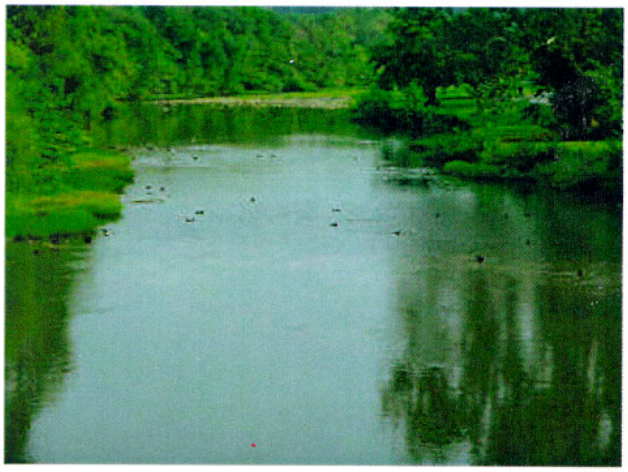
Salem Cares!

Remember: The Roanoke River is only a storm drain away!



Environmental Education Plan for the City of Salem: NPDES Phase II Storm water Action Plan

Fall 2002

This packet is the first part of a product completed by the Environmental Problem Solving Studio students at Virginia Tech.

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List of Acronyms for Reference

BMP – Best Management Practices

EPA – Environmental Protection Agency

MS4 – Municipal Separate Storm Sewer Systems

NPDES – National Pollution Discharge Elimination System

PSA – Public Service Announcement

STOPP - Storm Water Pollution Prevention Program

SWDA - Solid Waste Disposal Authority

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PART 1: Background and Information

A. INTRODUCTION

Salem, Virginia is a unique community that boasts strong employment, great educational institutions, an athletic tradition, and a strong connection between citizens of the town. The town of Salem is predominantly a white community, that is well educated and has a high home ownership rate (refer to Table 1). This small community has recently been required to conform to National Pollutant Discharge Elimination System (NPDES) Phase II regulations. These regulations deal solely with storm water pollution at local level. Many citizens are unaware of how their daily activities can lead to pollution of our water resources. The goal of this project is to reach the population through education and outreach to achieve the NPDES Phase II standards.

Table 1: Overview of Salem

POPULATION	24,635
SQUARE MILES	15
POPULATION DENSITY person/sq mile	1649
% COLLEGE GRADUATES	8.30%
HOME OWNERSHIP RATE	63%
TOTAL HOUSING UNITS	10403
PERSONS PER HOUSEHOLD	2.32
MEDIAN HOUSEHOLD INCOME $	31,133
ETHNICITY	91.9% white
	5.9% other

Source: http://www.census.gov

Since 1990, the Environmental Protection Agency (EPA) has been implementing a plan under the Clean Water Act to try to correct problems of water quality throughout the country. The National Pollution Discharge Elimination System Plan or NPDES consists of two parts.

AETC CD

Phase I regulations focus on larger cities with populations of 100,000 people or more, whereas Phase II regulations concentrate on smaller communities. The city of Salem, Virginia is in the process of conforming to Phase II regulations. On their website, the EPA gives advice on what type of information should be included in the plan. Some of this information includes public outreach/education for homeowners about lawn and garden activities, water conservation practices, proper disposal of hazardous waste, pet waste management, and trash waste management. There are also public outreach/education programs that target children, minorities, and disadvantaged communities; education/outreach programs for commercial activities; public outreach programs for new development such as low impact development; and pollution prevention programs for existing development. The EPA also gives examples of educational displays, pamphlets, booklets, and utility stuffers, using the media, promotional giveaways, and pollution prevention for businesses. Some municipalities have already implemented some of these programs and others are in the process of doing so.

Two of the main goals of Salem's new plan are to educate its citizens, and involve the community. Educating citizens about storm water management may be new, but the mechanism for performing this work is already in place. For example, many cities use monthly utility bills to communicate important information to their residents. Posters, brochures, and flyers describing city functions are also commonly used. With increasing technology, the internet has become a way for distributing information to the public in a very cost effective and efficient manner. For any type of public program to be successful, it must involve its citizens. By providing citizens with information, they can be involved and aid the government in some of their programs and functions. Just as cities have gotten their citizens involved in other types of

Government programs, they need to get their citizens involved in storm water focused programs as well.

NPDES Phase II regulations deal with storm water pollution and have become necessary for improving water quality throughout the United States. After the implementation of Phase I regulations, the water quality of many water bodies improved greatly. This caused the EPA to look at implementing a plan specifically designed for smaller MS4's (municipal separate storm sewer systems). The end product was the Phase II Final Rule. The actual development process involved a great deal of community participation. The EPA developed the Phase II Final Rule through extensive consultations with varying interested stakeholders, such as representatives of many small businesses, which participated in an advisory process. The EPA states that municipalities must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water. Overall, the EPA considered over 500 individual and organizational comments in the development of this document.

B. STORM WATER RUNOFF GUIDELINES---EPA

The Phase II Final Rule's main purpose is to expand programs by requiring additional operators of MS4s in urbanized areas and operators of small construction sites (1 to 5 acres) to implement programs and practices to control polluted storm water runoff. Under this rule, operators of the above MS4's and small construction ventures are required to apply for NPDES permit coverage. The main objective of the NPDES is to implement BMP's (Best Management Practices). These include:

Small MS4s

- An operator is expected to develop, implement, and enforce a program designed to reduce total discharge from their MS4 to the "maximum extent practicable".
- Six minimum control measures: (1) public education and outreach (2) public participation (3) illicit discharge detection (4) construction site runoff control (5) post-construction runoff control (6) pollution prevention.
- Selection of BMP's and measurable goals. Periodic reporting to the NPDES authority is required.

The Final Rule also states that the operator must comply with the Clean Water Act indefinitely. In addition to the BMP's, the EPA has come up with six control measures – public education and participation, illicit discharge detection and elimination, construction site runoff during and after construction, pollution prevention. The EPA is working with a Non-Governmental Organization, AETC. AETC has provided a toolbox to provide guidance and resources to local communities to implement the Phase II requirements. This toolbox includes the following components: fact sheets, guidance documents, menu of BMP's, informational website, training and outreach efforts, technical research, support for any demonstrative project, and compliance monitoring and assistance tools. This toolbox is in the form of a CD-ROM and is available (CD included in packet).

AETC CD

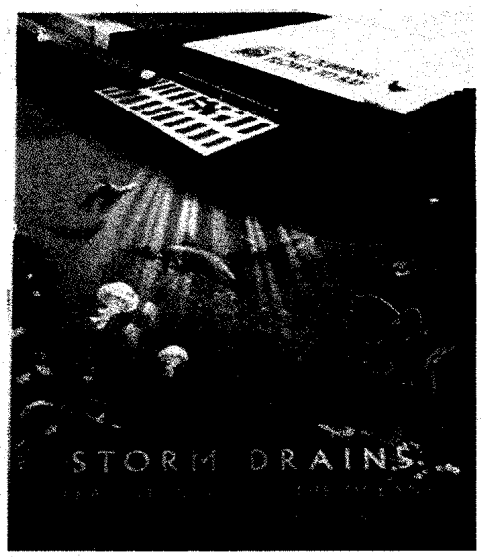
The main goals of the Phase II Final Rule are as follows:

- To encourage the use of general permits
- Provide flexibility for regulated operators to determine the most appropriate storm water controls
- Allow for the recognition and inclusion of existing NPDES and non-NPDES storm water programs in Phase II permits
- Include public education and participation efforts as primary elements of the small MS4 program

- Attempt to facilitate and promote watershed planning and to implement the storm water program on a watershed basis
- Work toward a unified and comprehensive NPDES storm water program with Phase I of the program

(List from EPA-NPDES website – www.epa.gov/npdes/pubs/fact1-0.pdf)

Figure 1. AETC CD
Sample Educational Visual.



The NPDES Phase II Final Rule is basically a step to reduce impacts to water quality and habitats through regulation, education, and the use of permits. It seeks to better control discharging and leaching of polluting substances by not allowing them to get into our lakes, rivers, and streams. The EPA plans to implement the Final Rule wherever it deems necessary in order to preserve these precious waterways.

C. CASE STUDIES

Under the NPDES Phase II Regulations, the EPA requires municipalities to develop Storm Water Management Education Plans. A number of municipalities across the nation have implemented Storm Water Management Education Plans. By looking at what other municipalities have done, we can use this information to develop a plan that can be installed and implemented in the city of Salem. The city of Salem, Virginia, in conjunction with a group of students from Virginia Tech, is currently in the process of developing a public education and outreach program for the city in regards to storm water management, pollution, and run-off.

Greensboro, North Carolina

The city of Greensboro, North Carolina has implemented its version of a Storm Water Management Education Plan. Their plan is acting as a model for which

the city of Salem wants to follow, because both of cities are using the consulting firm AMEC-Earth and Environmental to develop their respective plans. Greensboro has a very informative and creative website dedicated to storm water management that can be found by looking at http://www.ci.greensboro.nc.us/storm water/. What makes their website effective is how easy it is to use and locate certain information. Included in the website are links to Frequently Asked Questions about storm water and storm water management, all types of current programs, public outreach, volunteer programs, a mascot, and important contact information. Some of the programs that are being used in Greensboro are:

- Storm Water's Public Outreach and Awareness Program – This program is devoted to educating the public about storm water issues and actions of the Storm Water Management Division. Public Outreach is responsible for developing and implementing public education and awareness programs for citizens and businesses on storm water management and environmental related subjects. The Storm Water Management Division provides the community with comprehensive environmental education. This division works with the media, and develops environmental education messages and communication tools. Programs have also been developed to target children, adults, and businesses with ideas about what they can do to protect water resources.
- Volunteer Programs – To compliment the environmental public communications programs, the Storm Water Management Division has created several environmental volunteer programs. Citizens are encouraged to participate in these programs. The Storm Water Services Division who provides all the supplies and training for Drain Marker Program sponsors the first program. People can help preserve water resources by gluing small signs that read "Don't Dump-Drains to Lakes and Creeks" to storm drain

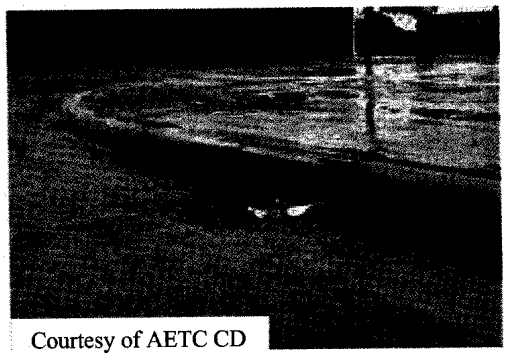
covers. People also receive fish-shaped door hanger brochures to hand out in the project area to explain the Drain Marker program to others. The Green Heroes Program has three different programs in it: Adopt a Street, Adopt a Stream, and Adopt a Park. The Green Heroes Adopt a Street program is committed to cleaning up one-mile sections of a Greensboro city street at least four times per year, and applying Drain Markers on storm drain covers in the area. The Green Heroes Adopt a Stream Program is similar to the street program except it deals with streams. The Green Heroes Adopt a Park Program takes an active role in the environmental health and appearance of parks and other public common areas.

Fort Worth, Texas

Through the Environmental Management Department of the city of Fort Worth, a website titled *Storm Water Quality* is available (http://www.ci.fort-worth.tx.us.dem.stormpg.htm). This website is home to a Storm Water Educational page, List of Storm Water Permit Requirements, Storm Water Ordinances for the area, information on reporting a spill, and a children's page with information and fun activities to involve the local youth. There are also links to various pollutant reduction campaigns and their guidelines, statistics, and ways residents can help prevent and improve storm water quality in the area. This website also contains various logos, brochures, and information bulletins.

Redwood City, California

As part of the San Mateo Countywide Storm Water Pollution Prevention Program (STOPP), Redwood City is working to prevent storm water pollution. This program can be examined by going to the website http://stopp.tripod.com/index.html



Courtesy of AETC CD

which is home to a lot of educational information regarding storm water. Included in this website are links to brochures covering storm water management for various industries such as food processing, construction, and automotive maintenance. There are also residential information brochures such as general BMPs, home and garden, and power washing. Some of the projects that are currently under way are art contests and poetry contests. San Mateo is also hosting the "River of Words" project which is an international contest designed to nurture respect and understanding of the natural world by encouraging young children to learn their "ecological address" and to describe through poetry and art their own "place in space".

Courtesy of AETC CD

To Watershed

Huntsville, Alabama

The city of Huntsville, like many cities and counties across the United States has a copy of its entire storm water management plan online for the public to view. This plan can be viewed by going to http://www.ci.huntsville.al.us/NatRes/program.htm#SWC. Section 13, Educational Activities, examines the objectives and gives a general description of educational activities that are designed for storm water management in the area. The main objective is "to promote a general awareness of water quality concerns and issues, and to encourage proper handling and disposal of wastes," in addition to, "public education efforts to target particular audiences for presentation of technical information and Best Management Practices." The educational activities of Huntsville are handled by several different local agencies. The City Planning, Engineering, and Public Works Drainage Divisions have combined efforts to educate developers and contractors on erosions control and BMP's. Through the Mayor's Office of Huntsville, Operation Green Team was developed. Operation Green Team educated the public

on litter prevention and clean-up, the Adopt-a-Mile program, and the Adopt-a-Stream program. The Solid Waste Disposal Authority (SWDA) has implemented an on-going program to emphasize the importance of proper waste disposal, used oil recycling, and the value of recycling. The efforts of the Operation Green Team and SWDA are complemented by an organization called EarthScope. EarthScope is an organization that works with Huntsville City Schools that is dedicated to environmental education. EarthScope coordinates presentations by agencies such as Operation Green Team, provides reference materials for teachers, and organizes and conducts field trips to enhance the students' understanding of the environment.

D. BEST MANAGEMENT PRACTICES

Public education and outreach on storm water impacts

There are many ways to satisfy the NPDES Phase II Storm water Action Plan requirements for public education and outreach on storm water impacts. These Best Management Practice's (BMP's) are designed to educate Salem residents and businesses about storm water pollution and to give them some ideas about how they can reduce or eliminate storm water pollution and protect the Roanoke River. The programs and activities for outreach are as follows:

- **Using the media.** Media resources can be used to alert Salem residents about NPDES storm water protection practices. Some of these media sources could include public announcements at the Salem Civic Center and various sporting events; informative radio messages for Salem residents describing safe storm water practices, and public access television can air videos to educate residents about safe storm water practices and protecting the Roanoke River. A website would also be a valuable tool in informing and educating the residents of Salem, VA.

- **Educational pamphlets, displays, books, utility bill inserts.** Educational pamphlets and brochures can be distributed to residents to inform about safe storm water practices and protecting the Roanoke River. Library displays can be used to get people thinking about the ways in which they affect the Roanoke River. The displays can also showcase informative children's books relating to protecting water quality. Messages can be printed on utility bills reminding residents of the need to protect storm water and the Roanoke River.

- **Promotional activities.** These activities, such as guest speakers, setting up information booths at the children's festival and the farmers market, can all be used to educate citizens and get them thinking about storm water protection. Children's activities can be included in promotional programs to heighten their awareness through the use of educational games and interaction with an environmental mascot.

Public involvement/participation

These BMP's are designed to get citizens involved in storm water pollution prevention in a way that educates them, while at the same time, shows them that they can make a difference. Opportunities for members of the public to participate in program development and implementation used in other case study examples include storm drain stenciling, stream clean-up and monitoring programs, community monitoring hotlines, and administering and or taking surveys. Involvement in these activities also helps Salem meet the education and outreach goals set by the EPA. Some of the possible activities include those listed below:

- **Storm drain stenciling.** Stenciling can be used to alert residences about the consequences of dumping down storm drains that lead directly to the Roanoke River.

- **Stream cleanup and monitoring programs.** Schools and environmental organizations can take part in stream clean ups to ensure that the water quality of the Roanoke River is not endangered.
- **Community monitoring hotlines.** Residents of Salem can use a monitoring hotline to alert City officials of illicit dumping or pollution.
- **Administering and taking surveys.** Salem officials can use the results of the conducted survey discussed in the next section to tailor their education programs accordingly. The survey can be re-administered by citizens in the future to gauge the success of the educational programs.

The City of Salem should take advantage of these resources to ensure eager and effective education and outreach.

Pollution prevention/good housekeeping for business locations

Listed below are some BMP's that satisfy the NPDES Phase II Storm water Action Plan requirements for pollution prevention and good housekeeping. All of the activities deal with what individuals or businesses can do to reduce the amount of contaminated storm water that flows into the Roanoke River. Businesses need to be educated on these practices so that they can pass the information on to their employees.

Preventing exposure to storm water

The easiest way to minimize pollutants in runoff is to prevent exposure to storm water in the first place. The following steps are ways to keep all potential pollutants within areas of a businesses' location where they do not come into contact with rainwater, storm water runoff, or wash water from other site activities:

- **Perform vehicle/ equipment maintenance in a single designated covered facility.** Four walls are not always necessary; often just a roof will suffice if runoff is routed around the facility.
- **Develop tools.** Prepare laminated cards and place in vehicles describing notification procedures for spill incidents and place in company vehicles.
- **Post signs at maintenance facilities and yards**. Post good housekeeping signs wherever there is a chance that spills and leaks can occur. Make items such as drip pans and spill kits readily available at these locations to prevent spills and leaks from coming in contact with storm water runoff.
- **Perform vehicle/ equipment washing in a single, designated covered facility.** Recycle wash water and/or discharge to the sanitary sewer system.
- **Store bulk materials under cover (e.g., roof or tarps), use dumpsters with lids for storage of waste materials and garbage.** Covering these materials keeps the chances of runoff from carrying these pollutants into storm drains and the Roanoke River.
- **Make sure all containers are labeled and stored correctly.** Store indoors whenever possible, and routinely check for leaks.
- **Make sure that building drains, or drains in outside storage or processing areas, do not discharge to the storm sewer system.** Process areas should be graded to minimize storm water run-ons to drains. The drains should then be connected to the sanity sewer system or an on-site recycling or treatment unit.
- **Providing containment.** The next best measure to minimize pollutants in runoff is to provide containment so the pollutants don't come in contact with storm water runoff.

- **Use drip pans and other containment devices.** To prevent spills while servicing vehicles, or for vehicles and equipment parked for extended periods. Drain fluids out of equipment and vehicles that sit idle for more than a month.
- **Enclose fuel tanks and other large liquid containers within secondary containment.** Include valves that can be closed to prevent a large spill from traveling offsite. Follow other regulations to properly size the tank containment area.
- **For bulk materials stored without cover, provide containment berms or walls and install inlet protection on nearby storm sewer drains.** Sweep or vacuum accumulated material behind the inlet controls regularly.
- **Control erosion.** Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes. The most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils.
- **Consider storm water filters.** Storm water filters rely on vegetation, compost, sand or other filter media to filter out pollutants in storm water.
- **Consider storm water detention ponds and wetlands.** For larger maintenance yards, consider installing detention ponds or wetland to treat site runoff before it is discharged to the storm sewer system or waterways.

Construction site storm water runoff control

Construction site storm water runoff control methods aim to reduce impacts of construction activities while they are taking place. During the construction process, there are construction materials, trash, and unearthed soil littering the ground, which can contaminate storm water runoff. If construction sites are not addressed during the development stage, they can do serious damage to nearby waterways. BMP's of this type of activity are listed below.

Runoff and sediment control

- Minimize grading
- Aquatic buffers
- Erosion prevention measures:
    - Runoff control fences
    - Low impact design and better use
    - Protect steep slopes
    - Riparian Vegetation
- General construction site waste management and good housekeeping
- Storm water retention ponds

Post construction storm water management

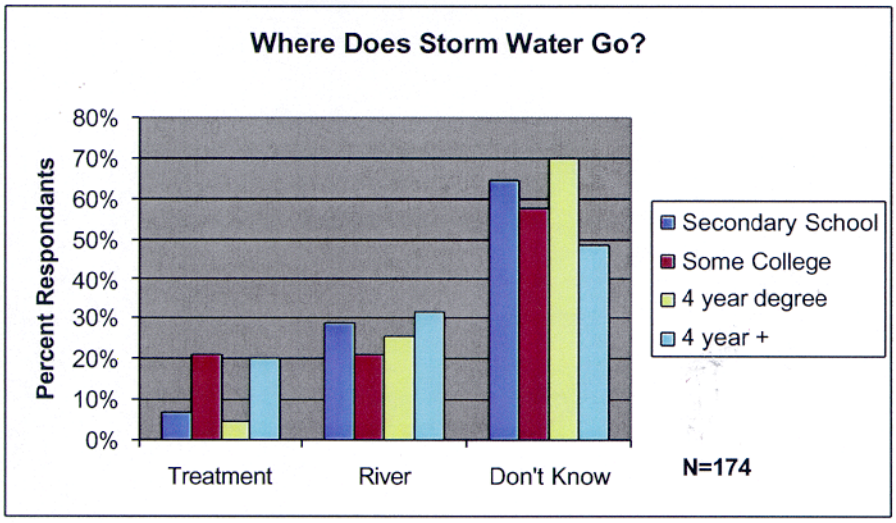
Post construction management methods aim to reduce impacts of construction after the development stage is over. After construction there is leftover litter, construction debris, and unearthed soil, which can continue to pollute storm water. If construction sites are not appropriately cleaned up after development is completed then these sites can continue to pollute waterways.

E. SURVEY RESULTS

We began our study by creating a survey instrument to examine the behaviors and attitudes of the residents of Salem, relating to storm water management. We conducted an initial pilot study to test our instrument and made changes to it based on the responses gathered that day. A final copy of the survey was administered to Salem residents at the annual Children's Festival and through the Salem elementary schools. One hundred and thirty nine responses were collected from the school system and thirty-five were collected from the Children's Festival. For more information on the survey methodology, please see appendix B.

As figure 2 shows, there was no correlation between an individual's education and knowledge relating to where storm drains empty. The highest percentage of respondents answered in the "don't know" category (103 respondents).

Figure 2



Data merged from both samples.

Survey respondents were presented with a list of items and asked to check the ones that they believed were harmful to the Roanoke River. All of the items in the list were actually harmful in someway to the Roanoke River. As shown in Table 2, only 27% of Salem residents knew that their yard clippings could be harmful to the environment. Most respondents knew that motor oil (94%) and fertilizer (73%) were harmful to the Roanoke River. Only half of the respondents knew that soap/detergent was harmful to the environment.

Table 2: Substances that are harmful to the Roanoke River

Which household substances are harmful to the Roanoke River?		
	Total	**Percent of respondents**
Soap	90	50.28%
Detergent	109	60.89%
Yard Clippings	49	27.37%
Fertilizer	130	72.63%
Motor Oil	169	94.41%
None of the Above	4	2.23%

N=174
Data merged from both samples

As shown in Table 3, most residents allow the City of Salem to pick up their yard waste via curbside pickup. This is of concern for storm water issues, because clippings can make their way into storm drains and into the river, adding excess fertilizer and chemicals to the water, as well as adding accumulating clutter in the waterways. However, 32% of people responding to the yard waste question compost their yard waste.

Table 3: Disposal of Yard Waste

How do you dispose of yard waste?	**Number of respondents**	**Percent of respondents**
Trash	45	25.14%
Compost	58	32.40%
Side of road pickup	76	42.46%
Recycling center	2	1.12%
Not applicable	4	2.23%

N=174
Data merged from both samples

In response to these two questions, one respondent remarked, "Where is the hazardous waste drop off site?" More than a few respondents made similar comments. As suggested by the results in Table 3, these pollutants may end up in the Roanoke River because residents do not know how to deal with paint, pesticides, and other hazardous pollutants.

Table 4. Hazardous Waste Results

How do you dispose of unused paint?	Number of respondents	Percent of respondents
Trash	36	25.71%
Hazardous Waste Drop Off	38	27.14%
Not Applicable	64	45.71%
How do you dispose of unused pesticides?		
Trash	29	20.71%
Hazardous Waste Drop Off	30	21.43%
Not Applicable	81	57.86%

N= 139
Results from Salem Schools

Summary

These survey data suggest key focus points for the educational and outreach component of the NPDES Phase II regulations in Salem. Clearly residents need to be alerted to:

1.) Location of hazardous waste drop off

2.) Where storm drains empty

3.) Items that are hazardous to River, including yard waste

The City of Salem needs to spend the most time on these educational components.

Part 2. Education and Implementation

F. WEBSITE

Virtually everyone has some sort of access to the internet. The internet is a wonderful avenue for educating the public. The website was created as a tool for Salem officials to educate the residents of the area. The website includes extensive amounts of information dealing with storm water education for the public. The website includes survey information on resident knowledge, a kids section with links to games, helpful web links, a question and answer page, and a section to educate residents on good practices in their homes and at their businesses.

G. ENVIRONMENTAL EDUCATION: SENIOR CITIZENS

When engaging in an environmental education initiative for an entire community, it is important to include senior citizens. Not only is it important for them to be aware of what is happening in their community, but they can also be an extremely useful resource. Older and retired adults are often anxious to contribute positively to their community, and often have an ample amount of time to give towards whatever project is at hand. In Salem, a fairly large portion, 16.8%, of the population is 65 years old or older. The city encourages its senior citizens to stay active and involved. It caters to their needs, providing them with a variety of community services including a senior center. The senior center provides many different activities for seniors free of charge. These activities include exercise classes, such as Ballroom Dancing, Tai Chi, and Line Dancing; as well as computer classes, and bridge. Also, arts and crafts sessions such as quilting, knitting, basket weaving, and ceramics are available for a small materials fee. The senior center also organizes various outings and field trips for older adults as well as arranges for their transportation.

Facilitating environmental education to seniors through the senior center would be an extremely effective way to reach the older population of the city. Activities such as a speaker series involving environmental professionals from the local planning office, local non-profit organizations, and surrounding colleges, would be very educational. Table 5 contains a list of potential speakers. Also, activities could be arranged through the senior center such as a picnic on the Roanoke River, a field trip / tour of Salem's water treatment facilities, or a trash pick-up along the Roanoke River. Additionally, through the speaker series, members of the senior community would have an opportunity to learn about volunteer opportunities in the area.

Table 5. Proposed Speaker List

Speaker	Title	Speech Topic	Contact Information
Dr. Brook Crozier	Biology Professor Roanoke College	contaminant source tracking	(540) 375-2548 crozier@roanoke.edu
Jon Cawley	Biology Professor Roanoke College	water quality, drainage	(540) 389-3906 jcawley@roanoke.edu
Herbert Cormier	Volunteer Coordinator Roanoke River Watershed Senior Environmental Corps	water quality, volunteer opportunities	(540) 427-1800 hcormier@explorepark.org
Representative: Salem Engineering Dep	Engineer	storm drainage	(540) 375-3032 engineering@ci.salem.va.us
Alan Raflo	Virginia Water Resources Research Center	watersheds, storm water rules	(540) 231-5463 araflo@vt.edu

The Roanoke River Watershed Senior Environmental Corps, which is one of the organizations listed in the table, would be a particularly good group for seniors to be involved with because it is geared towards people of that age level. It is a national nonprofit coalition of environmental, aging and volunteer organizations, which was established as the result of an agreement between the EPA and the American Association of Retired Persons. The Roanoke River Watershed Senior Environmental Corps is a statewide program, and is involved in activities such as: Adopt-A-Stream projects, mapping trails in state parks, stream corridor restoration, removal of invasive weeds, environmental education, source water protection, community gardens and forestry management. This program is part of "Virginia's Explore Park" for the Roanoke Valley. More information about the organization can be found at www.explorepark.org.

Another way for the Salem senior center to incorporate environmental and storm water education into their activities would be to have a weekly movie night centered around an environmental theme. They could show movies related to this topic such as: A Civil Action,

Chinatown, Fern Gully, Erin Brokovich, The Grey Owl, Pocahontas and Silkwood. In addition, there are many educational videos that address environmental topics, and more specifically water quality, that can be found at the local libraries.

Checklist for Senior Center

Speaker Series:

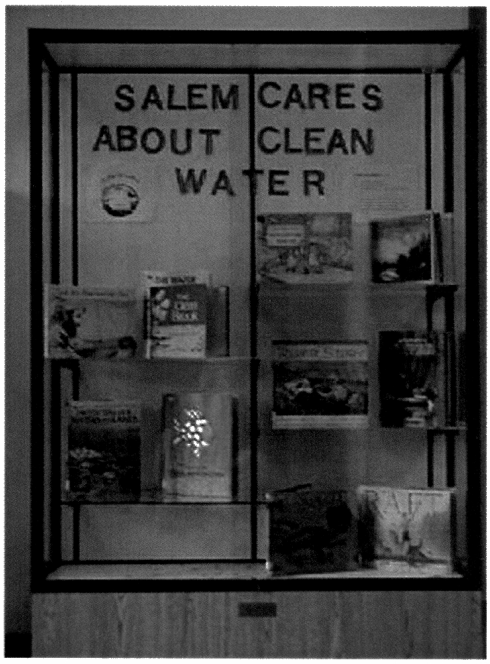
- ✓ Find Credible Speakers
- ❑ Call Speakers
- ❑ Schedule a Time for Speakers to Present
- ❑ Advertise

Field Trips / Activities:

- ❑ Schedule and Organize Field Trips / Activities
  - o Outdoor Picnic
  - o Adopt a Highway
  - o Adopt a Stream
  - o Roanoke Senior Environment Corps
- ❑ Arrange for Transportation
- ❑ Advertise

Environmental Movie Night:

- ❑ Schedule Movie Night
- ❑ Select Movie:
  - o A Civil Action
  - o Chinatown
  - o Fern
  - o Erin Brokovich
  - o The Grey Owl
  - o Pocahontas
  - o Silkwood
- ❑ Advertise
- ❑ Rent Movie



"Salem Cares About Clean Water" Display at Salem Public Library November 4, 2002

Public Library Display

The public library in the City of Salem offers a great opportunity to reach all ages of the community, and specifically young children and their parents. The library is open seven days a week, and offers many different

activities for children such as storytelling hours, a summer reading program, and various special presentations throughout the year. The library has a two display cases that are decorated differently each month according to a specific theme. We were able to reserve one of these cases for the month of November. The theme of the display case (shown right) was focused on the topic of water, water quality and the environment, and its goal was to target and capture the attention of younger children and their parents. Items in the case included some basic information about water quality and storm water, including a diagram of the water cycle, and some quick facts about water usage and pollution. Additionally, the display case also highlighted specific children's books that coordinated with this topic.

The librarians at the Salem public library, particularly Mrs. Maureen Harrill, the children's librarian, agreed to coordinate this theme into their story times and other activities during November. Also, they offered to set aside the books that are related to water, the environment, and water quality separately so that children can readily find them. The library has quite a number of books that cover a wide range of environmental topics as well as water and water quality specifically.

Having a display at the public library based on the theme of water and water quality is another way to make the citizens more aware of the water and storm water issue that the city is facing. The library story times are geared mainly towards toddlers and pre-school children, so the information we provide through the display and the overall theme will reach many parents who have children this age. Also, it will help promote discussion between older children and their parents about water and the importance of water quality.

There are many books available at the children's level that address or are related to the topics of the environment, water, and water quality. Our suggested reading list is presented in table 6.

Table 6. List of possible children's books relating to storm water management.

Title *	**Author**
Bird in the Waterfall, The	Jerry Dennis
** Clean Brook, The	Margaret Farrington
Farewell to Shady Glade	Bill Peet
** Floating House, The	Scott R. Saunders
** Flood Fish	Robyn Harbert Eversole
Franklin Plants a Tree	Sharon Jennings
** Jack, the Seal & the Sea	Joanne Fink
** Let's Explore a River	Jane R. McCauley
Magic School Bus: Wet All Over, The	Pat Relf
New Water Book, The	Melvin Berger
Our Endangered Planet: Groundwater	Mary King Hoff
Our Endangered Planet: Rivers & Lakes	Mary King Hoff
Purity or Pollution; The Struggle for Water	Pierr Pondiere
** Raft, The	Jim LaMarche
** Rainbow Fish	Beth Stephenson
** River Story	Meredith Hooper
Talk About Water	Angela Webb
** Trout Summer	Jane Leslie Conly,
** Water We Drink, The	Jill Wheeler
** Where a River Begins	Thomas Locker
Willy, A Story of Water	Jerome Spar
*All books are available at the Salem Public Library ** These books are included in the Library Display	

Checklist for Public Library Display

- ✓ Contact Public Library
- ✓ Set Date to Set up Display
- ✓ Find Related Books / Materials
- ✓ Set up Display

H. BUSINESS PLAN

Businesses play a key role in ensuring success in NPDES Phase II compliance. Salem's small and large businesses have a duty to begin taking steps to become environmental stewards. Businesses that have a great deal of paved area, like parking lots, are major contributors to runoff and therefore storm water pollutants. Vehicle and shop maintenance involve many substances that are extremely harmful to the environment. Fuel, solvents, metal shavings, lubricants, and other materials cause toxic effects if they are allowed to enter storm water runoff. In the following sections we provide some tips, ideas, and checklists to get businesses to take a look at where their responsibility lies and to get them-and keep them- on the right track.

The Facility Audit

Businesses can assess their maintenance practices through audits. The audit can be done in phases to help businesses realize where they need to improve operations. The following checklist covers water friendly maintenance practices.

The easiest way to minimize pollutants in runoff is to prevent exposure to storm water in the first place. The steps provided in the section on BMP's are ways to keep all potential pollutants within areas of a business's location where they do not come into contact with rainwater, storm water runoff, or wash water from other site activities.

Other Steps

Businesses can also take precautions for storm water pollution by reducing chemical use whenever possible and adopting different practices that involve less chemicals. Certain wastes such as oil, solvents, grease rags, wash water, and other spent liquids can be recycled. Recycling can often save businesses money in the long run. In addition businesses can explore alternative products. There are often less harmful materials and substances that are available for production.

Some of these include non-phosphorous soaps and cleaners without petroleum solvents. Finally, businesses should make an attempt to keep water out of dumpsters by keeping lids closed and check dumpsters for leaks.

Business Education

Another key to success with the business community is education. It is important that employees are informed about why they should alter everyday practices and why storm water quality is important to them. Below are a few easy, cost-effective ways businesses in Salem can get started:

- **Make presentations at safety meetings**. Prepare brief, informative presentations that can include speakers to introduce key topics. Educational videos are available or the City may be interested in putting together a slide show of its own to make the presentation more local. Regulations should be discussed and employees should know what their everyday activities affect, such as maintenance.
- **Develop tools**. Prepare laminated cards and place in vehicles describing notification procedures for spill incidents and place in company vehicles.
- **Post signs at maintenance facilities and yards**. Post good housekeeping signs wherever there is a chance that spills and leaks can occur. Make items such as drip pans and spill kits readily available at these locations to prevent spills and leaks from coming in contact with storm water runoff.
- **Involve the maintenance staff in the planned improvements**. Once staff are informed, ask them for their ideas and solutions. Involve them in designing the improvements and empower them to take action immediately when they notice a storm water quality problem in the field.

- **Recognize staff accomplishments**. Consider a recognition program for staff that regularly practice environmental stewardship, teach others by their actions and are active in developing pollution prevention solutions.
- **Make website address available**. Salem's businesses can access the website to keep informed about practices safe for the Roanoke River. The website is user-friendly and full of information for citizens of all ages.
- **Make brochure available**. The business brochure gives an outline of safe practices for landscaping, frequently asked questions by businesses, and contact information. This can be used alone as a mailer or in conjunction with an informative presentation. (Once a final website address is established, it will need to be included on the brochure.)

Rotary International

Contact the local Rotary Club and set up a date for a presentation. Rotary International is a service organization of nearly 1,200,000 business and professional leaders formed in 1905, which includes over 29,000 Rotary Clubs in over 162 countries. In Salem, Rotary meets every Thursday at 12:15 at the Salem Civic Center. The business brochure can be incorporated into the presentation. Also, make sure to point out the website Salem has, to promote storm water runoff education and outreach. Rotary is an excellent way to reach the business community and keep them informed. Contact Salem's Rotary at 540-344-9371 to set up a time and date.

Incentives for Businesses

The City of Salem can offer awards to businesses who submit plans on what they are doing to alter activities to benefit Salem waterways. Awards could be as simple as certificates, but would involve the City advertising the winner on TV, radio, and/or newspaper. This

incentive would provide free advertisements for businesses and make their practices well known to the public.

Some examples include Joe's Landscaping cutting back on fertilizer, pesticides, or chemical use. Bob's Transfer Service could perform maintenance in one confined area set up specifically to be more environmentally friendly.

Checklist for Business Outreach

- ☐ Contact Salem Rotary Club
  - Set up a time and date to meet
- ☐ Prepare a brief presentation
  - Include website address, brochures, and FAQ's
- ☐ Put together an incentive plan
- ☐ Mail brochure to businesses

I. PUBLIC ANNOUNCEMENTS

The City of Salem has to reach out to its citizens and provide information about specific activities that citizens and groups can engage in, or refrain from, in order to prevent and reduce pollution of storm water. There are a variety of opportunities for the City to get the public involved. This section focuses on letting citizens know what is going on and how they can make a difference.

Utility Bills

One way Salem can reach into every home is to use the memo lines available on the City's utility bill. Just a few brief lines can share the website address and/or a quick reminder about what citizens can do to keep their water clean and safe.

Possible options include:

1) Salem Cares! Remember the Roanoke River is only a storm drain away!

*Did you know that some seemingly simple everyday activities could be harming our water? For more information go to www...(website developed for NPDES Phase II Regulations) *Includes kids games and ways to get the entire family involved**

2) Salem Cares! Learn how you can fight storm water runoff in the Roanoke River!

Check out the website, www...., for local news and events on how Salem is cleaning up our valuable watershed! Brought to you by the Salem Planning Department and Virginia Tech.

Public Service Announcements

Public service announcements (PSAs) provide an excellent opportunity to spread the word about your campaign. Radio stations use PSAs to fill unsold advertising airtime on their stations. They are short spots, usually 15 to 30 seconds that publicize an event or issue. You can send stations prerecorded announcements or a brief written paragraph that local DJs can read aloud. PSAs educate the public about a certain issue or inform listeners about an event. They are helpful because they are free, used continuously, and often prompt further discussion about your issue.

Not only could the City's radio station play these announcements, but also all local stations could get involved. Contact local, college, and public radio stations in your area. Ask for the news director or public affairs director, or simply call the general number and ask who handles PSAs.

Some Local Stations and Numbers:

K-92, 774-9200, Contact person: Sophie- must be in writing with a contact name and number

WSLQ Q99, 387-0234, Contact person: Don Morrison- must be faxed to 389-0837

Tell them:

- Who you are—keep in mind, radio stations like to know you are a loyal listener.
- Why you are calling—share why your community needs to hear this important message now.
- Who is on the PSA, especially if he or she is a celebrity.

Send the station the PSA with a note reiterating why it is important to your community and thanking the staff for taking the time to talk with you and to listen to the PSA. Make sure you give your contact information. (Adapted from: "Take Action", a section provided by National Parks Conservation Association- www.npca.org)

More PSA Examples

Not only can local radio stations get involved with PSAs, but also they can be made at local sporting events such as Salem High School football games and Salem Avalanche baseball games.

Sample PSAs:

- *The City of Salem wants to remind you: Be smart and dispose of trash and yard clippings appropriately. Help keep our water clean and safe!*
  Salem Cares! Remember: The Roanoke River is only a storm drain away!

- *Salem Cares! Learn how you can fight storm water runoff in the Roanoke River! Check out our website at, www...., for local news and events on how Salem is cleaning up our valuable watershed! Brought to you by the Salem Planning Department and Virginia Tech.*

Salem Avalanche

Options include hosting an evening or making an announcement and providing information at table inside the stadium. This site offers a great way to reach a diverse group of citizens and share valuable information.

Contact information:
Todd- Marketing director
Phone: 540-389-3333
Fax: 540-389-9710

Salem High School Football

The athletic director, Sandy Hadaway, must approve any announcements made at the high school's football games. A large portion of Salem's population goes to these games and may become as excited about runoff as they are about the Spartans!

Contact information:
Email: shadaway@salem.k1.va.us
Phone: 540-387-2437

Newspapers

The Salem Times is another great way to access Salem's citizens. A preliminary contact has been made and the paper is happy to post any information provided by the City about what is going on in the world of NPDES Phase II Regulations. Below is article that was published in the *Times* on Thursday, November 28th, 2002 about this project.

Tech students help clean water

By JULIANNA EDWARDS
Staff Writer

Many Salem residents have no idea where our storm water goes. That's according to a survey conducted by Virginia Tech.

Students from a VT environmental planning class found more than half of the survey participants were unaware of where storm water ends up after a rain.

"Storm water gets washed down driveways and streets into the gutters and then directly into the Roanoke River. Any motor oil or antifreeze that's leaked out of your car onto your driveway gets washed down the drain into the water supply. Some people assume the water is treated and cleaned before it is fed back into the river, but according to Salem Planning Director Joe Yates, that's not the case.

"We want people to realize that anything that goes down the storm drain goes directly into the Roanoke River after it gets washed down the drain and into ditches and storm sewers," said Tech Professor Linda Prokopy, who coordinated the students' project in Salem.

Students teamed up with Salem's Department of Planning to educate the public about how storm water can pollute the Roanoke River. The river is a drinking source for many Roanoke Valley residents including Salem and Roanoke County.

The two are working to help Salem comply with the Clean Water Act mandated by the Environmental Protection Agency. The agency ordered small cities such as Salem to improve the quality of water in rivers, lakes and streams. The main thing the act requires is for the city to educate its residents about surface water pollution.

"I've seen people pull their cars up on the street over the top of a drain and then change their oil," Yates said. "Some people think it goes into the sewer and it's treated. No, it's not; it goes to a stream."

According to Prokopy there are several types of pollution Salem residents can make an effort to prevent. Fertilizer used to keep your lawn healthy can have unhealthy affects on the ecology of a river. To minimize fertilizer pollution don't fertilize your lawn right before a predicted rain storm, and also plant grasses which flourish in the Salem climate so less fertilizer and water ins necessary to keep it healthy.

Even leaves that get into the drain system can alter the natural pH of the river when they biodegrade. Yates believes the best thing Salem's residents can do is mulch their leaves.

Residents also need to make sure they dispose of motor oil properly. Oil should never be dumped down a drain. If oil spills occur on your driveway Yates says to use an absorbent material like cat litter to help soak it up.

Gina Kelly, one of the Tech students who worked on the project, said residents can help keep the river clean by going to a car wash.

"They have more regulations on what they have to do to the water before they can dispose of it. They can't just dump it directly down the drain," said Kelly.

But the main thing people need to remember, said Kelly, "is that what goes down the drain, goes into the river."

The City could also use newspapers to combine contests for children, such as coloring or poetry and public service announcements. Put the website and a brief introduction in the paper and allow children and their parents to learn more by visiting the website and signing up for the contest there.

Businesses can get free advertising in the newspaper if Salem chooses to tell citizens about what "winning" businesses are doing to be environmentally friendly and protect waterways. This incentive plan is an easy way for the City to promote compliance among businesses.

Marketing

All of the public announcements can be effective alone. However, in order for the City to more effectively spread the word and get people thinking about runoff and storm water pollution, it may want to consider investing in inexpensive products. Adding the "Salem Cares!" logo to bumper stickers, key chains, ink pens, etc, can serve as ongoing advertising and help keep the environment on the minds of citizens.

There are a number of companies that offer custom merchandise. Below are just a few companies and some of their products, along with their websites and contact information. These companies offer shopping online and/or the opportunity to request a catalog.

- **Atlas Pen and Pencil Corporation**: pens, pencils, cups, rulers, key chains, balloons, coffee mugs, sports bottles, travel accessories, T-shirts, golf balls, and many more products.
- **Website**: www.atlaspen.com
- **Contact information**: Phone- 1-800-327-3232
  Email- sales@atlaspen.com

- **Kay Media:** key chains, magnets, auto accessories, kid's products, tote bags, apparel, and much more.
- **Website:** www.kaymedia.com
- **Contact information:** Phone- 1-888-576-7766
  Email- sales@kaymedia.com

- **RMG Accessory Gear:** a diverse selection of key rings along with other products such as bottle openers, whistles, water bottle holders, and more.
- **Website:** www.tagsandchains.com
- **Contact information:** Phone- 1-888-284-4327
  Fax: 1-203-483-5297

Public Announcements Checklist

- ❑ Contact local radio stations about PSA's
- ❑ Choose a phrase to use in utility bill memo line
- ❑ Decide on marketing tools (refer to website and ordering information in public announcements section)
- ❑ Contact Ms. Hadaway about Salem High School announcements
- ❑ Contact Todd at the Salem Avalanche to discuss hosting a night or making a PSA
- ❑ Hand out brochure developed for Salem whenever possible
- ❑ Make the website known to the community (through PSA's, advertisements in newspaper, etc)
- ❑ Make press releases in newspaper

J. STORM DRAIN STENCILING

In an attempt to reduce non-point source (NPS) pollution, many communities are labeling storm drain inlets with warning messages for citizens not to dump polluting materials. Volunteer groups, in cooperation with local governments, usually conduct storm drain stenciling. The stenciled messages are simple ones that remind potential dumpers that storm drains connect directly to local water bodies, and that dumping pollutes those water bodies.

Storm drain stenciling can be an educational, interactive tool to engage citizens of all ages in pollution prevention and community involvement. Stenciling is a valuable ongoing project of citizen involvement. This project can be considered ongoing since stenciling needs to be refreshed every few years. Each time that the stenciling project needs to be refreshed, a whole new set of volunteers and outreach recipients can be reached. There is also an opportunity for media attention to increase the intensity of the project's outreach each time stenciling occurs.

Storm drain stenciling can make a powerful impression. The brightly painted messages on the storm drain inlets tell citizens what not to do and why. Media and fliers can relay information to citizens about what they can do and how to become involved.

Working with Volunteers

This section focuses on how to work successfully with volunteers. A Storm Drain stenciling activity depends heavily on volunteer labor; organizers or coordinators must be skilled in the art of recruiting, training, managing and recognizing volunteers.

Recruiting Volunteers

Spreading the word about an upcoming storm drain stenciling project can be done through many different channels. Localities can mail information on the project to civic groups, youth groups, schools, environmental clubs, chambers of commerce, or volunteer centers. Articles may be placed in local publications or news media for the general public. Also, presentations may be made at community meetings by program coordinators to encourage word-of-mouth communication and develop public service announcements.

Most storm drain projects are carried out on Saturday mornings to encourage participation. Projects such as this have been popular with Girl Scouts, Boy Scouts, 4-H clubs, environmental clubs, church organizations, neighborhood associations, and a wide range of civic and service organizations.

Training Volunteers

Before participating in a stenciling project, volunteers need training in three areas: technique, safety, and information tracking.

Technique

Instruction on how to stencil storm drains vary with the materials the city uses. Spray painting requires a different technique than rolling or brushing paint onto a stencil. Most projects have certain elements in common as listed below.

- First, the area to be labeled must be cleaned with a wire brush.
- Volunteers are warned against applying too much paint, which can make a stencil unreadable.
- Wait a few minutes before the stencil is removed to avoid paint smearing.
- Volunteers are advised to wear old clothes.

Safety

Storm drain stenciling is normally conducted in teams of two or more people. The following are common safety guidelines.

- Groups of young people must have an adult supervise each team.
- One person on each team is assigned to watch for traffic.
- All participants should wear safety vests provided by the sponsoring locality.
- If spray paint is used for stenciling, participants should also wear goggles or masks.
- If volunteers are working in the street, they must use traffic cones and/or barricades provided by the sponsoring locality.

Information Tracking

Storm drain stenciling projects provide localities with valuable information about non-point source pollution. Volunteers should note drains that are clogged with debris or show obvious signs of illegal dumping. Information such as this should be recorded on a data card similar to the one provided. The data cards are valuable to track those drains that have been stenciled and to track potential sources of non-point source pollution.

Recognizing Volunteers

To make a volunteer project truly successful, volunteers should be acknowledged for their time and hard work. Below are a few examples of way to recognize volunteers.

- Provide each participant with a certificate of appreciation and/or letter of thanks signed by the mayor or another member of the local authority.
- Distribute T-shirts, hats, badges or other gifts to each participant after the event.
- Hold a picnic or small party after the event, with refreshments donated by local merchants.
- Take pictures of stenciling teams before, during and after the event to create a pictorial record of volunteers' activity.

Getting Started

Storm Drain Stenciling is not a difficult task, but does require that specific procedures and guidelines be followed to make it a safe and successful project. As part of this report, there are several worksheets with guidelines and procedures attached, along with safety procedure and equipment. An example liability waiver is also provided and should be signed by all participants before the day of the project. Finding vendors that provide storm drain stencils and volunteers to participate in the project may be difficult and time consuming. We have eliminated some of that time by providing a list of vendors and potential volunteer groups with contact information. All of this information is provided in Appendix C.

This report is intended to provide you with all of the information needed to carry out a successful storm drain project. The only remaining obstacle is the action of the project itself. So, get together a group of volunteers, gather the needed materials, and begin your locality's storm drain stenciling project. The storm drain stenciling project will make citizens aware of storm drain pollutants and protect the quality of your watershed.

Checklist for Storm Drain Stenciling

- ❑ Contact potential volunteer groups
- ❑ Contact vendors for storm drain stencils
- ❑ Gather needed materials
- ❑ Set date for the storm drain stenciling event
- ❑ Train volunteer groups
  - o Safety
  - o How to properly stencil a storm drain
  - o Information tracking
- ❑ Contact media about upcoming event
- ❑ Stencil the storm drains in the City of Salem

K. OTHER IDEAS

Learning from the experiences of others is one way that Salem can increase the efficiency of its efforts to educate its citizens about storm water awareness, and also solicit their involvement.

"Green" Volunteer Programs

One program that worked extremely well for Greensboro, NC was the creation of the "Green Heroes" program where volunteers adopted a street, a stream, or a park. The volunteers worked to keep their designated areas clean and healthy. A similar program called "Operation Green Team" was designed in Huntsville, AL. However this program was geared more towards environmental education, with volunteers going out and telling the public about the importance of a clean environment, and also about local volunteer opportunities. Programs such as this could be easily implemented in Salem as well. Prime targets for volunteers could include: school clubs, girl scout / boy scout troops, adult service clubs, senior citizen groups, church groups, etc. These

volunteers could be involved either by helping to educate citizens, by handing out flyers, or setting up tables at the local farmer's markets and city festivals; or they could actually go out and adopt areas of Salem, such as a street or part of the river, that they would be responsible for keeping clean.

Art / Poetry Contests

Art and poetry contests are another great way to make people more environmentally aware. These contests could be held for any and all age groups and would be centered on the theme of storm water and environmental consciousness. The purpose of these contests would be to encourage people to consider the environment, what it means to them, and how they affect it.

Hazardous Waste Disposal Site

An investment that would greatly reduce the amount of toxic pollutants that enter the water system would be a hazardous waste drop-off site. While Salem does address the problem of hazardous waste with its "Hazardous Waste Day", there is a need for something more permanent. A reliable drop-off site for hazardous wastes would give residents the opportunity to dispose of paint and paint thinners, batteries, insecticides, pesticides, herbicides, and other household chemicals that they might otherwise dump outside or down the drain.

References

Phase II NPDES Storm Water Program
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Accessed on 8/27/02 and 10/3/02

Phase II NPDES – An Overview
http://www.epa.gov/npdes/pubs/fact1-0.pdf
Accessed on 8/27/02 and 10/3/02

Small MS4 Storm Water Program Overview
http://www.epa.gov/npdes/pubs/fact2-0.pdf
Accessed on 8/27/02 and 10/3/02

Who's covered? Designations and Waivers of Regulated Small MS4s.
http://www.epa.gov/npdes/pubs/fact2-1.pdf
Accessed on 8/27/02 and 10/3/02

Urbanized Areas: Definition and Description
http://www.epa.gov/npdes/pubs/fact2-2.pdf
Accessed on 8/27/02 and 10/3/02

Greensboro, North Carolina
http://www.ci.greensboro.nc.us/storm water/

Huntsville, Alabama
http://www.ci.huntsville.al.us/NatRes/program.htm#SWC

Fort Worth, Texas
http://www.ci.fort-worth.tx.us.dem.stormpg.htm

Redwood City, California
http://stopp.tripod.com/index.html

AETC Phase II Storm Water Public Education and Outreach Library CD

Virginia Tech Storm Water Survey—**APPENDIX A**

Done in cooperation with the City of Salem.

We are students from VA Tech working with the city of Salem to educate citizens about storm water drainage. Your response helps us to understand what citizens already know concerning storm water runoff. All results of this survey will be kept confidential. Please answer as truthfully as possible. Thank you for your time.

1. Are you a resident of the City of Salem, VA? **Yes** **No**

2. Are there storm drains in your neighborhood? **Yes** **No**

3. Do you know where storm drains empty?
   Treatment plant, then river **Straight into river** **Don't know**

4. Which household substances are harmful to the Roanoke River? **Soap** **Detergent**
   Yard Clippings **Fertilizer** **Motor Oil** **None of the Above**

5. Where do you wash your car?
   Home **Commercial** **Both** **Not Applicable**

6. How many times a month do you wash your car?
   0 **1** **2** **3** **More**

7. When you notice fluid or petroleum products leaking from your automobile and how long do you wait before taking it to a garage?
   Less than 1 week **1 week** **2 weeks** **Longer** **Not Applicable**

8. How many times a year do you fertilize your lawn?
   1 **2** **3** **4 or more** **Not Applicable**

9. How do you dispose of yard waste (grass clippings, leaves and brush)?
   Trash **Compost** **Side of road pickup**

10. How do you dispose of unused paint? **Trash** **Hazardous Waste drop-off**
    Not Applicable

11. How do you dispose of unused pesticides? **Trash** **Hazardous Waste drop-off**
    Not Applicable

12. Do you pick up your dog's feces? **Yes** **No** **Not Applicable**

13. Do you recycle any of these items? **Aluminum** **Glass** **Newspaper**
    Plastic **Motor Oil** **None of the above** **All of the above**

14. Which age group are you in?
    18 and under **19 to 30** **31 to 60** **Above 60**

15. What is your highest level of education? **Middle** **High** **Some college**
    2 year degree **4 year degree** **Higher than 4 year degree**

APPENDIX B

SURVEY METHODS AND RATIONALE

To begin the task of surveying the people of Salem to see what they already know about storm water management, a survey questionnaire was drafted. These questions were discussed in class and heavily edited. The overall objectives of this survey were to find out what Salem residents know about storm drains, and how their actions influence the quality of storm water run-off. The constraints in composing the survey were: (1) to alleviate possible biases and (2) to keep the overall length as short as possible. The final version of the survey had a Virginia Tech logo to give it an official look and the format was changed to improve the overall appearance. The Institutional Review Board (IRB) of Virginia Tech approved the survey.

On October 5, 2002, a pilot study was conducted at Kroger and the Farmer's Market (See Appendix B). To get a good mix of the population, we wanted to go to the eastside Kroger, which is located in a low-income neighborhood. The beginning of the month is an ideal time to do a survey because people would be receiving government assistance (food stamps, welfare, etc.). Results were not favorable at Kroger. Most people had groceries in their hands or were in a hurry to get in and get out. To add to the challenge, a group of Boy Scouts was competing for attention at the site. These obstacles pushed the group towards relocating to the Farmers Market, but it was later in the day and less people were out. Salem has a Farmers Market every Saturday. The Farmers Market usually attracts many Salem residents. A total of 25 surveys were completed that day. The survey team thought that people might have turned it down because it was a full page in length.

The class discussed the problems with the survey after the pilot, and decided to modify the survey instrument. At this time, Joe Yates requested that we include some questions and

omit others. This proved beneficial, because it led to the removal of two questions and a chance to clarify others. We decided that although surveying at Kroger could have led to a representative sample, it was not a conducive environment. Also, the class decided to change the hours that the survey team went to Salem. During the pilot study trip, which was around lunchtime, the response rate was very poor. People seemed very rushed and filling out a survey seemed to be the last thing on their mind.

The City of Salem had a Children's Festival on October 12th. Following survey revisions a different group returned to Salem to conduct a survey at the Children's Festival and the Farmers Market. It was expected that this would be a random sample because the Festival was open to anyone who wanted to participate. The response rate was high. The major obstacle was finding residents, because many people drove into Salem for the festivities. There was a heterogeneous mixture of incomes and ages at the Children's Festival. Grandparents were out, as well as young couples fairly new to parenting. Length did not seem to be a big issue. Some were surprised when they reached the bottom and there was nothing on the back or attached pages. While in the area, the group also stopped by the library to survey a few people. A total of 49 surveys were completed and 35 of these were by residents of Salem.

Joe Yates suggested that distributing the survey through Salem schools would be an effective way to reach a large and demographically diverse group of Salem residents. The idea was proposed to Mike Bryant, the Assistant Superintendent of Salem Schools, and permission was granted. A few changes were made, such as removing the residency question, for school distribution. On Tuesday October 29th, the surveys were distributed to Salem third graders at the four Salem elementary schools. They were given a brief overview of the project and instructed

to return the surveys after their parents filled them out. The response rate was exceptionally high and the schools returned 139 of the 320 surveys given to them. This is a 43% response rate.

Rationale Behind Survey Questions

Before the selection of the questions to be asked in the survey, the class discussed which segment of the population we were trying to target. Since the education program will be done within the City of Salem, the class concluded that we should only consider information from Salem residents. The first question is to ensure that only citizens of Salem are included in the results. It was also decided that in order to best educate Salem residents, it must be revealed how informed the citizens currently are on matters relating to storm drains and storm water runoff.

Our next two questions will help decide what percentage of the population needs more information about storm drain runoff. In order to decide how informed people are about substances that are harmful to the Roanoke River, a question was asked about which items could potentially harm the river. All of the options given could actually damage the river's ecosystem. Substances that are poured on the ground or road eventually end up in storm drains. Also, knowing how soon people check fluids leaking from their automobiles and where they dispose of used motor oil will help us evaluate how responsible citizens are concerning pollutants. This is important because runoff is a major contributor to storm drain pollution. Along the same lines, a question was asked about how citizens dispose of unused yard waste, paint, and pesticides. Knowing how often people fertilize their yards will help us determine if there is a large amount of excessive fertilizer running into the Roanoke River, which can promote excess algae. It is also important to know if people pick up their animal's feces.

We did not feel that it would be considerate to ask people about their annual income. Some people might take offense at the question and results would become unreliable. We

decided to use an indicator question based on education level. It was discovered that responses were coming in from all segments of the population by asking about highest level of education. The goal was to get a truly random sample. A question even asked respondents' age for the same reason.

Full Results from Survey

School Survey Results:

Table 1

	Totals	% Responding
Are there storm drains in your neighborhood?		
Yes	115	82.14%
No	24	17.14%
Where do storm drains empty?		
Treatment plant, then river	18	12.86%
Straight into the river	35	25.00%
Don't Know	86	61.43%
What is harmful to the R. River?		
Soap	76	54.29%
Detergent	90	64.29%
Yard Clippings	37	26.43%
Fertilizer	103	73.57%
Motor Oil	136	97.14%
None of the Above	4	2.86%

N=139

Demographics

Table 2

	Totals	% Responding
Which age group are you in?		
18 and under	1	0.71%
19-30	22	15.71%
31-60	114	82.86%
Above 60	2	1.43%
What is your highest level of education?		
Middle	1	0.71%
High	33	23.57%
Some College	33	23.57%
2 Year Degree	14	10.00%
4 Year Degree	31	22.14%
Higher than 4	27	19.29%

N=139

Behaviors that Contribute to Pollution in the Roanoke River **Table 3**

Where do you wash your car?	**Total**	**% Responding**
Home	24	17.14%
Commercial	57	40.71%
Both	51	36.43%
Not Applicable	11	7.86%
How many times a month do you wash your car?		
0	24	17.14%
1	82	58.57%
2	26	18.57%
3	6	4.29%
More	3	2.14%
When you notice fluid or petroleum products leaking from your automobile, how long do you wait, before taking it to a garage or fixing it?		
< 1 week	75	53.57%
1 week	22	15.71%
2 weeks	8	5.71%
Longer	21	15.00%
N/A	13	9.29%
How many times a year do you fertilize your lawn?		
1	34	24.29%
2	29	20.71%
3	6	4.29%
4 or more	15	10.71%
N/A	57	40.71%
How do you dispose of yard waste (grass clippings, leaves, and brush)?		
Trash	34	24.29%
Compost	45	32.14%
Side of road pick up	68	48.57%
How do you dispose of unused paint?		
Trash	36	25.71%
Haz. Waste Drop off	38	27.14%
N/A	64	45.71%
How do you dispose of unused pesticides?		
Trash	29	20.71%
Haz. Waste Drop off	30	21.43%
N/A	81	57.86%
Do you pick up your dog's feces?		0.00%
Yes	39	27.86%
No	27	19.29%
N/A	73	52.14%

Children's Festival Results: **Table 4**

Are there storm drains in your neighborhood?	**Total**	**% Responding**
Yes	23	65.71%
No	9	25.71%
Don't Know	3	8.57%
Which age group are you in?		
18 and under	4	11.43%
19-30	10	28.57%
31-60	18	51.43%
Above 60	3	8.57%
What is your highest level of education?		
Middle	0	0.00%
High	9	25.71%
Some College	6	17.14%
2 Year Degree	5	14.29%
4 Year Degree	9	25.71%
Higher than 4	6	17.14%
Where do storm drains empty?		
Treatment plant, then river	7	20.00%
Straight into river	11	31.43%
Don't Know	17	48.57%
Which household substances are harmful to the R. river?		
Soap	14	40.00%
Detergent	19	54.29%
Yard Clippings	12	34.29%
Fertilizer	27	77.14%
Motor Oil	33	94.29%
None of the above	0	0.00%

N=35

Behaviors that Contribute to Pollution in the Roanoke River **Table 5**

Where do you have your car's oil changed?	Total	% Respondents
Home	5	14.29%
Commercial	25	71.43%
Both	5	14.29%
N/A	0	0.00%
If you change your oil yourself, how do you dispose of the used oil?		
Pour it on the ground	6	17.14%
Motor Oil recycling center	13	37.14%
Don't Know	0	0.00%
N/A	16	45.71%
When you notice fluid or petroleum products leaking from your automobile, how long do you wait, before taking it to a garage or fixing it?		
< 1 week	20	57.14%
1 week	5	14.29%
2 weeks	4	11.43%
Longer	6	17.14%
N/A	0	0.00%
How many times a year do you fertilize your lawn?		
1	8	22.86%
2	11	31.43%
3	2	5.71%
4 or more	2	5.71%
N/A	12	34.29%
How do you dispose of yard waste?		
Trash	11	31.43%
Compost	13	37.14%
Side of road pickup	8	22.86%
Recycling Center	2	5.71%
N/A	4	11.43%
How do you dispose of unused paint or pesticides?		
Curbside Pickup	12	34.29%
Haz. Waste drop-off	13	37.14%
N/A	5	14.29%
Don't Know	5	14.29%
Do you pick your animal's feces?		
Yes	9	25.71%
No	9	25.71%
N/A	17	48.57%

N=35

Looking Back on the Survey

After the completed surveys were examined, a few mistakes were found that caused some needed information to be left out. There was great effort put into revisions and there were so many different surveys that it caused confusion. Somehow during this process an older survey was printed out to go to Salem schools. This outdated survey did not have the suggestions made by Joe Yates and included questions we had decided were unnecessary. This was unfortunate, since the majority of the responses were gathered through the school (154 of 189). Because of this error, the questions differed with the previous surveys and results could not be combined.

It was also overlooked how the age groups were broken down and surveys were not distributed to a random age group. The age category of 31 to 60 was much too large, because practically all the parents of the students fell into this. Since the survey was only distributed through the third grade, parents were roughly the same age and such a wide bracket did not distinguish well enough. Results would have been improved, if this had been left as an open-ended question. The survey might have captured a better age diversity by distribution through various grades and not just the third.

APPENDIX C

Stenciling Project Guidelines

1. Project is not recommended for children under age ten.

2. One adult is recommended for each group of 5 minors. Adult supervisors stay at the roadside to monitor traffic, stenciling, and complete tracking information data sheets.

3. Waiver forms must be signed and returned by all participants before scheduled date of the project.

4. Safety rules, guidelines, and training are explained to the leaders. Assignments and supplies will be distributed.

5. Each group receives their assignments that the team leader may need to review with the group to make sure everyone knows the locations.

6. Team leaders demonstrate how to stencil, stressing the tips they were given in training. Volunteers practice on paper bags or cardboard, which can then be recycled.

7. Groups are now ready to stencil their areas. A rain date may need to be set if the ground is too wet or wind conditions are unacceptable.

8. Information tracking sheets are to be returned at the end of the project.

Note: Volunteers need to know that damage resulting from this project will be their responsibility, so caution is encouraged. Do not paint if vehicles are too close to drains or within ten feet of the wind path; move to a more acceptable site. Keep paint closed when moving between sites.

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

Safety Procedures and Tips

1. Prior to stenciling, ALL waivers must be signed and returned.
2. Stenciling is a group activity, requiring a minimum of two people.
3. Remember to wear clothing you do not mind getting permanent ink or paint on.
4. All participants must wear safety vests.
5. One person must be on the look out for on-coming traffic at all times.
6. All storm drains stenciled should be recorded on the Tracking Sheet and returned to the captain upon completion.
7. If there is a vehicle or other private property too close to the storm drain and stenciling would risk getting ink or paint on it – do not stencil that storm drain.
8. Orally review these safety procedures with your volunteer groups.
9. Do not paint on busy streets.
10. Individuals stenciling should be at least 10 years old. There must also be one adult for every four children and at least one adult in each painting group.
11. Do not paint on sidewalk; slick painted surfaces may pose hazards to pedestrians.

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

How to Stencil Storm Drain Inlets

1. Use a wire brush to remove any dirt or scum from the area that will be painted.

2. Sweep surface free of dirt, and record any removed or observed debris on the provided data card.

3. Place the stencil above the face of the storm sewer, bending the stencil over the beam of the storm sewer. By doing this, the first line of the stencil will be on the TOP of the storm sewer and the second line will be on the BRAM. If the stencil does not fit this configuration due to a small beam, use either side of the storm drain. Experiment with how the stencil will best fit and look. Do not stencil the bottom of the storm drain.

4. One or two people should hold the stencil securely in place or tape the stencil in place with heavy tape. Be careful not to remove the stencil once in place.

5. If using spray paint or ink; shake can for one minute, hold spray can inverted about five inches from stencil. In a series of wide sweeping motions, spray one line at a time using a side to side motion until letters are uniformly covered. Do not spray too much—paint or ink will run under stencil, making the words illegible.

   If using a brush—stir contents well, brush over stencil being careful not to use too much paint or ink, as it will run under stencil making the words illegible.
   If using a roller—test that it is well inked by rolling on the pad and then testing on a newspaper. Do not put too much ink on the pad. A roller with too much ink will run making the words illegible. It is best to roll over the stencil in a back and forth motion a number of times using a constant pressure until the words are legible.

6. When finished, carefully lift the stencil.

7. If stenciled message turns out illegible, do not try to clean it off again. The mess will only get bigger. Learn from your mistakes. It's O.K.

8. Mark newly painted drains with a "Wet Paint" sign and continue to the next one.

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

Storm Drain Data Card

Please fill out one card for all of the drains that you stencil using this kit.

Name of Organization _____

Contact Person _____

Street Address _____

Daytime Phone _____ Number of Storm Drains Stenciled _____

Number of Participants _____ Date (s) of Stenciling _____

Directions: Identify waste found within six feet of each side of the storm drains. Under the appropriate location, place a check by each type of waste found. Upon completion of stenciling, record the total number of stenciled drains at each location, and total number of each type of waste found.

Please return completed data cards to your contact person

Type of Waste Found in Area	Residential Area	Business District	School/ University	Shopping Center	Total
Antifreeze/ Motor Oil Containers					
Cigarette Butts					
Fast Food Containers					
Foam Plastic Pieces					
Glass Containers/ Lids					
Grass Clippings and Leaves					
Newspapers/ Magazines					
Paint Containers					
Paper Bags					
Pet Waste					
Plastic Bags/ Wrappers					
Plastic Pieces					
Total Number of Stencils					

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

Stencil Tracking Record

Location

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Street Stenciled _____

Between Streets _____&_____

Number Stenciled_____

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

Materials

- Stencils
- Paint; either spray paint or gallon
- Paint brushes (3") or rollers and stirrers (unless using spray paint)
- "Wet Paint" signs
- Masking tape
- Drop cloths
- Gloves
- Trash Bags to gather dirt and debris
- Wire brush
- Broom and dust pan
- Paper towels and old rags
- Traffic safety vests
- Orange cones, if available
- Pencil/paper/clipboard/Data Card/Information Tracking Sheet
- Brochures about the project or storm water management
- Project fliers

Liability Waiver

I, the undersigned, being of lawful age or the parent or legal guardian of the volunteer involved in the Storm Drain Stenciling Project, in consideration of being allowed to participate in the Project, I hereby release, discharge and forever acquit _____, and its officers, agents, and employees from any and all action, causes of action, claims or any other liabilities whatsoever, known or unknown, or may arise in the future, on account of or in any way related to or arising out of my participation in the Project.

Further, I assume liability for any non-participants who accompany me.

PARTICIPANTS NAME: (Please print)

_____

AGE: _____

SIGNATURE OF PARTICPANT OR LEGAL GUARDIAN:

_____

DATE: _____

Source: Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

Vendors

Virginia Adopt-A-Stream Program
Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, VA 23219

This government sponsored program provides free storm drain stenciling kits to its participants consisting of: trash bags, gloves, safety vests, first aid kits, hand-sanitizer, instruction and promotional documents, stencils, whisk broom, and white or blue spray paint.

Bennett's Marking Products
11379 Trade Center Drive Suite # 350
Sacramento, CA 95742
(916) 852-6065
(916) 852-0103/ fax

California Stamp Co.
1492 5th Avenue
San Diego, CA 92101
(619) 232-5037
(619) 232-4341/ fax

Hitt Marking Devices
3605 West MacArthur Blvd. Suite # 709
Santa Ana, CA 92704
(800) 969-6699
(714) 979-1405
(714) 979-1407/ fax
www.hitmarking.com

Markor Marketing Systems Inc.
298 Fallbrook Avenue
Fresno, CA 93711
1-800-221-8401
559-436-8401
Fax: 559-436-8404
www.markor.com

Patrick & Co.
611 Mission St.
San Francisco, CA 94105
(415) 392-2640
(415) 546-4952/ fax
www.patco.net
mailto:credit@patco.net

Valley Rubber Stamp Co.
1208 West Magnolia Blvd.
Burbank, CA 91506
(818) 848-3815
(818) 848-2553/ fax

Potential Volunteer Groups

Appal Corps, Virginia Tech Service Learning Center
Contact: Perry Martin, Assistant Director (540) 231-6964
Description: Provides site visits to areas in Appalachian communities to do manual labor type projects.

Center for Community Service, Roanoke College
Contact: William Greer, Director of Community Service (540) 375-2300
Description: Provides multiple service opportunities for College students.

Environmental Club, Salem High School
Contact: David Turk, Advisor dturk@salem.k12.va.us

Description: Environmental Club is a service organization committed to the education and involvement of Salem High School students in environmental issues. Past projects have included: a valley wide conference on environmental issues, recycling program at school, and programs to develop student and community interest in the environment. Students meet monthly during the activity period and also twice a month after school. This is a working club with many concerns, and students are committed to improving school and community awareness of environmental concerns.

Resources

Department of Conservation & Recreation, Adopt-A-Stream Program http://www.dcr.state.va.us/sw/adopt.htm 21 Nov 20002.

Storm Drain Stenciling in North Carolina: Instructions for Volunteers. www.bae.ncsu.edu/bae/programs/extension/wqp/smp-18/stormdrain/volunteer.html 29 Oct 2002.

Storm Drain Stenciling in North Carolina: A Local Government's Guide to Storm Drain Stenciling. www.bae.ncsu.edu/bae/programs/extension/wqp/smp-18/stormdrain/localgov.html 29 Oct 2002.

Texas Natural Resource Conservation Commission. Storm Drain Stenciling: A Manual For Communities, 2000.

APPENDIX D

Brochure 1: Business Outreach

Brochure 2: Resident Outreach