***Section Eight(b)***

**Urban Runoff**

**2011-2016 NPS Pollution Management Plan**

**Statewide Programs**

**Introduction**

The Arkansas Department of Environmental Quality (ADEQ) identifies Urban Runoff as a source of contamination in its most current List of Impaired Waterbodies. As the Arkansas Natural Resources Commission’s (ANRC) Nonpoint Source (NPS) Pollution Management Plan is to be used in conjunction with ADEQ’s List of Impaired Waterbodies, the agency has changed the title from Household and Business Activities to Urban Runoff to reflect ADEQ’s terminology.

The Urban Runoff Statewide Program addresses pollutants that can be generated by households and businesses not required to obtain National Pollution Discharge Elimination System (NPDES) permits, whether they are located in rural or urban counties. The most recent National Water Quality Inventory reports that runoff from urban areas is the leading source of impairments to surveyed estuaries and the third largest source of water quality impairments to surveyed lakes (EPA, 2004).

**Onsite Waste Disposal:** The Arkansas Department of Health (ADH) regulates onsite wastewater treatment systems. ADEQ delegates a portion of its regulatory authority for the Underground Injection Control (UIC) Program to ADH under a Memorandum of Agreement as it relates to septic tanks and subsurface distribution systems, excluding household systems, which are considered Class V injection wells. Rules and regulations pertaining to Sewage Disposal System Designated Representatives and Installers (Act 402 of 1994) provide standards for installation of septic systems and certification requirements for system designers and installers. Some types of systems may also require a NPDES permit from ADEQ. ADH has also developed an Alternate Systems Manual to complement these rules and regulations, which provides for the installation of alternatives to the standard septic tank system in special situations. This NPS Pollution Management Plan is developed to complement and support implementation of those rules and regulations using education and other voluntary activities.

Ground and surface water pollution are major considerations when septic tanks are used. The main pollutants from septic tanks are pathogens such as viruses, nutrients, and organics. Systems used in undersized lots or where soils are unsuitable for proper treatment of wastewater are subject to undesirable conditions such as widespread saturation of the soil and malfunction of the treatment system. Malfunctioning systems may result in untreated sewage leaching into groundwater or running into streams or roadside ditches, contaminating surface water.

Currently, ADEQ does not identify any streams or lakes in Arkansas as being impaired by pollutants from onsite wastewater treatment.

**Potential Pollutants**

The potential NPS pollutants for urban activities are pathogens, nutrients, a variety of household chemicals, and sediment. Suspended sediment is the primary pollutant in urban runoff which also contains oil, grease, chemicals from turf management, road salts, metals, pathogens, and toxic chemicals from automobiles among others.

**Pathogens:** While most microorganisms in wastewater are harmless, many pathogenic (disease-causing) organisms may be present. The interactions of these organisms with soil are more complex and less well understood than the reactions of nitrogen and phosphate. Pathogens in wastewater include bacteria, viruses, protozoa, and helminthes (worms). Helminthes are approximately the size of sand particles, protozoa the size of silt particles, bacteria the size of fine silt and coarse clay, and viruses the size of very fine clay. Due to the relatively large size of helminthes and protozoa their movement through soil pores is usually limited. Bacteria and viruses have a much greater potential for movement and have been the principal causes of disease outbreaks related to groundwater contamination by septic systems (Cogger, 1995).

One route of pathogens to humans from onsite wastewater systems is contamination of wells through groundwater. Systems must be located an appropriate distance from wells and property boundaries. Systems must also be designed so that they are compatible with the geological attributes of the area. If the groundwater level is high (less than 4 feet below the surface) or if the soil is extremely permeable, the soil will not be effective in removing pollutants and the groundwater may become contaminated, resulting in a public health hazard. Many diseases, including infectious hepatitis, typhoid fever, dysentery and some forms of diarrhea, are caused by water and food contaminated with sewage and can easily be spread by flies. Septage solids pumped from systems must also be disposed of in a proper fashion to avoid contamination of surface water or transfer of pathogens to humans via animals and insects.

**Runoff from Homes and Businesses:** Runoff from home and small business land surfaces can carry sediment and suspended solids to streams, along with associated fertilizers and organic carbon. These sources of sediment can impair designated water uses. In addition, toxics such as petroleum residues, exhaust products, pesticides/herbicides, metals, or litter may all be transported in runoff from lawn maintenance or improper handling of chemicals used by households and small businesses, parking lots, commercial areas, and other disparate sources during storm events. These pollutants typically enter surface waters via runoff without undergoing treatment.

**Sediment:** Soil erosion is the detachment and movement of soil particles from the soil surface. Soil loss by erosion is not sediment yield; however, it creates a potential for sediment yield. Sediment yield is the amount of eroded soil material that actually enters bodies of water. Soil loss is equal to the tonnage of soil being moved by erosion and re-deposited in other locations, such as in parking areas, drains, yards, and other locations. Frequently, some of these eroded soil materials, along with the undesirable chemicals dissolved in runoff water or attached to soil particles, are transported by the runoff water from land surfaces into waterbodies. The percentage of soil that moves into bodies of water from eroding urban lands is variable and depends on the:

* size of soil particles being transported;
* slope of the land;
* distance to the nearest waterbody;
* density of the vegetation the sediment has to move through;
* shape of the drainage way; and
* intensity of the rain event.

Sediment can smother benthic organisms, interfere with photosynthesis by reducing light penetration, and may fill in waterways, hindering navigation and increasing flooding. Sediment particles often carry nutrients and pesticides and other organic compounds into the waterbodies, including:

**a. Nutrients:** The problems resulting from elevated levels of phosphorus and nitrogen are well known and discussed in detail in the agriculture section of this plan. Excessive amounts of nutrient loading to aquatic ecosystems can result in extreme plant and algae growth in a waterbody, changes in water quality, and a decline in the number of desirable fish species. Nutrients are a particular concern in areas defined as Nutrient Surplus Areas (NSAs). The agriculture section of this plan has a more detailed description of NSAs.

**b. Oxygen-demanding Substances:** Proper levels of dissolved oxygen (DO) are critical to maintaining water quality and aquatic life. Decomposition of organic matter from lawn waste, construction waste (e.g., do-it-yourself construction projects), and other sources by microorganisms may deplete DO levels and result in the impairment of a waterbody. Data shows that runoff with high concentrations of decaying organic matter can severely depress DO levels after storm events (EPA, 1983).

**c. Petroleum Products:** Petroleum hydrocarbons are derived from oil products, and the source of most such pollutants found in runoff is vehicle auto and truck engines that drip oil. Many do-it-yourself auto mechanics dump used oil directly into storm drains (Klein, 1985). Concentrations of petroleum-based hydrocarbons are often high enough to cause mortalities in aquatic organisms.

**d. Other Household Chemicals:** Potentially hazardous household products include paints, cleaning solvents, polishes, pool chemicals, pesticides, and other chemicals. Many of these products contain substances such as sodium hypochlorite, petroleum distillates, phenol, cresol, ammonia, and formaldehyde (NRDC, 2001). If improperly disposed of or accidentally spilled, these chemicals may end up in surface or groundwater. The impact of these chemicals on water quality varies depending on the chemical, but can be significant.

**Water Quality/Program Goals**

Waters of the state which are not fully supporting of designated uses have been identified by ADEQ in its most current List of Impaired Waterbodies. Siltation/turbidity of reservoirs and streams has been identified as the largest source of NPS pollution. While urban runoff NPS pollution is not currently identified as a source of these pollutants in the waters of the state, malfunctioning, or improperly installed onsite wastewater treatment systems may contribute to pathogen contamination, especially around lakes with a high density of residences and businesses. Additionally, other urban attributes such as the activities that take place in and around households and small businesses may contribute to sediment/turbidity.

**The ultimate goal of the urban runoff pollution prevention**

**statewide program is that through public awareness, education, training, and other voluntary programs, household and small**

**business sources of NPS pollution will never be identified as contributing to impairment of the waters of the state.**

Long- and short-term programmatic objectives for the elements of this statewide program are given in the following sections.

**Objectives and Milestones**

**Onsite Wastewater Treatment Systems:**

8(b).1. Assist ADH in evaluating and demonstrating promising alternatives to the standard septic tank/leach field systems as resources allow.

**Timeline for Milestones:** October 2011 – September 2016

8(b).2. Use Geographical Information Systems (GIS) analysis and special assessments to identify critical areas. Utilize the information to target additional education opportunities for onsite wastewater treatment system outreach and awareness programs in cooperation with the ADH.

**Timeline for Milestones:** October 2011 – September 2016

8(b).3. Assist ADH in the development and implementation of outreach and awareness programs for home owners and businesses on BMPs for the proper operation and maintenance of onsite wastewater disposal systems.

**Timeline for Milestones:** October 2011 – September 2016

8(b).4. Work with ADH to increase awareness of sources of funds available for repairing malfunctioning or improperly installed septic systems.

**Timeline for Milestones:** October 2011 – September 2016

**Household & Small Businesses Use of Chemicals and Fertilizers:**

8(b).5. Assess the impact of household and business use of fertilizers, pesticides, and other common products that do not require permits but can affect water quality in order to more effectively target outreach and awareness programs aimed at increasing use of BMPs as resources allow.

**Timeline for Milestones:** October 2011 – September 2016

8(b).6. Encourage cooperating entities to work together to maintain a shared library of BMPs for the use, handling, storage, and disposal of chemicals, oils and grease, cleaning agents, adhesives, lawn products, etc. that is readily accessible to households, municipalities, employers, and others.

**Timeline for Milestones:** October 2011 – September 2016

8(b).7. Continue to develop and implement targeted education programs for specific products and high-impact audiences as resources allow (e.g., fertilizer and pesticide use, storage, handling, and disposal for street and road crews, public utilities, golf course managers, and independent lawn maintenance crews).

**Timeline for Milestones:** October 2011 – September 2016

8(b).8. Continue to maintain and implement broad-based education programs aimed at increasing awareness and disseminating BMPs to urban and rural households and businesses (e.g., HOME\*A\*SYST, URBAN\*A\*SYST).

**Timeline for Milestones:** October 2011 – September 2016

8(b).9. Existing hazardous waste and pesticide container collection programs aimed at agricultural producers will be encouraged to accept containers from households and businesses as well.

**Timeline for Milestones:** October 2011 – September 2016

**Program Tracking and Evaluation**

**Onsite Wastewater Treatment Systems:** Currently, no stream segments are identified as being impaired by onsite wastewater disposal. In the interim, the effectiveness of the onsite waste disposal component of this statewide program can be tracked by the agencies conducting education programs through the use of attendance logs and program evaluation. Program evaluation methods will be specified in grant agreements as appropriate. ANRC may require pre- and post-project evaluation in project agreements as resources allow.

**Household Chemicals and Fertilizers:** Educational programs concerning household chemicals and fertilizers can be evaluated by the agencies conducting the education programs through attendance logs and attendee post-program evaluations. Hazardous waste collection programs can be evaluated by the volume or mass of hazardous waste collected by the program administrators. ANRC may require pre- and post-project evaluation in project agreements as resources allow.

**Brief Summary of Institutional Context**

**Onsite Wastewater Treatment Systems:** ADH is the regulatory agency for onsite wastewater treatment systems. To install or repair septic systems in Arkansas a person must be licensed by ADH. Site inspections by an ADH representative for new septic systems are mandatory. Property owners are responsible for the assurance of proper function of onsite wastewater treatment systems. Problems are dealt with in a site-specific manner following property-specific complaints. After a complaint is filed a check is performed on the property in question. If a violation of law is found, then a notice of violation is issued.

The University of Arkansas Division of Agriculture Cooperative Extension Service, as the educational arm of the Division of Agriculture, promotes public awareness and provides information and training programs to residents concerning proper operation and maintenance of onsite wastewater treatment systems through its HOME\*A\*SYST program.

**Household Chemicals and Fertilizers:** Management of household chemical and pesticide NPS pollution can best be achieved by an effective information, education, and public awareness program concerning the potential hazards of such chemicals. In addition, local hazardous chemical pickup and disposal programs have been successful in the elimination of hazardous chemicals from the environment. Continuation of these programs is necessary for the successful prevention of water quality degradation resulting from household chemicals and fertilizers.

U.S. Environmental Protection Agency (EPA) requires operators of large, medium, and regulated small municipal separate storm sewer systems (MS4s) to obtain authorization to discharge pollutants under an NPDES permit. Under Phase II requirements, permitted small MS4s are required to develop plans for public education and outreach in order to implement a public education program. These programs should include components to distribute educational materials to the public such as flyers inserted with municipal water bills, or equivalent outreach activities about the impact of stormwater discharges on waterbodies and the steps that the public can take to reduce pollutants in stormwater runoff. The materials and activities planned under this statewide program help provide tools to small cities required to obtain an NPDES stormwater permit (MS4) to do public education and outreach as well as other communities and rural areas that voluntarily conduct public education and outreach programs.

In collaboration with regional planning commissions, the University of Arkansas Division of Agriculture Cooperative Extension Service is working with communities subject to Phase II small MS4s NPDES permit requirements to conduct construction education and technical assistance programs in Arkansas.

**Cooperating Entities**

Cooperating entities are listed and described in the cooperating entities section of the 2011-2016 NPS Pollution Management Plan.

**Federal Consistency**

Federal consistency is not anticipated to be an issue with this statewide program. If there are federal consistency issues, ADH and/or ADEQ will work with the relevant federal agency to achieve consistency.

**Onsite Wastewater Disposal System**

**Management Measures and BMPs**

The following management measures and BMPs are recommended for onsite wastewater disposal systems. However, first and foremost, onsite disposal systems must be in conformance with the rules and regulations of ADH.

**Permitting Requirements:** Contact the county health department for regulations and a list of currently approved designated representatives and installers.

**Planning and Designing Onsite Wastewater Treatment Systems:** Site planning, design, installation, operation, and maintenance must be focused on reducing the environmental impact of the release of treated domestic wastewater into the environment.

Complete a layout of the site including dimensions and locations of roads, buildings, neighboring residences, wells, and drainage-ways.

**Identify Critical Properties:** As the properties are identified, decisions regarding the design and construction can be made. These properties include:

* topography;
* soil conditions;
* geology; and
* drainage.

To avoid contamination of drinking water systems and other problems, soil absorption systems must be situated at prescribed distances from wells, surface waters, springs, and property boundaries.

**Locate Adequate Absorption Field:** Critical to the location of the absorption field is the topography of the site. Depression areas and floodplains must be avoided since these areas may become saturated and be unable to adequately treat the effluent flow. A “useable area” of soil absorption should be located in an area of diverging flow. Practices associated with absorption field placement are:

* avoiding where water naturally converges;
* placing absorption field parallel to contour; and
* determining exact slope of the site.

**Pre-treat Effluent:** When adequate pre-treatment is provided, the overall level of treatment is improved in the soil system and absorption field.

**Selection of Onsite Wastewater System Based on Minimum Technical Standards:** Septic system design, construction requirements, in relation to the minimum depth of groundwater, minimum distances from water sources, and maximum percolation rates for soils for absorption fields and alternative systems are established by ADH.

**Installation of Appropriate System:** There are several designs of onsite wastewater treatment systems. Alternatives to conventional gravity-flow septic systems may be considered in the case of system failure or substandard site conditions.

**Gravel-less and Chamber Systems (e.g., low pressure pipes (LPP) systems):** These systems have the following design features:

* shallow placement;
* narrow trenches;
* continuous trenching;
* pressure-dosed with uniform distribution of the effluent;
* design based on aerial loading; and
* resting and re-aeration between doses.

**Mound Systems:** Their main purpose is to provide additional treatment to the wastewater before it enters the natural environment. Mound systems are designed to overcome site restrictions such as:

* slow or fast permeability soils;
* shallow soil cover over creviced or porous bedrock; and
* high water table.

**Intermittent Sand Filters:** They are a viable alternative to conventional methods when soil conditions are not conducive for proper treatment and disposal of wastewater through percolation beds/trenches. Sand filters may be considered in sites that have:

* shallow soil cover;
* inadequate permeability;
* high groundwater; and/or
* limited land area.

**Recirculating Sand Filters (RSFs):** Because they require less land area than intermittent (single-pass) sand filters and do not require highly trained operators, RSFs are often used to treat wastewater collected from clustered residences and small communities.

**Home Aerobic Systems:** Aerobic systems are similar to septic systems in that they both use natural processes to treat wastewater. But unlike septic (anaerobic) treatment, the aerobic treatment process requires oxygen. Aerobic treatment units, therefore, use a mechanism to inject and circulate air inside the treatment tank. This mechanism requires electricity to operate. For this reason, aerobic systems cost more to operate and need more routine maintenance than most septic systems. However, when properly operated and maintained, aerobic systems can provide a high quality wastewater treatment alternative to septic systems. Aerobic systems should only be used in conjunction with a maintenance contract.

**Fine Bubble Aeration:** Fine bubble aeration is a subsurface form of diffusion in which air is introduced in the form of small bubbles to aid or enhance the treatment of wastewater.

**Composting Toilet Systems:** A composting (or biological) toilet system contains and processes excrement, toilet paper, carbon additive, and sometimes, food wastes. Unlike a septic system, a composting toilet system relies on unsaturated conditions where aerobic, or air-requiring, bacteria and fungi break down wastes. Tightening wastewater regulations, growing awareness of pollution sources, compatible gray-water systems, and micro-flush toilets are making them a viable alternative to septic systems and central sewage treatment plants in many areas, particularly those with poor soil drainage and close proximity to surface water and groundwater.

**Alternative Sewers:** Alternative sewers should be considered as a possible option for groups of homes and businesses in areas where they can cost-effectively fulfill the health and environmental goals of the community.

**Decentralized Wastewater Treatment:** A decentralized system employs a combination of onsite and/or cluster systems and is used to treat and dispose of wastewater from dwellings and businesses close to the source. Decentralized wastewater systems allow for flexibility in wastewater management. Different parts of the system may be combined into “treatment trains,” or a series of processes to meet treatment goals, to overcome site conditions, and to address environmental protection requirements.

**Maintenance of Onsite Wastewater System:** Proper management ensures functional septic design, cleaning and repair.

**Reduce Flow Into the Wastewater Treatment System:** Keep water usage well below the septic system's “daily designed flows.” Consistently exceeding these flows impacts both the volume and quality of wastewater that enters your absorption field.

**Minimize the Amount of Solids Deposited into the Wastewater Treatment System:** Overburdening a septic system with solids will, at best, necessitate more frequent pumping of your tank. At worst, such overloading will cause the carry-over of particulate solids into your absorption field, leading to premature absorption field failure.

**Avoid Putting Chemicals in the Treatment System:** Adding chemicals such as household cleaners and toxic substances (paint, solvents and pesticides) kills off bacteria whose life activities purify wastewater. Chemicals can also clog the absorption field and damage soil structure.

**Regularly Pump Out Septic Tanks:** All septic tanks need to be pumped out on a regular basis. Pumping is essential to maintaining a well-functioning system and preventing premature system failure.

**Routine Onsite Wastewater System Self-Inspection:** Septic system inspections are necessary to assess the current condition of the system, uncover potential or emerging problems and predict future system performance. Homeowners should routinely self-inspect their systems and maintain records on their systems, including the following elements:

* **maintain adequate records:** The homeowner should keep the following documents: permit application and any attached reports (e.g., soil tests), the permit, age of the septic system, a record of all maintenance (e.g., pumping) and ADH inspection reports.
* **keep the septic tank accessible:** The homeowner should know the location of the septic tank cover and keep it free from being covered by soil or debris.
* **inspect the absorption field:** The homeowner should regularly visually inspect the absorption field for:
* signs of system failure (odors, mushy spots, surfacing effluent);
* surface water (indicative of poor location);
* proper effluent distribution; and the
* existence of potentially harmful trees/shrubs in the absorption field vicinity, or other absorption field hazards (e.g., heavy equipment, patios, blacktopped areas, etc.).

**Best Management Practices**

**BMPs for Gas Stations, Auto Repair Shops, Auto Body Shops, Car Dealerships, Mobile Fleet Managers, Airplane Maintenance and Mobile Fleet Washing Services.**

Many common vehicle maintenance and washing routines contribute to environmental pollution. Washing a vehicle or pouring used motor oil into a gutter or storm drain pollutes the environment. Water runoff from streets, parking lots, and driveways picks up oil and grease dripped from cars, asbestos worn from brake linings, zinc from tires, and organic compounds and metals from spilled fuels. These chemicals drain into surface waters, harming aquatic life. Oil and grease, for example, clog fish gills and block oxygen from entering the water. If oxygen levels in the water become too low, aquatic animals die.

**Cleaning/Degreasing Engines and Equipment, Auto and Truck Drive Trains and Airplanes (including Landing Gear):** Clean with or without soap, no storm drain disposal permitted, requires treatment before allowed to be discharged to the sanitary sewer system, should be cleaned on a wash pad, requires discussion with facility operator.

**Truck Trailer and Boat Cleaning (Exterior only – Food Related):** Sweep, collect, and dispose of debris. Use dry cleaning methods as much as possible. Food residue must be disposed of as garbage or sent to the sanitary sewer. Avoid hosing down trailer. Wash water should not be discharged to the storm drain; it should be pumped to the sanitary sewer.

**Truck Trailer Cleaning (Interior only – Where Toxic Substances May Be Encountered):** If toxic materials have been shipped in the trailer and there has been a spill, do not hose down the spill. Take immediate action to prevent the spread of the material and protect nearby storm drains.

**Fleet Vehicle Washing (Exterior Only Removing Mainly Soil – With Soap):** Use wash pads that capture the wash water and discharge it to the sanitary sewer. Solids separation is required before disposal. Ideally, a separate wash area that captures the wash water should be established. Use of temporary wash pads that can be drained to the sanitary sewer is also acceptable.

**Seal Storm Drains:** Wash water runoff and excess soapy water must be collected and pumped or otherwise discharged as follows:

* pump into sanitary sewer system clean-out/sink or into an onsite private sanitary sewer manhole and verify with the facility manager that it is not a storm drain manhole;
* solids separation will be required before disposal to prevent clogging system;
* wash water may be discharged into a landscaped or soil areas;
* discharge should be directly to an area sufficient to contain all wash water;
* discuss this practice with the property owner;
* acceptable for minimal discharge flows only; and
* repetitive use of the same area or excessive wash volume to the same area may be illegal. (Note that soapy wash water may adversely affect landscaping).

If disposal to the sanitary sewer and/or a landscaped area is not possible, then contract with a company capable of hailing the wash water off-site to an authorized disposal site.

**Mobile Auto Detailing and Cleaning Boat (Infrequent, Light Cleaning, Rarely at Same Location; Removing Mainly Soil, With Minimum Water Volume) – With Soap:** Minimal runoff may remain on paved surfaces to evaporate. If there is insufficient water volume to reach the storm drain, seal the storm drain and pump the water to the sanitary sewer. For landscaped or soil areas, discharge should be directed to an area sufficient to contain the water. Discuss this practice with the property owner. Acceptable for minimal discharge flows. Repetitive use of the same area or excessive wash volume to the same area may be illegal

**Boat Cleaning (Where Paint Chips Are Being Removed in Preparation for Painting):** Filtered wash water must be discharged to sanitary sewer. Contact the local wastewater treatment plant for more information. Dispose of paint particles appropriately according to paint type (e.g., if paint is lead-based, copper-based, or contains Tributyltin or PCBs, consult the local wastewater treatment plant and hazardous waste for information on disposal of hazardous waste). If non-hazardous, material may be disposed of as solid waste after filtered paint particles have dried. This BMP is not intended to address the disposal of paint waste.

**Shop Area Cleaning (Interior Cleaning of Vehicle Shop Areas and Paint Booths):**

Do not hose down your shop floor into streets or parking lots. It is best to dry sweep regularly. Use nontoxic cleaning products. Baking soda paste works well on battery heads, cable clamps, and chrome. Mix the soda with a mild biodegradable dishwashing soap to clean wheels and tires. For windows, mix white vinegar or lemon juice with water. To reduce or eliminate the generation of waste fix sources of drips or leaks where possible. Routinely inspect the engine compartment and regularly replace worn seals on equipment.

To avoid or control spills and leaks do the following:

* prepare and use easy to find spill containment and cleanup kits. Include safety equipment and cleanup materials appropriate to the type and quantity of materials that could spill;
* pour kitty litter, sawdust or cornmeal on spills;
* change fluids carefully. Use a drip pan to avoid spills. Prevent fluid leaks from stored vehicles. Drain fluids such as unused gas, transmission and hydraulic oil, brake and radiator fluid from vehicles or parts kept in storage. Implement simple work practices to reduce the chance of spills;
* use a funnel when pouring liquids (like lubricants or motor oil) and place a tray underneath to catch spills. Place drip pans under the spouts of liquid storage containers; and
* clean up spills immediately.

**BMPs for Building Maintenance Departments, Property Owners, Service Stations, Fast Food Restaurants, Auto Repair Shops, Window Washing Services, and Mobile Washing Services.**

Many common surface cleaning and washing routines contribute to environmental pollution. Washing buildings or paved surfaces into a gutter or storm drain pollutes the environment. Water runoff from buildings, streets, parking lots, and driveways can pick up sediment, debris and oil. These pollutants drain into surface waters, harming aquatic life. Oil and grease, for example, clog fish gills and block oxygen from entering the water. If oxygen levels in the water become too low, aquatic animals die.

**Pressure Washing Drive-throughs, Driveways, Parking Garages, and Service Stations:** Storm drains must be protected from water runoff. Sweep, collect, and dispose of debris. Dry clean oil spots with absorbent and dispose of absorbent in a legal manner. Vacuum/pump wash water to the sanitary sewer. Wash water disposal options should be discussed with the facility's operator/site manager.  
  
It is best to discharge through an oil/water separator. Do not use an oil/water separator intended to capture cooking oil. Although pretreatment may not be required, contact the local wastewater treatment plant for more information.

**Washing Painted Buildings (Where Lead-Based or Mercury Additive Paints are of Concern):** Storm drains must be protected from water runoff. Vacuum/pump wash water to a holding tank.

**Washing Painted Buildings (To Remove Paint or Prepare Surface for Painting):** These BMPs do not address the disposal of paint.

**Masonry Efflorescence (Where Acid Wash is used to Remove Mineral Deposits on Masonry):** Storm drains must be protected from water runoff. Rinse treated area with alkaline soap to neutralize acid residue. Direct rinse water to a landscaped/soil area.  
  
**Collect Wastewater:** Neutralize wash water to a pH between 6 and 11. Pump to a sanitary sewer clean-out at the site, into a sink or toilet, or contact the local wastewater treatment plant.

**Wash Down of Restaurant Alleys, Grocery Dumpster Areas (Outdoors):** No discharge from this activity is allowed to enter storm drains. Dry sweep and clean only, if possible. Use rags, absorbents or dry sweeping compound. Dry sweep first. Seal storm drain(s). Wash area then vacuum or pump wash water to the sanitary sewer. Screen wash water to prevent clogging system.

**Wash Down Sidewalks and Plazas (With Soap):** Wash water must go to sanitary sewer. Sweep, collect, and dispose of debris and/or absorbent. Wash area then vacuum or pump wash water to the sanitary sewer. The BMPs in this section do not apply if there has been oil or other hazardous material spilled onsite. In case of a spill, contact the local fire department for guidance.

**Wash Down Sidewalks, Plazas, Driveways, Drive-Through Window Areas with Light Oil Build Up (Frequently Cleaned, Without Soap):** Sweep, collect, and dispose of debris and/or absorbent. Dry sweep oil spots with absorbent and dispose of absorbent in garbage. Place oil-absorbent boom around storm drain. Wash water may go into storm drain through oil absorbing boom. No oil sheen may be visible on the water flowing into the storm drain.

**Washing Building Exteriors and Walls (With Soap):** No storm drain disposal of wash water is permitted. It must be discharged to sanitary sewer or soil. There may be some unavoidable evaporation from paved surfaces. Use wash pads that capture the wash water and discharge to the sanitary sewer. Solids separation is required before disposal. Ideally, a separate wash area that captures the wash water should be established, or the use of temporary wash pads that can be drained to the sanitary sewer is also acceptable.

**Graffiti Removal, Using Wet Sand Blasting Methods:** Minimize quantity of water used. Runoff should be directed to landscaped or soil area. Filter runoff through the boom to keep sand out of storm drains. Sweep debris and sand. Dispose of all waste to avoid future runoff contamination.

**Graffiti Removal, Using High-Pressure Washing and Cleaning Compound:** Direct wash water runoff should be directed to landscaped or soil area. No runoff can go into storm drain. Seal storm drains and vacuum/pump wash water to the sanitary sewer. Contact the local wastewater treatment plant for guidance, as harsh cleaning compounds may require pretreatment.

**Wash Sidewalks and Plazas (With No Oil Deposits) – Without Soap:** Sweep, collect, and dispose of debris. Wash water may go to storm drain.

**Washing Building Exteriors and Walls – Without Soap:** Direct wash water runoff to soil or landscaped areas. Wash water may go to storm drain. Sealing the storm drain with a fabric filter is recommended to capture soil in the wash water.

**Washing Painted Buildings (Paint Intact) – Without Soap:** If painted after 1978, direct wash water runoff to soil or landscaped areas. Seal the storm drain with a fabric filter to capture paint particles in the wash water. Never allow direct discharge to storm drain. Dispose of all collected particles in garbage. These BMPs do not address washing buildings with paint prior 1978.

**Car Lot Rinsing for Dust Removal – Without Soap:** If rinsing dust from exterior surfaces using water only, and no soap/solvent, discharge runoff to storm drain or to landscaped or soil areas. Prevent contamination of the runoff by not allowing it to run through oil deposits on the pavement or in the gutter.

**BMPs for Bakeries, Food Producers and Distributors, Grocery Stores, and Restaurants.**

The byproducts of food-related cleaning can harm the environment if they enter the storm drain system. Food businesses can cause harm by putting food waste in leaky dumpsters, not cleaning up outdoor food or chemical spills, or by washing outdoor spills into the storm drain system. Other routine activities such as cleaning oily vents and operating and maintaining delivery trucks are sources of pollution, unless proper precautions are taken. When it rains, oil and grease not properly disposed of may be washed into the storm drain system. Oil and grease, that makes its way into the environment, can block oxygen from entering the water. Additionally, toxins found in oven and floor cleaners can, in high concentrations, harm aquatic life.

**Conduct Employee and Client Education:** Employees can help prevent pollution when you include water quality training in employee orientation and reviews. Promote these BMPs:

* storage containers should be regularly inspected and kept in good condition;
* place materials inside rigid, durable, water- tight and rodent-proof containers with tight fitting covers;
* store materials inside a building or build a covered area that is paved and designed to prevent runoff from entering storm drains;
* place plastic sheeting over materials or containers and secure the cover with ties and weighted objects; (Not appropriate for storing liquids.)
* post BMPs where employees and customers can see them. Showing customers you protect the environment is conducive to good public relations;
* explain BMPs to other food businesses through your merchant associations or chambers of commerce; and
* raise employee and customer awareness by stenciling storm drains near the work place.

**Cleaning Restaurant Floor Mats, Exhaust Filters, Etc.:** Do not wash restaurant or food industry-related equipment outdoors and allowing wash water to enter a storm drain. Clean floor mats, filters, etc. inside building with discharge to a sanitary sewer (sink or floor drain). Cover, repair, or replace leaky dumpsters and compactors, and/or drain the pavement beneath them to the sewer. Rain can wash oil, grease, and substances into storm drains. Wash greasy equipment such as vents and vehicles in designated wash areas with an appropriate oil/water separator before storing outside. Ensure that designated wash areas are properly connected to the sewer system.

**Kitchen Grease – Kitchen Recyclable Oil, Grease and Meat Fat:** Safe oil, grease and meat fat for recycling in tallow bin or other sealed containers. Never pour into sink, floor drain or storm drain. Do not contaminate recyclable fats with waste grease from an oil/water interceptor or grease trap.  
  
See “Grease” and/or “Tallow” in the yellow pages for a recycling/hauling company.

**Kitchen Waste Grease from Interceptor or Trap:** Never dispose of waste grease in the storm drain or storm channel, or into the sanitary sewer system. For waste grease disposal, see “Grease Traps” or “Septic” in the yellow pages.

**Trash Disposal:** Trash includes all items that are discarded from a business with no intent for re-use. When trash is not properly placed in a trash bag and securely closed, before going to the outside trash can, dumpster, waste disposal truck or landfill it is vulnerable to transport by wind to the land surface where stormwater can transport it to waterbodies.

**Dumpster Use:** Dumpsters should always have the lids closed, as trash easily and frequently blows away from uncovered dumpsters and into the environment. Rainfall that interacts with trash can also leach and transport hazardous materials and other potential pollutants from the trash to surface waters.

**Toxic Waste Disposal:** Toxic waste includes used cleaners, rags (soaked with solvents, floor cleaners and detergents) and automotive products (such as anti-freeze, brake fluid, radiator flush and used batteries). Contact ADEQ for information about proper disposal.

**Kitchen Waste Disposal:** Purchase recycled products. By doing so, you help ensure a use for recyclable materials. Recycle the following materials:

* food waste (non-greasy, non-animal food waste can be composted);
* paper and cardboard;
* glass, aluminum and tin containers;
* pallets and drums; and
* oil and grease.

Keep recyclable waste in separate containers according to the type of material. They are easier to recycle if separated. Serve food on ceramic dishware rather than paper, plastic or Styrofoam and use cloth napkins rather than paper ones. If one must use disposable products, use paper instead of Styrofoam. Buy the least toxic products available. Look for “nontoxic, “non-petroleum based,” “free of ammonia, phosphates, dye or perfume,” or “readily biodegradable” on the label. Avoid chlorinated compounds, petroleum distillates, phenols and formaldehyde. Use water-based products and look for and use “recycled” and “recyclable” containers.

**Washing Grocery Carts – With Soap:** Wash water must be captured, filtered for particulates and pumped or drained to the sanitary sewer.

**Wash Down of Lunch Wagons/Food Carts:** Wash water must be discharged at a commissary equipped to accept and discharge wastewater to the sanitary sewer system. Never discharge any wash water (except melted ice) to gutters or storm drains. Trucks and carts and any equipment should be cleaned on a properly equipped wash pad.

**Washing Grocery Carts – Without Soap:** Wash water must be captured, filtered for particulates and pumped or drained to the sanitary sewer. If hot water is used, hot/warm water discharge to a storm drain or channel is prohibited.  
  
Wash water may be discharged to the storm drain through a filter barrier (e.g., booms) to filter out debris.

**BMPs for Boarding Stables, Equestrian Centers, Small Farms, Urban Horse Owners, and Kennels.**

Animal waste contributes to water pollution when it is improperly stored or left uncovered near small streams and storm drains. During rainfall, it is washed into storm drains and flows untreated, directly into surface waters.  
  
Animal waste contains some nutrients – phosphorus and nitrogen – as well as bacteria. The nutrients fertilize the aquatic plants causing their proliferation which depletes oxygen in the water, killing water life. The high bacteria levels in the water can cause gastrointestinal disorders and other medical problems.  
  
Sediment is also a common pollutant washed from pastures and hobby farms. It creates multiple problems once it enters surface waters. It harms water life by clogging the gills of fish, blocking light transmission and increasing water temperature.

**Corral Location and Facilities Design:** Site barns, corrals and other high-use areas on the portion of property that drains away from the nearest street or storm channel. Install gutters that will divert runoff away from livestock area.  
  
Design diversion terraces which drain into areas with sufficient vegetation to filter the flow. Protect manure storage facilities from rainfall and surface runoff.

**Pasture Management:** Confine horses in properly fenced areas except for exercise and grazing time. Corrals, stables, and barns should be located on higher ground when possible and surrounded by pasture to act as a natural filtration system.  
  
Utilize fencing to keep horses away from environmentally sensitive areas and protect stream banks from contamination. Use manure and soiled bedding sparingly to fertilize pastures and croplands.

**Grazing Management:** Establish healthy and vigorous pastures with at least 3 inches of leafy material present. Subdivide grazing areas into three or more units of equal size. Clip tall weeds and old grass to control weeds and stimulate grass growth. Rotate animals to clean pasture when grass is grazed down to 3 to 4 inches. Let pasture re-grow to 8 to 10 inches before allowing re-grazing. Keep animals away from wet fields when possible. During heavy rainfall, consider indoor feeding, or constructing protective heavy-use areas, which keeps more manure under a roof and away from runoff.

**Manure Collection and Storage:** Collect soiled bedding and manure on a daily basis from stalls and paddocks and place in temporary or long-term storage units. Store in sturdy, insect resistant and seepage free units such as:

* plastic garbage cans with lids;
* fly-tight wooden or concrete storage sheds;
* composters; and
* pits or trenches lined with an impermeable layer.

**Manure Use and Disposal:** Compost soiled bedding and manure for your own use. Give away composted material to local greenhouses, nurseries and botanical parks. Transport manure to topsoil companies or composting centers. Fertilize pastures, cropland, and lawns with manure and soiled bedding. Pasture fertilization should be in accordance with a nutrient management plan if application site is in a nutrient surplus zone.

**Pesticide Alternatives:** Integrated Pest Management is a more common sense approach for a long-term solution. Plan your "IPM" strategy in this order:

* pheromone traps;
* tarps;
* bug zappers;
* fly-tight storage sheds; and
* chemical controls;

Use these least-toxic products:

* pyrethrin-based insecticides;
* dehydrating dusts (e.g., silica gel);
* insecticidal soaps;
* horticultural oils; and
* landscaping, gardening and pest control.

**BMPs for Commercial Fertilizer and Pesticide Application for Lawn Services, Commercial Landscapers, Golf Courses, Local Governments and Others.**

Soil test before fertilizing to prevent over application.

Calibrate application equipment prior to application to prevent over application.

Prevent overspray of fertilizers and pesticides onto sidewalks and streets. If overspray occurs, vacuum oversprayed fertilizers and pesticides to prevent runoff into the storm drain during storm events. Do not apply fertilizer just before or during rainstorms.  
  
Rinse empty pesticide containers and treat the rinse water as you would the product. Dispose of empty containers in the trash. Dumping toxics into the street, gutter or storm drain is illegal! Non-recyclable materials must be taken to an appropriate landfill or disposed of as hazardous waste.

Do not apply fertilizers or pesticides in streamside buffers of waterbodies.

Follow USDA guidelines and label requirements when applying, storing and disposing of fertilizers and pesticides.

**BMPs for Residential Homeowners, Small Businesses and Landscapers, Taking Care of Lawns, Golf Courses, Etc.**  
Landscaping and garden maintenance activities can be major contributors to pollution and stream bank erosion. Soils, yard wastes, over watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering surface waters. Poorly functioning sprinklers and over watering, for example, waste water and increase the number of pollutants flowing into storm drains.  
  
Fertilizers, pesticides and herbicides are washed off lawns and landscaped areas. These chemicals not only kill garden invaders, they also harm useful insects and contaminate ground and surface water. Leaves, grass clippings and tree trimmings that are swept or blown into the street and gutter are also Las Vegas Wash polluters. These wastes clog catch basins, increasing the risk of flooding on your street, and carry garden chemicals into surface waters. As they decompose, they also absorb oxygen aquatic life need to survive.

Clearing or removing stream bank vegetation is a contributor to stream bank erosion problems in the State of Arkansas.

**Garden Location and Site Design:** Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting. Schedule grading and excavation projects for dry weather. Prevent erosion by planting fast-growing annual and perennial grasses. These will shield and bind the soil.

**Garden and Lawn Maintenance:** In communities with curbside yard waste recycling, place clippings and pruning waste in approved containers for pickup, or take clippings to a landfill that composts yard waste.  
  
Do not blow or rake leaves into the street, gutter or storm drains. Use organic or non-toxic fertilizers. Do not over-fertilize and do not fertilize near streets, storm drains or other waterbodies. Store pesticides, fertilizers, and other chemicals in covered areas to prevent runoff. Seed over bare spots in the landscape to prevent soil erosion.

**Pesticide Use:** The “chemicals-only” approach to pest control is only a temporary fix. A more common-sense approach is needed for a long-term solution: Integrated Pest Management. Plan your “IPM” strategy in this order:

1. **Physical Controls**

* caulking holes or hand-picking; and
* barriers or traps

1. **Biological Controls**

* predatory insects (e.g. Green lacewings eat aphids); and
* bacterial insecticides (e.g. Bacillus thuringiensis kills caterpillars)

1. **Chemical Controls – Your Last Resort**

Use these least-toxic products:

* dehydrating dusts (e.g. silica gel);
* insecticidal soaps;
* boric acid powder;
* horticultural oils; and
* pyrethrin-based insecticide.

**Safe Substitutes for Pest Control**

**Garden Aphids and Mites:** Mix one tablespoon of liquid soap and one cup of vegetable oil. Add one teaspoon of this mixture to a cup of water and spray. (Oil may harm vegetable plants in the cabbage family.)  
  
**Caterpillars:** When caterpillars are eating, apply products containing Bacillus thuringiensis to leaves.  
  
**Ants:** Place boric acid powder or hydramethylnon baits in problem areas, cracks and insect walkways. It is a mild poison, so be sure it is inaccessible to children and pets.  
  
**Roaches:** Apply boric acid powder to cracks and entry points (see ants above). Place bay leaves on pantry shelves.

If a pesticide must be applied, use one that is specifically designed to control your pest. The insect should be listed on the label. Approximately 90 percent of the insects on your lawn and garden are not harmful. Use pesticides only as directed. In their zeal to control the problem, many gardeners use pesticides at over 20 times the rate that farmers do.

**Pesticide Disposal:** Household toxics such as pesticides, cleansers and motor oil can pollute surface and groundwater(s) if disposed of in storm drains or gutters. Rinse empty pesticide containers and use rinse water as you would the product. Dispose of empty rinsed containers in the trash. To dispose of household hazardous waste, contact local officials or the University, of Arkansas Division of Agriculture Cooperative Extension Service for instructions.

**BMPs for Residential Home Owners.**

Household hazardous waste is defined as common everyday products that people use in and around their homes including paint, paint thinner, herbicides, and pesticides that, due to their chemical nature, can be hazardous if not properly disposed.  
  
As a rule, persons who generate household hazardous wastes should not pour them down the sink or put them in the regular trash unless they are certain that the wastes are non-hazardous to humans or the environment. In general, only non-hazardous solids should be disposed of in the regular trash.

The best way to deal with household hazardous wastes is not to have any! Before you buy a product make sure it will do the job you intend it to do. When possible, buy only the amount needed so there are no “leftovers” to store or to dispose of. Read the label before purchasing a product. Many times two products will do the same job, but one requires special disposal and the other does not. For example, latex paint versus solvent-based paint. Latex paint is water-based and is not classified as hazardous, while solvent-based paints are considered a hazardous material.

In addition, other hazardous materials, such as turpentine or mineral spirits, are required for clean up when using a solvent-based paint. Soap and water are all that are needed to clean up after using latex paint. The clear choice from an environmental perspective is latex paint. When possible, avoid purchasing products with POISON, DANGER, WARNING, FLAMMABLE, TOXIC, CORROSIVE or CAUTION on the label.  
  
If potentially hazardous products must be purchased, read and follow the label directions. Store these items in their original container and never remove the label. Keep all hazardous products stored in a location away from children, and out of their reach.

**Disposal Options:** Many products offer toll-free numbers that can provide information on properly disposing of their product, or the label itself may provide instructions on proper disposal. Share unused material. Give it away to friends, relatives or neighbors who can use it. Never share materials that are not in their original container or that have been tampered with in any way.

**Household Hazardous Waste Collection Events:** Take hazardous materials to a household hazardous waste collection event. Contact local officials or the University of Arkansas Division of Agriculture Cooperative Extension Service to find out when a household hazardous waste event will be scheduled for your community. Material should be tightly sealed in its original container, if possible, and placed in a cardboard box. Glass containers should be wrapped in towels, cloth or packaged in some other way to prevent breakage. Materials should be transported to the event in the trunk or bed of your vehicle.

Items generally accepted include:

* photo chemicals;
* automotive fluids;
* household cleaners;
* pool acids/chlorine;
* solvents and thinners;
* paints/stains/varnishes; and
* household and car batteries.

Items generally not accepted include:

* ammunition;
* medical waste;
* explosive material; and
* radioactive material.

**BMPs for Residential Home Owners, Pool Owners, and Carpet Cleaners.**

The wastewater generated from of cleaning homes, drive ways, patios and decks can harm the environment if they enter the storm drain system. Washing the exterior of homes or paved surfaces into a gutter or storm drain pollutes the environment. Water runoff from these activities can pick up sediment, debris and oil. These pollutants drain into surface waters, harming aquatic life. Oil and grease, for example, clog fish gills and block oxygen from entering the water. If oxygen levels in the water become too low, aquatic animals die. And, toxins found in degreasers and cleaners can, in high concentrations, harm aquatic life.

**Washing Mobile Homes, Decks, Roofs/Shingles, Awnings, Pool Decks, and Patios:** Discharge wash water to landscaped or soiled area. Be aware that soapy water may adversely affect landscaping. Discharge should be directed to an area large enough to contain all the water. Discuss this practice with the property owner.  
  
If wash water doesn't go to soil/landscaping or if soap is used, wash water must go to the sanitary sewer. If no soap is used, wash water may be discharged to the gutter or storm drain through a filtering apparatus (e.g., boom to capture debris and particles.)  
  
Treated wood shingles are often treated with a toxic material. Treated shingles should be dry swept only. Runoff from cleaning may be toxic to plants in a landscaped area and should never be discharged to the storm drain or sanitary sewer.

**Pool Draining:** Pool water must be discharged to the sanitary sewer via an onsite sewer manhole or through a resident's sewer clean-out. Pool draining into the street or storm drain is against city and county ordinances. Contact local officials for requirements and additional information.

**Carpet Cleaning:** Wastewater from carpet cleaning must be discharged to the sanitary sewer via an onsite sewer manhole or through a resident's sewer clean-out. Wastewater draining into the street or storm drain is against city and county ordinance. Contact local officials for requirements and additional information.

**Lawn Watering:** Discharging irrigation water to the storm drain system should be avoided. Over watering can transport pollutants like pet waste, fertilizers, and pesticides into the streets and eventually into the stormwater system. Help protect stormwater by following these simple lawn and household water guidelines.

* + When washing your car, use biodegradable soap with as little water as possible.
  + Shut off the hose while washing your car and then rinse.
  + Adding or removing one minute from the watering time will change the amount of water you use by 25 percent.
  + Don't water when it's windy or rainy.
  + Schedule start times at least one hour apart. Use the cycle and soak method of watering.
  + If the timer has a “skip day” mode, water lawns four to five days apart in the winter and two to three days apart in the spring and fall.

**References Cited**

Environmental Protection Agency: Washington D.C. Managing Urban Runoff, 2009. <http://water.epa.gov/polwaste/nps/outreach/point7.cfm>.

Arkansas Department of Environmental Quality: North Little Rock, 1995 Water Quality, Macroinvertebrate and Fish Community Survey of the Upper White River Watershed, Northwest Arkansas, West Fork, Middle Fork and Main Fork White River, Brush Creek, Richland Creek, War Eagle Creek, Kings River, Osage Creek. Long Creek and Yocum Creek.

Arkansas Department of Environmental Quality: North Little Rock. 2008 List of Impaired Waterbodies (303(d) List). http://www.adeq.state.ar.us/water/branch\_planning/pdfs/303d\_list\_2008.pdf.

Arkansas Department of Environmental Quality: North Little Rock. 2006 List of Impaired Waterbodies (303(d) List). <http://www.adeq.state.ar.us/water/branch_planning/pdfs/303d_list_2006.pdf>.

Clark County Stormwater Quality Management Committee, 2005. Best Management Practices. Stormwater Quality Management Committee: <http://www.lvstormwater.com/bmps.html>.

Cogger, C.G., 1995. Clean Water for Washington, Septic System Treatment in Soil. Washington State University Cooperative Extension Service: Puyallup, WA.

Environmental Protection Agency: Washington, D.C. 2004 National Water Quality Inventory: Report to Congress. <http://water.epa.gov/lawsregs/guidance/cwa/305b/upload/2009_01_22_305b_2004report_2004_305Breport.pdf>.

Formica, S.J., M.A. Van Epps, M.A. Nelson, A.S. Cotter, T.L. Morris, J.M. Beck, 2004. West Fork White River Watershed-Sediment Source Inventory and Evaluation.” Self-Sustaining Solutions for Streams, Wetlands and Watersheds Proceedings of the September 2004 conference ASAE. St. Joseph, MI. pp 125-132.

Novais, R., and E. J. Kamprath, 1978. “Phosphorus Supplying Capacities of Previously Heavily Fertilized Soils.” Soil Science Society of America Journal, 42:931-935.

NRDC, 2001. “How to Clean Up Our Water: Twelve Simple Ways You Can Help Stem the Tide of Polluted Runoff.” Natural Resources Defense Council: http://www.nrdc.org/water/pollution/gsteps.asp.

# Arkansas Department of Environmental Quality: North Little Rock. Authorization to Discharge Stormwater Under the National Pollutant Discharge Elimination System and the Arkansas Water and Air Pollution Control Act. http://www.adeq.state.ar.us/water/branch\_permits/general\_permits/stormwater/construction/pdfs/ARR150000\_permit.pdf.