

Economic and Environmental Issues in Arkansas: A Policy Perspective

An Assessment of Storm Water Runoff Issues in Pine Bluff, White Hall, the University of Arkansas at Pine Bluff and Jefferson County

Executive Summary

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Introduction

Small municipalities and urbanized areas are required to implement programs and practices that control polluted storm water runoff under the U.S. Environmental Protection Agency (EPA) Storm Water Phase II Final Rule. Pine Bluff, White Hall, the University of Arkansas – Pine Bluff and Jefferson County are included in the areas regulated by the Storm Water Phase II Final Rule. The University of Arkansas Extension Service is currently assisting Pine Bluff, White Hall, the University of Arkansas-Pine Bluff (UAPB) and Jefferson County with sections of their Phase II requirements. In order to gauge the level of local awareness regarding storm water runoff, the UAPB Regulatory Science Center in conjunction with the University of Arkansas Extension Service conducted a mail survey of the Pine Bluff, White Hall and Jefferson County area. The results of the survey will be used to assist the Jefferson County Extension Service and local municipalities with their storm water runoff public education programs.

The overall goal of the survey was to assess the public's level of knowledge regarding urban storm water runoff issues in the Pine Bluff, White Hall and Jefferson County area. Regulated municipalities and urban areas covered under the Phase II Rule will be required to fully implement their storm water management programs by the end of the first permit term (typically a 5-year period) (EPA 2000).

Methodology

The University of Arkansas – Pine Bluff Regulatory Science Center worked closely with University of Arkansas Extension personnel to develop an urban storm water runoff survey instrument targeting the Pine Bluff, White Hall and Jefferson County communities. This collaboration provided quality and neutrality within the survey.

The population sizes of the local communities were determined by using the population finder from the U. S. Census Bureau quick facts website (www.factfinder.census.gov). Sub-sample sizes of the local communities were determined using the Dillman technique (Dillman, 2000).

Marketing Systems Group was employed to generate randomized name and address lists for each local community group based on their calculated sub-sample size and randomly selected addresses in each target community by zip code. Each individual name and address was assigned a number which was used to keep track of the surveys.

Survey packages containing a cover letter and a numbered survey were mailed January 23-24, 2007. The survey consisted of 43 questions designed to gauge the community's knowledge of storm water runoff issues, household activities that may affect local surface water quality, and the current state of surface water quality in the area. Open-ended, closed-ended, numerical and ordinal questioning styles were used. Varied question styles were used to help us to identify storm water runoff and water quality issues of concern to local communities. The first reminder cards were mailed on February 23, 2007, one month after the surveys were mailed. The second and final reminder cards were mailed March 23, 2007. Logs were kept to track when surveys were received. Surveys received after April 23, 2007, were not included in the analysis. Completed survey responses were entered into Survey Pro (Version 2.0) and descriptive statistics were generated.

Key Findings

A total of 1116 surveys were mailed: 381 to Pine Bluff, 357 to White Hall, and 378 to Jefferson County households. An overall total of 297 surveys were completed and returned with 52 surveys returned by the postal service due to no forwarding address, insufficient address, no mail receptacle or an expired forwarding order. The overall response rate for this survey was 27%, with no incentive for survey participation offered. Within the first two weeks, a total of 254 (23%) completed surveys were received. The response rate progressively decreased during consecutive weeks.

After the first reminder cards were mailed, we received a total of 17 (2%) completed surveys. After the final reminder cards were mailed, a total of 9 (0.8%) completed surveys were received. Forty-seven percent of the respondents were from Pine Bluff and 32% were from White Hall. The remaining respondents reside in Jefferson County and surrounding areas (21%).

Less than 0.5% of the respondents were younger than 25 years old, while the majority (45%) was 55 to 74. Almost half of the respondents (46%), regardless of age indicated runoff water from their lawns was absorbed into the ground or a combination of ground absorption and storm drains (37%).

However, the majority of respondents were neutral regarding the impact of rain water run off from their lawns and gardens (40%), hosing debris from driveways (39%), and soil erosion from home and garden construction projects (38%). Respondents agreed to a lesser extent that the above mentioned items had an impact on local water quality (33%, 29% and 30%). When asked about local surface water quality, 34% responded that they were not sure about the quality, 31% responded that the quality was about the same as five years prior, 28% responded that surface water was more polluted than five years prior. Only 7% responded that there was less pollution than five years prior in local surface water. The majority of respondents indicated that specific surface waters such as Bayou Bartholomew and Lake Pine Bluff had fair to poor water quality. Respondents with less education rated Bayou Bartholomew and Lake Pine Bluff water quality lower than respondents with higher levels of education.

Over 90% of respondents used pesticides on their lawn, indoors or in their gardens with 77% personally applying the pesticides. Of those who personally applied the pesticides, 96% stated they followed the recommended application rates. Over half (53%) responded it was very important to keep their yards free of bugs.

Over 70% stated it was either very important or somewhat important to keep their yards free of weeds. Most respondents, regardless of age, stated that they controlled weeds by pulling them by hand (38%), 36% responded that they only treated problem areas, and 22% applied herbicides. Respondents with some college, vocational training and graduate/professional degrees, were more likely to use a professional service to treat their lawns than those with less education. Over half of the households surveyed (58%) fertilized their lawns twice a year or more and the majority followed the application directions (96%). However, the grass

clippings from almost two-thirds of household lawns were never or only sometimes collected. Almost half (44%) of respondents had at least one or more dogs, and 68% of them disposed of dog waste in the yard. Of respondents who walked their dogs, 23% left their pet's waste on the street or ground.

Fifty seven percent of households surveyed washed their cars at home at least once a month, with 80% of the cars being washed in their driveways. Conversely, 89% of respondents stated they did not work on their cars at their residence—which included changing the car's oil and antifreeze. Most (87%) stated they did not change their oil, and 90% did not change their antifreeze. Of those that changed their oil and antifreeze at their residence, 1% and 2% respectively, dumped these toxic substances on the ground or street.

Conclusion

Our surface waters are the final destination for storm water runoff. Bayou Bartholomew and Lake Pine Bluff are examples of where our storm waters travel. Storm water runoff in Pine Bluff, White Hall, UAPB and Jefferson County is not treated before it is discharged to our surface waters and may contain pollutants such as oil and grease, harmful bacteria, toxic chemicals and excess nutrients all of which are harmful to people and aquatic environments. Chemicals such as herbicides and pesticides are particularly harmful to aquatic life and aquatic environments. All chemicals and fertilizers should be used according to their intended purpose and always according to label directions. Chemicals and fertilizers should not be applied immediately before heavy rains. Pet waste contains bacteria, viruses and excess nutrients that can contaminate surface and ground water. Pet owners should dispose of their pet's waste in a garbage can or toilet.

Washing cars at home often uses more water than a commercial car wash and can release oil and grease into runoff water. Commercial car washes filter, clean and recycle wastewater in many cases and are required to dispose of wastewater at a treatment facility. If washing your car at home can not be avoided, wash less, use a biodegradable, environmentally-friendly soap and wash it on the lawn so that waste water can soak into the ground.

Hosing debris from driveways and soil erosion from home and garden construction projects may not seem like big issues when only one person does them. The real problem is the cumulative effect of a large community exhibiting this same behavior collectively. The cumulative amount of sediment and debris damages our surface water quality and aquatic habitats. This behavior causes problems for others down stream away from our communities as well as aquatic and terrestrial habitats. Additional storm water runoff education is needed to address the above-mentioned actions of citizens in the Pine Bluff, White Hall, University of Arkansas-Pine Bluff and Jefferson County communities.