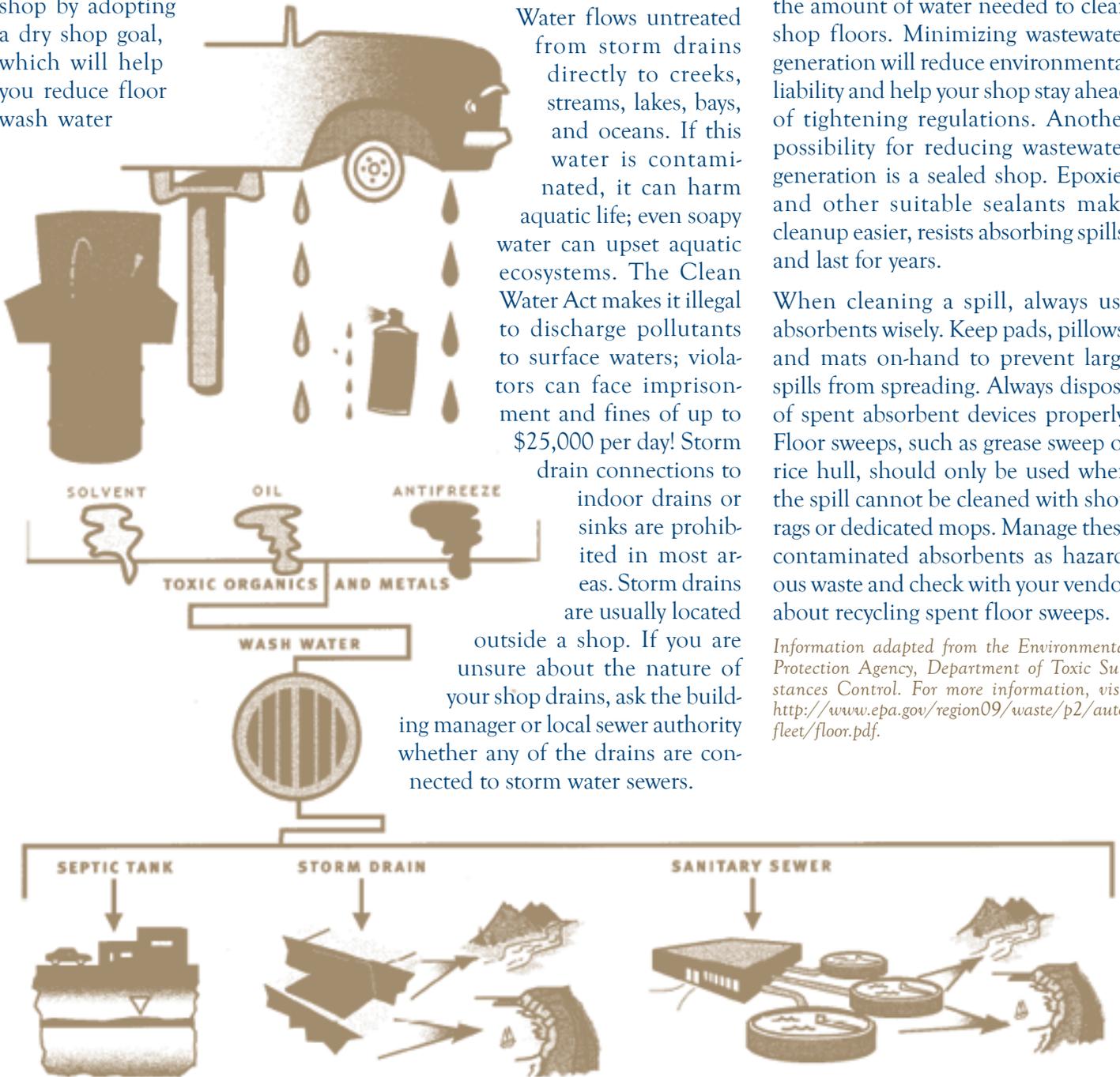
Water flows untreated from storm drains directly to creeks, streams, lakes, bays, and oceans. If this water is contaminated, it can harm aquatic life; even soapy water can upset aquatic ecosystems. The Clean Water Act makes it illegal to discharge pollutants to surface waters; violators can face imprisonment and fines of up to \$25,000 per day! Storm

drain connections to indoor drains or sinks are prohibited in most areas. Storm drains are usually located outside a shop. If you are unsure about the nature of your shop drains, ask the building manager or local sewer authority whether any of the drains are connected to storm water sewers.

Keeping your shop clean and safe is essential to protecting the environment. Preventing spills from ever reaching the floor and cleaning up spills immediately will significantly reduce the amount of water needed to clean shop floors. Minimizing wastewater generation will reduce environmental liability and help your shop stay ahead of tightening regulations. Another possibility for reducing wastewater generation is a sealed shop. Epoxies and other suitable sealants make cleanup easier, resist absorbing spills, and last for years.

When cleaning a spill, always use absorbents wisely. Keep pads, pillows, and mats on-hand to prevent large spills from spreading. Always dispose of spent absorbent devices properly. Floor sweeps, such as grease sweep or rice hull, should only be used when the spill cannot be cleaned with shop rags or dedicated mops. Manage these contaminated absorbents as hazardous waste and check with your vendor about recycling spent floor sweeps.

Information adapted from the Environmental Protection Agency, Department of Toxic Substances Control. For more information, visit <http://www.epa.gov/region09/waste/p2/autofleet/floor.pdf>.



Discharges to septic systems can cause soil, groundwater and drinking water contaminations, creating site cleanup liabilities.

Discharges to storm drains flow directly to surface water, causing water pollution and aquatic ecosystem damage.

Metals accumulate in sewage treatment sludge, preventing its beneficial use. Some contaminants "pass through" and are discharged to lakes, rivers, bays, and oceans.

UPCOMING TRAINING OFFERED BY THE WV LTAP

The West Virginia Local Technical Assistance Program will be offering a series of training opportunities over the next few months. The courses listed are prescheduled and you can call us immediately to reserve your spot. More training sessions will be added, so be sure to check our website regularly for an updated schedule. Complete course descriptions are also available online. If there is a specific course you would like us to offer, please contact Andrew Morgan at 304-293-9939 or Kim Carr at 304-293-9924.



- October 13, 2009
Hot Mix Asphalt (HMA) Pavement Preservation and Rehabilitation;
Clarksburg, WV
- October 15, 2009
Unpaved Roads; Moundsville, WV
- October 27-29, 2009
7 Habits of Highly Effective People;
Burlington, WV
- October 28, 2009
Work Zone Traffic Control and
Flagger Certification;
Ranson, WV
- December 15-16, 2009
7 Habits of Highly Effective People;
College Park, MD

West Virginia Local Technical Assistance Program
West Virginia University
College of Engineering and Mineral Resources
Department of Civil and Environmental Engineering
PO Box 6103
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We Want Your Input!

We are currently conducting a Needs Assessment Survey, which is available on our website at <http://wvltap.wvu.edu>.

If you would like to receive our newsletter and other publications electronically, please notify us by email: Kim.Carr@mail.wvu.edu or Sabrina.DeVall@mail.wvu.edu.

Thank you for your assistance.