State of Arkansas

Arkansas Department of Environmental Quality

Water Division

2008 Integrated Water Quality Monitoring and Assessment Report

Prepared pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act

"To Protect, Enhance and Restore

the Natural Environment

for the Well-being of all Arkansans."

This book is maintained by:
Arkansas Department of Environmental Quality
Water Division

Prepared pursuant to Sections 305(b) and 303(d)
of the
Federal Water Pollution Control Act

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STATE OF ARKANSAS

DEPARTMENT
OF
ENVIRONMENTAL QUALITY

INTEGRATED WATER QUALITY MONITORING
AND ASSESSMENT REPORT
2008

Prepared pursuant to Sections 305(b) and 303(d)
of the
Federal Water Pollution Control Act

WQ08-04-01

350 Pages

Water Division Planning Branch

Mr. Steve Drown is currently the Chief and Mr. Mo Shafii is the Assistant Chief of the Water Division. Both are actively involved with many of the activities of the Water Quality Planning Branch (Branch). The Branch consists of biologists/ecologists and geologists and is responsible for a variety of issues related to surface and ground waters. Among them is the management of the State Water Quality Monitoring Networks for both surface and subsurface waters. Included in the network is routine monitoring as well as intensive, special investigations of watersheds and/or aquifers. The data generated from these activities are used to prepare the biennial "Integrated Water Quality Monitoring and Assessment Report (305(b))" and the "List of Impaired Waterbodies, (303(d) list)", and to develop Total Maximum Daily Loads (TMDLs) for impaired water bodies. The data are also used to develop water quality standards and criteria for designated use assessment.

The staff continues to develop and/or enhance ecoregion-based, biological assessment criteria for both fish and macroinvertebrates. The staff is active in the development and updating of water quality standards and technical review and administration of the National Pollutant Discharge Elimination System Permits Whole Effluent Toxicity Testing Program. Ground water issues of concern in recent years have included the investigation of pesticides in ground water, potential impacts from confined animal operations, saltwater intrusion in southeastern Arkansas, and most recently the development of ground water standards. Various staff members represent the Department on numerous federal, state, local, and watershed-based advisory boards and technical support groups.

Current staff includes:
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Mo Shafii, Assistant Chief, Water Division

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To learn more about the Water Division and other divisions of the Arkansas Department of Environmental Quality, and to view a list of publications by the Planning Branch of the Water Division, visit http://www.adeq.state.ar.us/water or call at (501) 682-0660.

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PART I EXECUTIVE SUMMARY/OVERVIEW

Section 305(b) of the Clean Water Act requires the States to perform a comprehensive assessment of the quality of waters of the State, with a report due to Congress every two years. Section 303(d) of the Act also requires the States to prepare a list of impaired waters on which TMDLs (total maximum daily loads) or other corrective actions must be implemented. Current USEPA guidance recommends the States produce an integrated report combining the requirements of the Act for Sections 305(b) reporting and 303(d) submissions. The combined report is referred to as the *Integrated Water Quality Monitoring and Assessment Report.* This report was prepared using the "Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act; TMDL-01-03" and its supplements. The reporting period for Arkansas's 2008 report is from July 1, 2002 to June 30, 2007.

The use of River Reach File 3 (RF3) by the USEPA to tabulate and classify waterbodies significantly increases the tabulation of the total waters within the State. All waters or water courses that are apparent on the USGS 7.5 minute quadrangle maps were digitized by digital line graph traces and tabulated by different types of waterbodies (e.g., perennial streams, intermittent streams, ditches, etc.). The number of stream miles tabulated for Arkansas increased from approximately 11,900 miles (RF1) to almost 88,000 miles (RF3). However, since the RF3 database includes many waters with only ephemeral flows and very short-term uses, the RF1 data was retained as the base delineation and tabulation of Arkansas's waters. More recently, this database has been supplemented with data from the Hydrography Dataset.

Specific guidance was developed by USEPA for all States to aid in making use determinations. This guidance is intended to provide national consistency in the assessment process rather than allowing a State to establish its own assessment criteria. However, it is always necessary to modify the criteria based on the type and amount of data available, and to best represent the many different ecoregions and waterbody types across the state.

The water quality databases from which to draw have improved in area coverage as well as parameters sampled. Additionally, the length of time which these databases have existed is now allowing valuable trend determinations, although these are not a required part of the report. The primary database used for this assessment is the Arkansas Department of Environmental Quality's ambient and roving water quality monitoring database. However, water quality and biological data collected by Department staff, other state and federal agencies, watershed groups, private consultants, and universities were also evaluated.

Numerous toxicity tests have been completed and reviewed during this reporting period including self-monitoring tests by the dischargers and compliance testing by the Department. The bacteria monitoring program was continued at selected monitoring stations which were sampled seasonally for *Escheri coli* (*E. coli)* bacteria as per USEPA guidance.

The assessments in this report have been based on the rather extensive database as described above and by the assessment methodology as described in Part III, Chapter 3.

The following is a summary of the assessment of Arkansas's waters:

Total miles of streams in RF1	11,900.0
Total miles of streams in RF3	87,617.4
Miles assessed for use attainment	9,849.7
miles monitored	6885.5
miles evaluated	2964.2
Miles meeting all assessed uses	5763.2
Assessed miles not meeting fishable goal	363.3
Assessed miles not meeting swimmable goal	564.8

This data indicates that 63 percent of the assessed waters are meeting all of the assessed designated uses. This is a conservative estimate and this percentage cannot be extrapolated to all waters of the State for the following reasons: a) if any of the designated uses of a waterbody are not met, the waterbody is listed as "not meeting uses" even though all of its other uses are adequately met; b) a large number of the water quality monitoring stations are purposely located in areas known or suspected of having water quality contamination. This results in a higher percentage of problem areas being monitored, thereby skewing the results toward the use impaired category; c) much of the data from the Delta Region of the State was listed as unassessed due to the difficulty of determining water quality impacts where severe physical alteration of the habitat has occurred; and d) although fish consumption is not a statutory or a water quality standard designated use, USEPA guidelines require this evaluation. Waters with restricted fish consumption advisories are assessed as impaired and therefore, do not meet all designated uses. Previously, overall use support was based on the full support of all designated uses; if one of those uses was not assessed, it was not counted as supporting all uses. New guidance requires tabulation of waters supporting all *assessed* uses; therefore, if one or more uses were not assessed, but all assessed uses were fully supported, the water is counted as "supporting all assessed uses."

Among the Department's numerous water quality management programs, Section 401 (water quality certification) is utilized to review all federal licenses or permits, including, but not limited to Section 404, which may result in any discharge of dredged or fill materials into the navigable waters. Such certification is determined on the basis of protection of designated uses and the antidegradation requirement of the State's water quality standards.

Ground water assessment activities by the Department have expanded significantly in the last 12 years. The Arkansas Ambient Ground Water Quality Monitoring Program currently maintains over 200 monitoring sites across the State, which have been sampled approximately every three years on a rotating basis since inception of the program. The monitoring network has been expanded from nine to eleven distinct areas. The Department added an ambient ground water monitoring area along the boundary of the Athens Piedmont Plateau and the Gulf Coastal Plain in Pike and Howard counties to determine the possible deleterious impact on ground water quality from the extensive swine, broiler and cattle operations of this region, and to expand the knowledge of baseline ground water chemistry of the numerous aquifers within this area. Wells in this area are completed in the Mississippian and Devonian Arkansas Novaculite, the Pennsylvanian Jackfork Sandstone, the Cretaceous Tokio Formation, and Quaternary deposits of the alluvial aquifer. Additionally, the Department has developed a ground water monitoring area in Pulaski and Saline Counties in the northeastern Ouachita Mountains region of central Arkansas to characterize ground water quality in the numerous Paleozoic formations of this region, and to identify possible anthropogenic impacts on ground water quality from accelerated commercial and residential development in this area. In addition to the established ambient monitoring sites, the Department has initiated several special ground water investigations in order to evaluate areas of the state with particular concerns. These investigations include analyzing the effects of pesticide use in the Delta, impact of confined animal operations in northwest Arkansas, areas of saltwater intrusion in southeast Arkansas, occurrence of arsenic exceeding federal MCLs in eastern Arkansas, and the interaction of surface and ground water in the Arkansas River alluvium near Dardanelle, Arkansas.

The increasing focus on ground water quality in recent years directly reflects the increased attention given to nonpoint sources of contamination. Toward that end, other state and federal agencies are involved in ground water case studies on an unprecedented level, including agencies which in past years had little involvement in ground water quality concerns, such as the University of Arkansas (U of A) Cooperative Extension Service and the Natural Resources Conservation Service, among others. In addition to water quality concerns, declining ground water levels prompted the Arkansas Natural Resources Commission to enact legislation in 1991 to address the overuse of ground water. The present report on ground water assessment activities generally follows the 1996 USEPA guidance, which enacted many changes intended to provide consistency among states' reports.

Ground water accounts for approximately 60 percent of the total water use in Arkansas, and provides high-quality water for industrial, agricultural, municipal and domestic uses, among other important facets, including contribution to baseflow in streams, recreational use of hot springs, and numerous other benefits. Both nonpoint and point sources of contamination have been documented throughout Arkansas, and monitoring and remediation of these sources, in addition to contamination prevention activities; continue to tax the resources of the Department's various ground water protection programs. As part of the 10-year Strategic Plan, ADEQ has committed to the development of state-promulgated ground water standards for protection of the State's ground water aquifers. Although several of ADEQ regulations include language that standardizes pollution prevention activities, investigation, and remediation of known contamination, the regulations are somewhat disjointed and mostly intended to deal with specific contaminants; thus they lack the comprehensiveness needed to adequately address the full spectrum of potential contaminant sources within the State. The Department is currently working through an internal task force, composed of members from various divisions, to address important components of statewide ground water standards development.

Arkansas's point source discharge controls are managed through the NPDES program which USEPA delegated to the State in 1986. This program is guided by the State's Water Quality Management Plan, the State's Surface Water Quality Standards, and the Continuing Planning Process. Enforcement activities are based on non-compliance as reported through the

NPDES permitting system, with monitoring data compiled through monthly discharge monitoring reports and compliance inspections of NPDES facilities.

The initial Nonpoint Source Pollution Assessment for Arkansas was prepared using pre-1988 data. An assessment update was completed in 1990 and again in 1997, which indicated agricultural activities as the major source of waterbody impairment. Data from the current water quality assessment indicates a similar trend, except that in stream turbidity is now associated with overall surface erosion, not solely from agriculture activities. The major efforts of nonpoint source management are oriented toward the waste management activities of the confined animal production areas and in controlling surface erosion. In February 2003 new federal regulations were implemented to help minimize impacts from dry litter operations. Increased intensity of ground water and surface water monitoring and applied research on the fate of animal waste applied to pastures are attempting to address the nonpoint source impacts from confined animal activities. Expansion of the nonpoint source management program began in 1998 and now includes management plans for resource extraction, silviculture, agriculture, surface erosion, household and small business. Storm water pollution prevention plans have been developed to reduce the impacts of construction activities in rapid growth areas in the larger metropolitan areas of the State. Because of recent assessments of impaired waters in the row-crop dominated Delta area of the State and the completion of TMDLs, implementation of watershed management plans are expanding into row-crop agriculture. Through the formations of watershed groups and education outreach programs, the implementation of watershed restoration activities has begun to address many of these issues.

The classification of the State’s waters by ecoregion not only categorizes them by physical, chemical, and biological features, but separates the major pollution problems, most of which are land use related. Water quality standards and assessment criteria are also developed using this classification scheme. However, this delineation, at times, is too broad to adequately differentiate the natural variances in water quality that occur from one area of a level three ecoregion to another. This leads to inappropriate standards and assessment criteria for certain waterbodies resulting in inaccurate designated use attainment evaluations. A general summary of the water quality by ecoregion follows.

Water quality in the Delta Region is significantly influenced by nonpoint source runoff from its highly agriculturalized areas. The vast majority of the waterways within this region form a network of extensively channelized drainage ditches. Government programs have been used to develop this highly productive agricultural land. In contrast, many of the practices utilized in making this land more productive actually impact the designated water quality uses. Most Department work within this region indicates that, in the majority of these waters, the best that can be expected in terms of a fishery is an altered fishery. Once a natural stream has been channelized, only those organisms which do not require in stream cover and can exist in highly turbid waters will survive. Within these systems the fishable goal of the CWA is being met, even though the aquatic life communities have been substantially altered.

The Gulf Coastal Region of southern Arkansas exhibits site specific impacts because of historical resource extraction activities; including the extraction of petroleum products, brine, bromine, barite, gypsum, bauxite, gravel, and others. Impacts occur from the extraction site, from storage and transmission of the product, and from the processing facilities. Although timber is the major resource harvested in this area, no large-scale impairments from these activities have been identified in this area.

The Ouachita Mountains Region has characteristically been described as a recreational region that possesses exceptionally high quality water. The predominant land use is silviculture, both in private timber companies and National Forest holdings. Some of the Ouachita Mountains have been plotted on a national scale map as areas potentially sensitive to acidification (acid rain). Data is currently inconclusive concerning any impact on the region due to acid precipitation. Additional concerns have been voiced by various groups and organizations dealing with potential erosion and siltation as a result of management practices used in timber harvest. Periodic water quality monitoring data has not indicated significant impacts to the streams within this region. Occasional above normal turbidity values have been observed during periods of significant rainfall events. Potential impacts to waters in this region include land clearing for pasture without protective riparian zones, in stream gravel removal, post resource extraction, and existing areas of confined animal production.

The Arkansas River Valley Region exhibits distinct seasonal characteristics of its surface waters with zero flows common during summer critical conditions. Peak runoff events from within this region tend to introduce contaminants from the predominantly agricultural land use, which are primarily pasturelands and increasing poultry production. Fecal coliform bacteria have been a parameter of concern due to its preclusion of the swimmable use. Measurements during storm events routinely exceeded the water quality standard, although the source usually was not fecal contamination. The use of *E. coli* as the indicator organism provided a more accurate measurement of contamination from warm-blooded animals and has indicated no significant problems. Exploitation of natural gas deposits has resulted in some site specific water quality degradation. This area experienced a rapid expansion of confined animal activities throughout the 1990s. Soil types in much of this area are highly erosive and tend to easily go into colloidal suspension, thus causing long-lasting, high turbidity values.

The Boston Mountains Region, located in north central Arkansas, is a sparsely populated area. The dominant land use is silviculture and much of the region is located within the Ozark National Forest. It is a high recreational use region with exceptionally high quality water. A large percentage of the streams from this region are designated as extraordinary resource waters. Major concerns about potential water quality degradation include: 1) conversion of hardwoods to improved pastures; 2) confined animal operations; 3) even-aged timber management; and 4) localized natural gas production. Current monitoring data from within this region continues to reflect high quality water. Periodic, elevated levels of turbidity are noted in some waters in this region. This is most likely caused by clearing of timberland adjacent to major streams for conversion to pastures, which accelerates stream channel and bank erosion. In addition, secondary and tertiary road construction/maintenance and in stream gravel removal are exacerbating the turbidity problems.

The Ozark Highlands Region, located in extreme north Arkansas, is noted for its mountainous terrain with steep gradients and fast-flowing, spring-fed streams. A large percentage of the streams from within this region are designated as extraordinary resource waters. The fractured limestone and dolomite lithology of the region allows a direct linkage from surface waters to ground waters. The water quality problems within this region are directly related to land use. The large human population increase in this area also results in increased water contamination from infrastructure development as well as surface erosion from construction activities. Within this region are some of the highest animal production rates in the State. Removal of gravel from the banks and beds of streams is a frequent activity. This causes direct habitat destruction and greatly accelerates siltation problems within the streams.

PART II BACKGROUND

CHAPTER ONE ATLAS OF ARKANSAS

There are approximately 34 million acres of land and water inside Arkansas's boundaries. Of this total, 15.1 million acres are in agriculture production, approximately 8.2 million acres in crop production, and 6.9 million acres in pastureland and other agricultural uses. There are approximately 17 million acres of forests in the State; however, not all of these acres are managed for timber production. The remaining 1.9 million acres are in state parks and wildlife areas, waterways, highways, roads, urban areas, and other non-agricultural lands. There are approximately one-half million acres of impounded surface waters in the State.

River Basins/Total River Miles

The State is divided by six major river basins: the Red River Basin, Ouachita River Basin, Arkansas River Basin, White River Basin, St. Francis River Basin, and the Mississippi River Basin. Arkansas has 12,071.7 miles of rivers and streams digitized in the USEPA River Reach File (RF1) with some additions by the Department. The RF1 files were digitized from 1:500,000 scale maps and include only the major water bodies. Recently the USEPA has re-digitized the State's water bodies from the 7.5-minute topographic maps, thus significantly increasing the detail and the number of water bodies. This includes the intermittent streams and ephemeral drainages that flow only during a rainfall event.

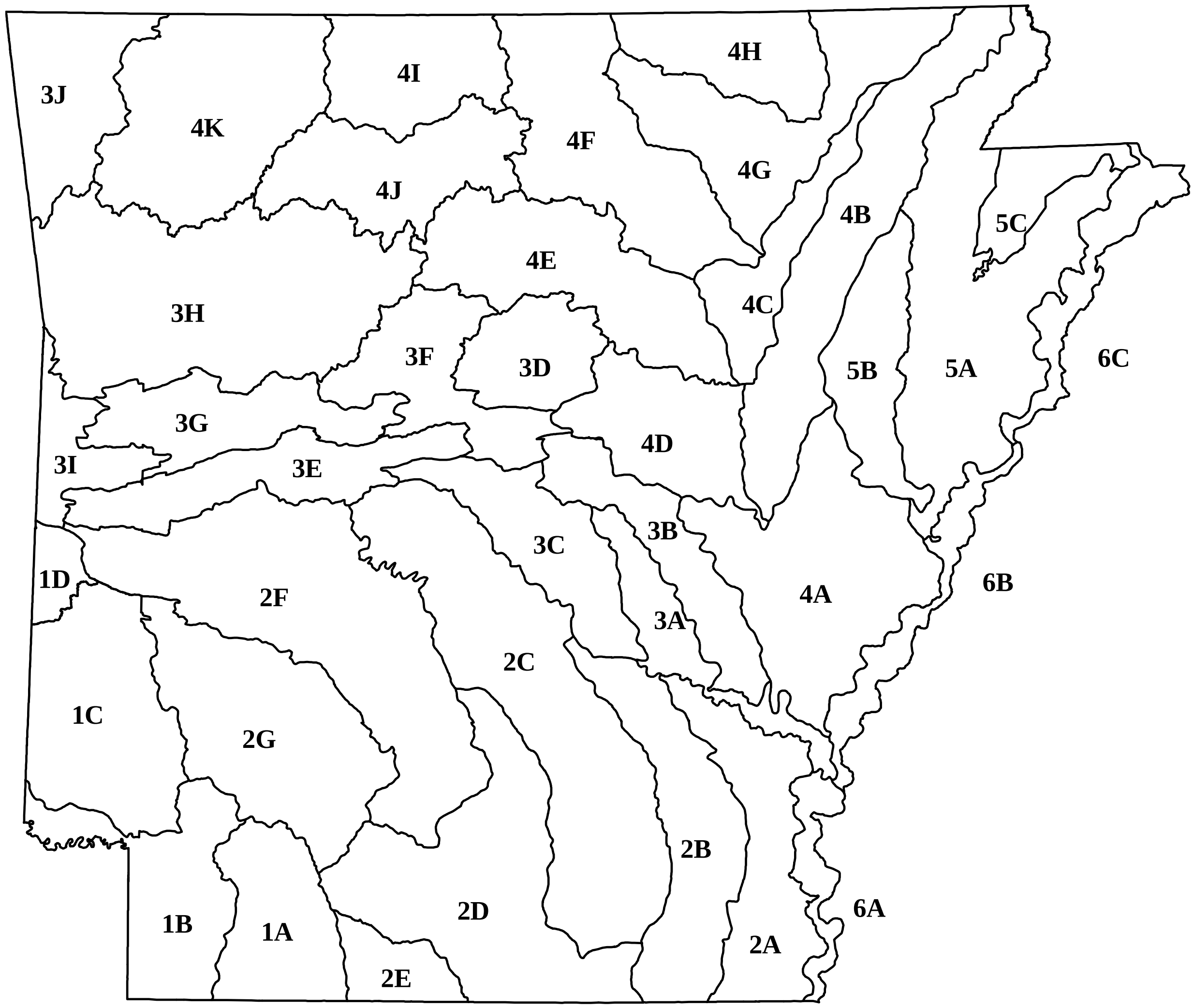
For comparison, the following data was developed from the USEPA RF3/DLG database for the State of Arkansas:

Total river and stream miles	87,617.5
Perennial stream miles	28,408.2
Intermittent stream miles	53,465.2
Ditches and canal miles	5,250.6
Border stream miles	493.5
Total acres of lakes, reservoirs, and ponds	515,635.0

Since most of the water bodies identified in the RF3 files are not assessed, the State has chosen to retain the RF1 database in its assessment process.

The 6 major river -basins are subdivided into 38 water quality planning segments (Figure II-1) based on hydrological characteristics, human activities, geographic characteristics, etc. The planning segments are further broken down into 492 smaller watersheds, based on discrete hydrological boundaries as defined by the U.S. Natural Resources Conservation Service.

Figure II-1: Water Quality Planning Segments



1 Red River Basin	4 White River Basin
2 Ouachita River Basin	5 St. Francis River Basin
3 Arkansas River Basin	6 Mississippi River Basin

Publicly Owned Lakes/Reservoirs

A discussion of lakes and reservoirs is included in Part III, Chapter Five and includes a list of Arkansas's publicly owned lakes and reservoirs and their trophic status. The State has a total of 357,896 acres of significant publicly-owned lakes. The USEPA RF3/DLG calculation identifies a total of 515,635 acres of lakes, ponds, and other impounded waters in the State, some of which are private fish production facilities and water treatment facilities.

Wetlands

The draft National Wetlands Priority Conservation Plan (NWPCP) identified Arkansas as one of nineteen states that experienced significant decreases in wetlands from 1954 to 1974. Most of the State's wetlands are located in the Delta which is dominated by row-crop agriculture, where the primary threat to wetlands is conversion to cropland. Although the conversion rate appears to have peaked in the 1960s and is now decreasing, the total wetland base has declined substantially making smaller losses more critical. Without significant changes in wetlands protection strategies, it was predicted that Arkansas's Delta Region would continue to lose wetlands at a rate of over 15,000 acres per year. Additional discussion about the State's wetlands is located in Part III, Chapter Six.

Summary of Classified Uses

Essentially, all waters of the State are classified for specific designated uses. Approximately 1,833 miles (about 16%) of Arkansas's streams are classified as high quality, outstanding state or national resources. The designated uses assigned to various water bodies include:

- Extraordinary Resource Waters (ERW)(Figure II-2)
- Ecologically Sensitive Waterbody
- Natural and Scenic Waterways
- Primary Contact Recreation ("swimmable")
- Secondary Contact Recreation
- Fisheries ("fishable")
    - Trout
    - Lake and Reservoir
    - Stream
        - Ozark Highlands
        - Boston Mountains
        - Arkansas River Valley
        - Ouachita Mountains
        - Typical Gulf Coastal
        - Spring water-influenced Gulf Coastal
        - Least-altered Delta
        - Channel-altered Delta
- Domestic Water Supply
- Industrial Water Supply
- Agricultural Water Supply

Figure 1-2: Arkansas's Extraordinary Resource Waters

1 Alum Fork Saline River
2 Archey Creek
3 Arkansas River
4 Beech Creek
5 Big Creek, Cleburne Co.
6 Big Creek, Fulton Co.
7 Big Fork Creek
8 Buffalo River
9 Bull Shoals Reservoir
10 Cache River
11 Caddo River
12 Cadron Creek
13 Caney Creek
14 Cossatot River
15 Current River
16 DeGray Reservior
17 Devils Fork Little Red River
18 East Fork Cadron Creek
19 East Fork Illinois
20 Eleven Point River
21 English Creek
22 Falling Water Creek
23 Field Creek
24 Gut Creek
25 Hurricane Creek
26 Illinois Bayou
27 Kings River
28 Lake Ouachita
29 Lee Creek
30 Lick Creek
31 Little Missouri River
32 Middle Fork Illinois
33 Middle Fork Little Red River
34 Middle Fork Saline River
35 Moro Creek
36 Mountain Fork River
37 Mulberry River
38 Myatt Creek
39 North Fork Cadron Creek
40 North Fork Illinois
41 North Fork Saline River
42 North Sylamore Creek
43 Piney Creek
44 Racoon Creek
45 Richland Creek
46 Salado Creek
47 Saline River
48 Second Creek
49 South Fork Caddo River
50 South Fork Saline River
51 South Fork Spring River
52 Spring River
53 Strawberry River
54 Tomahawk Creek
55 Turkey Creek
56 Two Prarie Bayou

CHAPTER TWO WATER POLLUTION CONTROL PROGRAMS

Watershed Approach

The watershed approach for water quality management in Arkansas was initiated in the early to mid 1970s with the development of Water Quality Planning Segments. Historically, the concept of managing water resources within watersheds originated as early as the 1890s by the U.S. Inland Waterways Commission. During this time and throughout the first half of the 20th century, the focus of water resources management was on efficient use of water resources for energy production, navigation, flood control, irrigation, and drinking water; instead of improving water quality. During the 1960s there was an increased emphasis on improving water quality, and in 1972 the Federal Water Pollution Control Act Amendment established a national goal of restoration and maintenance of the physical, chemical, and biological integrity of the Nation's waters.

One of the greatest challenges we face today is the conservation and restoration of our water resources. Our water resources provide a foundation for our quality of life. How we use and manage our water resources determines if we will continue to have a healthy environment in which to live. Today, in Arkansas, we enjoy an abundance of safe drinking water from our rivers and lakes, spectacular recreational places that support numerous outdoor activities and a diverse range of habitat that supports a variety of wildlife. All of these qualities give Arkansas its reputation as being the "Natural State."

Use of our natural resources contributes to the economic foundation of Arkansas, but how we use the land can affect the quality of our State's water resources. We must manage our resources in a way that results in conservation and protection of the State's scenic areas and restoration in places that have already been degraded. The watershed approach addresses multiple causes of environmental degradation, needed restoration, and future conservation. The watershed approach uses hydrologically defined areas (watersheds) to coordinate the management of water resources. This approach is advantageous because it considers all activities within a landscape that affect watershed health. The watershed approach integrates biology, chemistry, physiography, economics, and social considerations into decision-making. It considers local stakeholder input, as well as, national and state goals and regulations. A watershed approach recognizes needs for water supply, water quality, flood control, navigation, hydropower generation, fisheries, biodiversity, habitat preservation, and recreation; but it also recognizes that these needs often compete.

The watershed approach for water quality management in Arkansas was initiated in the early to mid 1970s with the development of Water Quality Planning Segments. In accordance with Section 303(e) of the Clean Water Act, wasteload allocation studies were performed to establish TMDLs (total maximum daily loads) for waters in each segment. Assessment of the State's water quality is based on individual stream reaches grouped by planning segments and based on watersheds. The statewide monitoring program and the NPDES permitting program are organized by these same planning segments. The planning segments are congruent with the hydrologic unit code (HUC) boundaries in USEPA's River Reach File. This allows GIS support with designation, characterization, assessment, and management.

Traditional environmental regulation does not effectively address water quality problems such as nonpoint sources, habitat degradation, and in-place sediments. The watershed approach provides an umbrella where local programs can be reinforced and their consistency with state- and basin-level objectives ensured. In Arkansas and surrounding states, the Arkansas Watershed Advisory Group (AWAG), coordinated by ADEQ, provides a unique opportunity to bring citizens and environmental professionals together to network and share information and resources. AWAG's mission is to assist interested citizens and organizations by promoting local approaches to watershed management and conservation. AWAG currently consists of over 48 local, state, and federal agencies, nonprofit organizations, and watershed councils. AWAG plays an important role in empowering local residents to participate in and to make educated choices about managing their natural resources.

AWAG was formed because a committee of citizens, agencies, and organizations expressed a desire to form an advisory group that would support a locally led approach to watershed management and conservation. The directors of the participating agencies and organizations made a commitment to support a locally led watershed approach by agreeing to participate in AWAG activities, provide a representative to attend meetings, and provide other resources and support as needed. In addition, citizen representatives were instrumental in giving a non governmental perspective to the group during AWAG's infancy and continue to play a vital role as members of AWAG.

The advisory group currently represents 48 agencies, organizations, and citizen groups (see text box). AWAG began in 2000 with 21 agencies and organizations and four citizens. The group began its formation just as a watershed group would, by developing a mission statement, goals, objectives, action items, and an operating structure. Four goals were established during the formation period and many activities and programs have addressed those four goals during the past five years.

Goal Statement I: "Promote the public's interest, understanding, and involvement in the management of their watershed resources"

Rural and urban communities are taking the initiative in protecting their natural resources. Local public awareness events have been hosted in watersheds across the state. These events, called Watershed Awareness Days, provide interaction between agencies, organizations, and local citizens. Citizens are given the opportunity to learn about programs designed to protect their natural resources at the local, voluntary level. Scientists and natural resource managers are given the opportunity to meet local residents and gain valuable local information.

Workshop topics have included TMDLs for land owners, grant writing, and Total Watershed Management. Presentations are given, by request, to interested groups on a variety of topics. ADEQ's watershed coordinator is also available to meet with small groups or individuals to provide direction concerning watershed planning. These citizens acknowledge that watershed based solutions depend on a basic general knowledge of natural resources, local cooperative efforts, and scientifically defensible research and data.

Goal Statement II: "Improve communication concerning watershed resources"

AWAG has encouraged interaction and communication among citizens, agencies and organizations by hosting Roundtable Discussions, quarterly AWAG meetings, and biennial statewide AWAG Conferences.

AWAG also provides a quarterly newsletter, *Watershed Watch*, and a comprehensive website, www.awag.org. Representatives give presentations, display posters, and provide other resources for environmental events such as the Upper White River Conference, Arkansas Game and Fish Stream Team Conferences, and other conferences. AWAG has been represented at the National River Network Conference for the past five years.

Goal Statement III: "Assist in providing technical support concerning watershed resources"

AWAG has become a planning and technical resource for local watershed groups. Representatives are committed to providing planning and technical assistance to watershed groups across Arkansas. A watershed group can request a technical advisor and a planning advisor attend meetings and help with group facilitation and watershed planning during the initial formation period. The technical advisor will continue to provide technical support after the formation period and assist with project planning and implementation.

Information about programs, agency services, and other technical training is made available through presentations, the AWAG website, the AWAG listserv, *Watershed Watch*, and in *The Arkansas Watershed Planning Guide* (ADEQ 2003).

Goal Statement IV: "Assist with funding issues for watershed resource management"

During the past seven years AWAG has focused on building sustainable watershed groups by providing assistance in formation and planning. The advisory group has hosted regional grant writing workshops which has produced several grants for watershed groups. A nonprofit information packet was created to provide watershed groups with checklists, state and federal forms, and sample bylaws and articles of incorporation. ADEQ's watershed coordinator is also available to assist in filling out the federal forms. Funding opportunities are posted in the Watershed Watch, on the AWAG website, and on the AWAG listserv.

Watershed Groups are Making a Difference

Watershed groups are making a difference by empowering local watershed residents to participate in and to make educated choices about managing their natural resources. Realistically, we have a lot of work to do in Arkansas and, it will take cooperative efforts from all stakeholders to restore and sustain our natural resources across the state. If you would like more information about AWAG or would like to receive the *Watershed Watch*, contact ADEQ at 501-682-0022 or forward your request through the AWAG website at www.awag.org.

Participating Agencies, Organizations, and Watershed Councils

AGENCIES

Arkansas Attorney General's Office
Arkansas Dept. of Environmental Quality
Arkansas Dept. of Health
Arkansas Dept. of Parks & Tourism
Arkansas Forestry Commission
Arkansas Game & Fish Commission
Arkansas Geological Commission
Arkansas Highway & Transportation Dept.
Arkansas Natural Heritage Commission
Arkansas Natural Resources Commission
Arkansas State Plant Board
Arkansas State University
Pulaski Technical College
U of A at Fayetteville
U of A Cooperative Extension Service
U of A at Pine Bluff
U.S.D.A. National Park Service
U.S.D.A. Natural Resources Conservation Service
U.S.D.A. Agriculture Research Service
U.S. Army Corps of Engineers
U.S. Fish & Wildlife Service
U.S. Forest Service
U.S. Geological Survey

ORGANIZATIONS

Arkansas Association of Conservation Districts
Arkansas Canoe Club
Arkansas Farm Bureau
Arkansas Rural Water Association
Arkansas Watershed Advisory Group
Audubon Arkansas
Beaver Lake Scientific Work Group
Beaver Water District
Central Arkansas Water
Rogers Water Utilities
The Nature Conservancy
Watershed Conservation Resource Center
Winrock International
Upper White River Basin Foundation

WATERSHED GROUPS

Bayou Bartholomew Alliance
Beaver Lake Partnership
Cache River Partnership
Citizens Protecting Lake Maumelle
Fourche Creek Coalition
Illinois River Watershed Partnership
Kings River Watershed Partnership
L'Anguille River Watershed Coalition
Lake Fayetteville Watershed Partnership
Leatherwood Creek Watershed Partnership
Upper Little Red River Partnership
Trout Unlimited (Lower Little Red River)
Lower Little River Watershed Coalition
Lower Mississippi River Conservation Committee
Lower White River Partnership
McKinney Bayou Watershed Partnership
Alliance for Improvement of Middle Fork Saline River (AIM)
Friends of North Fork/White River
Save Our Spring River
Upper White River Basin Foundation
West Fork of the White River Environmental Protection Association

Lee Creek, Crawford County, AR

Water Quality Standards

SURFACE WATER

Arkansas's water quality standards are based on data collection of the physical, chemical, and biological characteristics of least-disturbed streams within ecoregions that were established by land surface forms, potential natural vegetation, soil types, and land uses. All waters of the State have been designated to support multiple uses based on the potential attainability of the use.

Specific criteria to protect the designated uses of each waterbody were developed from the intensive ecoregion studies, an abundance of historical data, numerous additional scientific data, and considerable public and governmental agency input. These criteria include numeric values, narrative limitations, and prohibitions on physical alterations of certain waters. The aquatic life uses are specifically defined to provide a measure for aquatic life use support which includes community structure as well as toxicity limitations.

Standards were developed with data from least-disturbed reference streams with characteristics most typical of a particular Level 3 ecoregion. A single ecoregion can span from one edge of the state to the other and encompass two or three major river basins. The physical, chemical, and biological characteristics of one river basin within a particular ecoregion may or may not be similar to the characteristics within the other river basins in the ecoregion. In addition, the characteristics of transitions zones between ecoregions, the transition zone of a stream from a highland stream to a lowland stream, and the areas within atypical features of ecoregions may or may not be similar to typical ecoregion characteristics. Therefore, provisions are established in the water quality standards to allow modifications of the criteria and the designated uses of specific waterbodies based on current uses, the level of classification of the waterbody, and the social and economic needs of the area of concern.

GROUND WATER

Act 472 of 1949 designates ADEQ as the lead authority for development and implementation of ground water quality standards. Chapter 3 of Act 472 addresses water and air pollution. Section 8-4-102 (Definitions) include definitions for "pollution", "waters of the state", and "discharge into the waters of the state." Section 8-4-201 (Powers and duties of commission generally) gives the Pollution Control and Ecology Commission (Commission) the power "To make such classification of the waters of this state as it may deem advisable" and also "to administer and enforce all laws and regulation relating to the pollution of any waters of the state." The Commission is the sole enforcer of water quality standards. Section 8-4-202 (Rules and Regulations) assigns the authority to prescribe "water quality standards, performance standards, and pretreatment standards" to the Commission. Because "Waters of the state" include "…all bodies or accumulations of water, surface and *underground*…", the Commission is assigned authority to develop standards for the protection of ground water.

As part of ADEQ's 10-year Strategic Plan, the Department has committed to the development of state-promulgated ground water standards for protection of the State's ground water aquifers. A ground water task force was assembled with members from all the divisions of ADEQ charged with protection of ground water, with this task force conducting approximately 20 meetings from December 1994 through September 1995. The team studied the status of ground water protection within ADEQ, and also discussed the need for ground water standards, in addition to establishing a general format for those standards. A rough draft set of ground water standards were developed as one product from the task force. Several changes in federal policies concerning both ground water protection and contamination remediation put initiation of standards on hold, in order to evaluate the impact of the policy changes on existing legislation by the various ADEQ divisions. These changes included adoption of Region VI Human Health Media-Specific Screening Levels by ADEQ Brownfields Program, methodologies and established standards for evaluation of risk assessments at contaminated sites (ASTM and others), amendments to existing ADEQ regulations by many of the divisions, and other programmatic changes within the divisions charged with ground water protection. Emphasis on risk assessments demonstrated the difficulty of simply establishing numerical standards at all contaminated sites within the State. Establishment of standards must be done in a manner that will augment existing departmental regulations, provide a uniform, statewide set of criteria for defining and addressing ground water contamination, and fill existing gaps in ground water protection.

Water Division staff have recently updated a library of standards from other states within the United States that were first gathered in 1990 and 1991. Along with a thorough review of changes in regulations by other states, and in conjunction with a review of ADEQ regulations pertaining to the various divisions, the Water Division has assembled a new task force, which is charged with standards development. Each division member serving on the task force will review this list, and be prepared to address in writing and in future discussions the impacts, deficiencies, and needs within each of these criteria as related to ground water contamination remediation and prevention. The basic input from division representatives will include the problems faced by ground water personnel over the years in interpreting and applying existing regulatory language, in addressing loopholes and “grey areas” that have plagued efficient case management, and in defining what constitutes pollution and/or the type of ground water warranting protection. After a review of standards from other states and discussions with ground water personnel from other states, ADEQ should be able to draft a set of standards that will fully protect Arkansas ground water.

Point Source Control Program

The State of Arkansas continues to administer the NPDES No-Discharge Program (formerly the State Permits Program), which was initiated in 1949. On November 1, 1986, USEPA delegated the National Pollutant Discharge Elimination System (NPDES) program to the State. This Program is administered by the Permits Branch of the Water Division.

In accordance with the federal Clean Water Act, Section 303(e), Arkansas maintains a “continuous planning process (CPP)” to integrate the National Pollutant Discharge Elimination System (NPDES) Program, NPDES No-Discharge Program, the State’s water quality standards, and the Water Quality Management Plan (WQMP). The WQMP is the controlling document for issuing point source discharge limits statewide. As new information is developed, revisions to the WQMP are made in accordance with the public participation requirements of the Clean Water Act.

The No-Discharge Permits Section of the Permits Branch administers the No-Discharge Program, which issues permits relating to "No-Discharge" waste disposal systems (those that do not discharge directly to the Waters of the State). These systems are most commonly located at confined animal facilities, commercial facilities with septic tanks and leach fields, and centralized or decentralized wastewater treatment systems for residential developments. Permits are also issued for the land application of waste generated by different types of treatment facilities such as wastewater treatment plants, water treatment plants, poultry processing plants, food-processing plants, and drilling fluids from oil and gas field exploration activities. In addition, the Program manages the Underground Injection Control (UIC) Program, in conjunction with the Arkansas Oil and Gas Commission, and issues permits for salt-water disposal systems.

The Individual Permits Section of the Permits Branch administers Arkansas's NPDES program, which is patterned after the USEPA program utilizing federally approved forms for permit application and monitoring reports. The Department has adopted, by reference in Regulation No. 6, most of the federal regulations applicable to a wastewater discharge permitting program. The distribution of Arkansas's major and selected minor NPDES permits is illustrated in Figure II-3.

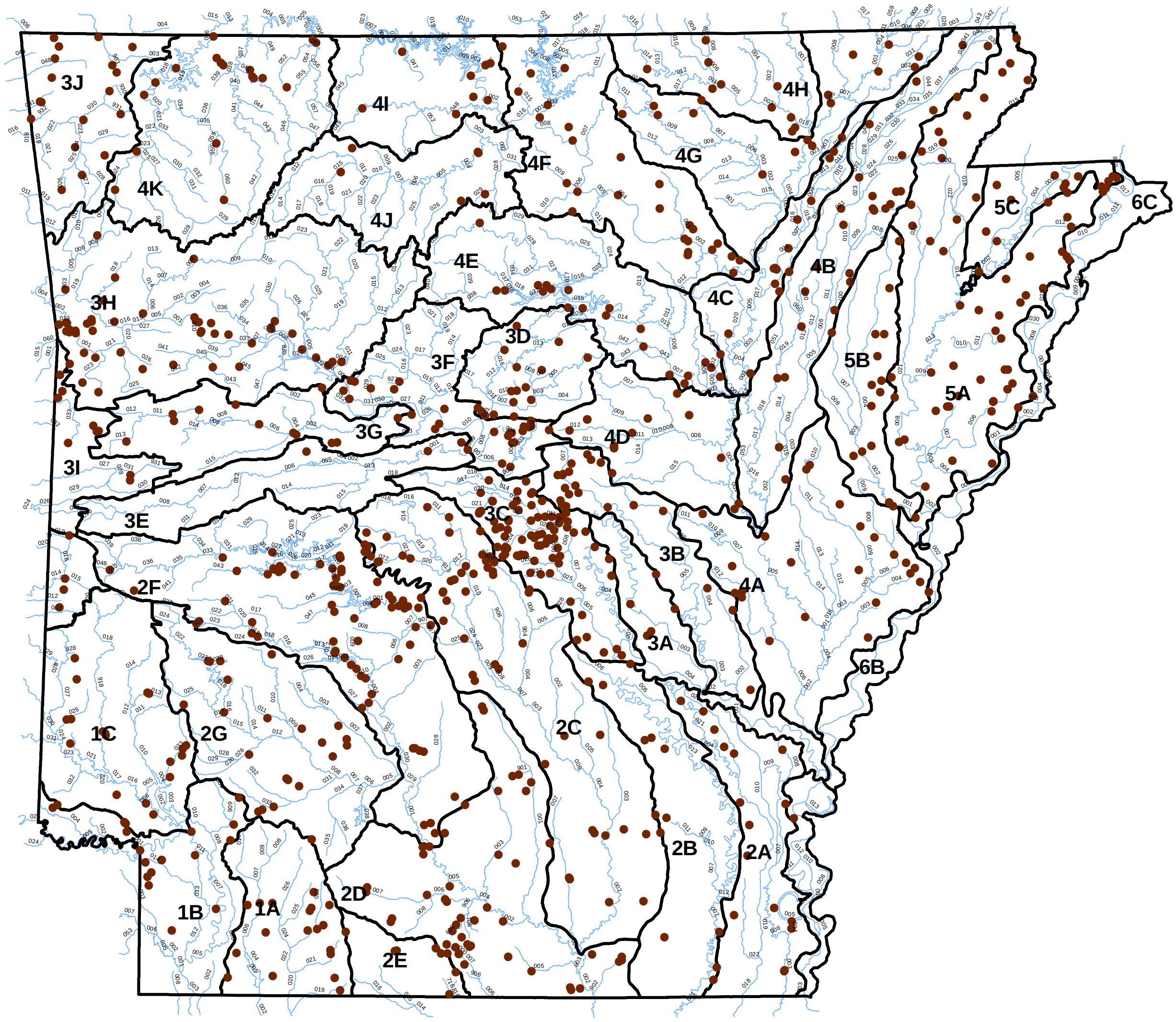
Storm Water Requirements

The Storm Water Section (SWS) of the Permits Branch manages three general permits and one individual permit covering various storm water discharges. The Construction Storm Water General Permit (ARR150000) covers any type of construction activity that is subject to permitting requirements. This general permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) using Best Management Practices (BMPs) to control storm water contamination from erosion and other waste generated at a construction site. The SWPPP must include a detailed description of the construction project; a detailed site map showing drainage, erosion controls, discharge locations, etc.; a description of the erosion controls used on the site; inspection and maintenance procedures for the erosion controls, documentation for Total Maximum Daily Load (TMDL) and Water Quality Standards compliance; and certifications.

Industrial Storm Water General Permits (ARR000000) cover the 11 categories of industry types that are required by the federal regulation to obtain storm water permit coverage. In addition, 12 industry types covered under the permit are required to monitor their storm water discharges on an annual basis for various pollutants. This general permit requires the development of a SWPPP using BMPs to address the reduction in pollutants exposed to the storm water runoff and/or removal of the pollutants after the storm water has been contaminated. The SWPPP must include a list of personnel that will inspect the facility, a non-storm water certification, good housekeeping, spill prevention and response, and inventory of exposed material.

The Small Municipal Separate Storm Sewer System (MS4) General Permit (ARR040000) covers all of the regulated Small MS4s in the state. This general permit requires the development of a Storm Water Management Plan (SWMP) to address the six minimum control measures: public education, public participation, illicit discharge detection, construction site control, post-construction control, and good housekeeping, as required by federal regulation.

Figure 2-1: NPDES Permitted Facilities



The Individual MS4 Permit (ARS000002) covers the storm sewer discharges form the City of Little Rock and the Arkansas State Highway and Transportation Department. This permit requires the development of a program to address the same basic measures as the ARR040000 general permit. This permit also requires the co-permittees to sample the storm water discharges from the permitted outfalls on a quarterly basis.

Point Source Impacts Monitoring

The impacts from major point source discharges of concern are monitored primarily through strategically located water quality monitoring stations within the statewide Ambient Water Quality Monitoring Network. The water quality data collected at these stations enables the Department to monitor the discharges from the permitted facilities and identify areas of concern needing enforcement or some other type of abatement activity. The data can also indicate improvement of water quality conditions resulting from pollution control activities. In addition, self-monitoring through monthly discharge monitoring reports is required in the NPDES permits of most dischargers (see enforcement).

Toxics Strategy

Since FY87, the Department has utilized toxicity testing as a monitoring tool to measure compliance with its narrative toxicity standard, which states "Toxic materials shall not be present in receiving waters, after mixing, in such quantities as to be toxic to human, animal, plant or aquatic life, or to interfere with the normal propagation, growth and survival of the indigenous aquatic biota." The actual intent of the toxics strategy is that there shall be no discharge of any wastewater from any source that:

1. Results in the endangerment of any drinking water supply;
2. Results in aquatic bioaccumulation which endangers human health;
3. Results in any in stream acute or chronic aquatic toxicity; or
4. Violates any applicable general or numerical state or federal water quality standard.

The toxicity testing program consists of both self-monitoring conducted by the permittees and compliance monitoring conducted by the State. The State has been and will continue to implement the post-third round permit policy endorsed by USEPA Region 6, with minor revisions. Whole effluent toxicity testing requirements are included in all major and selected minor permits.

In 1991, the Arkansas Pollution Control and Ecology Commission (APCEC) adopted specific numeric criteria for 12 pollutants in terms of their acute and chronic toxicity (Reg. 2.508 of Regulation No. 2). On December 22, 1992, USEPA promulgated numeric criteria for 10 heavy metals and cyanide into Arkansas water quality standards. These criteria were initially expressed as total recoverable metals. Later USEPA modified these values by applying a conversion factor to the total recoverable values and expressed them as dissolved values. The promulgated standards for chromium(VI), mercury and cyanide are expressed as a function of the pollutant's water-effect ratio (WER), while standards for cadmium, chromium(III), copper, lead, nickel, silver, and zinc are expressed as a function of the pollutant's WER and as a function of hardness. In January 1998, the Commission adopted the National Toxics Rule numbers previously promulgated by USEPA as a part of the State's water quality standards.

When NPDES permit applications are submitted, in stream waste concentrations (IWC) for all potential pollutants for which there is no adopted state standard are calculated and compared to values listed in the Quality Criteria For Water 1986 (Gold Book). If toxicity values published in the Gold Book are exceeded by the calculated IWC, whole effluent toxicity testing is required.

Self Monitoring for Toxicity

Whole effluent toxicity (WET) testing is required in 112 major and significant minor industrial NPDES permits. Lethal and sub-lethal effects were observed in 5 percent of 6,866 WET tests submitted by these permittees.

Seventy-six municipal permittees performed 4,285 WET tests from July 2002 through June 2007. In approximately 2 percent of these tests lethal effects were observed; sub-lethal effects were observed in 4 percent of the tests.

Two federal permittees performed a total of 164 WET tests from July 2002 through June 2007. In approximately 3 percent of these tests lethal effects were observed; sub-lethal effects were observed in 10 percent of the tests.

Twelve facilities are performing, or have completed, Toxicity Reduction Evaluations (TREs) from July 2002 through June 2007. Depending on the results of the TREs, these facilities have either discontinued or relocated discharges, or improved treatment capabilities.

The NPDES General Permit number ARG340000, Petroleum Storage and Transfer Facilities, was first issued on July 13, 1989. The general permit did not require WET testing. With the issuance of a renewal permit on December 1, 1994, monthly acute WET testing requirements were included for outfalls that discharged petroleum tank bottom and petroleum transfer process water. During this round of the general permit, 15 permittees were required to conduct the monthly WET testing. This monthly acute WET testing requirement was continued in the renewal permit issued on April 1, 2000, for petroleum tank bottom process water only. During this round of the general permit, only one additional permittee was added to the facilities required to conduct WET tests; eight permittees were removed due to termination of their general permits. The same WET testing requirement was continued with the renewal permit issued on October 1, 2005. At the present time, 11 permittees are required to conduct WET testing under the NPDES General Permit number ARG340000.

The NPDES General Permit number ARG790000, Dischargers of Treated Ground Water, are issued for short duration discharges, which sometimes only last for several months. The initial general permit was first issued on April 10, 1990. The initial general permit contained monthly acute WET testing requirements for all treated ground water discharges (Outfall 101), which included all permittees covered by the general permit. During this initial round of the general permit, 18 permittees were required to conduct the monthly WET tests; 18 permittees were also removed due to termination of their general permits. With the issuance of a renewal permit on March 1, 1995, the monthly acute WET testing requirements were continued for Outfall 101. During this round of the general permit, eight additional permittees were required to conduct the monthly WET tests; eight permittees were also removed due to termination of their general permits. The same WET testing requirement was continued in the renewal permit issued on February 1, 2001. During this round of the general permit, 12 additional permittees were added to the facilities required to conduct WET tests; 12 permittees were also removed due to termination of their general permits. The WET testing requirement was again continued with the renewal permit issued on April 1, 2006. At the present time, 13 permittees are required to conduct WET testing under the NPDES General Permit number ARG790000.

When the general storm water runoff permit for industrial activity (ARR000000) was first issued on October 1, 1992, acute toxicity testing was required for approximately 220 facilities. These facilities fell under the first three monitoring categories found in Part V.B of the general permit. After the first three years of the permit, these requirements were removed for those facilities that successfully passed the requirement (approximately 60 %).

Testing was required on a quarterly basis from 1996 until the general permit was renewed on October 1, 1998. During this time, 60 of the 90 facilities were able to pass the quarterly acute toxicity testing. When the general storm water runoff permit for industrial activity (ARR000000) was renewed, the WET testing requirements were not continued. The facilities that were still having trouble passing the WET testing requirements (approximately 30) were placed back on annual testing until they passed two consecutive tests. As of October 1, 1998, 16 industrial facilities were required to conduct annual acute WET tests. From October 1, 1998, to December 31, 2001, permits expired or WET testing was no longer required for several facilities leaving five facilities still sampling. The general storm water runoff permit for industrial activity (ARR000000) was renewed again on April 1, 2004, with a modification issued on February 1, 2005. Since the issuance of the most recent permit, a few facilities have tested out of the WET testing requirements. Currently, three facilities are required to conduct WET testing yearly, using acute toxicity tests.

Certification of Monitoring Data

Pursuant to the provisions of Act 322 of the 79th General Assembly of 1993, the Arkansas Pollution Control and Ecology Commission established mandatory certification for certain environmental testing laboratories. This Act clarifies the Department's existing power to refuse to accept invalid test results and expands the enforcement powers over environmental testing. Chapter 8, of Regulation No. 9, establishes the fee system for laboratory certification. As of December 2007, 89 environmental testing laboratories have received certification from the State of Arkansas, with 25 of those being within Arkansas.

Enforcement

Enforcement responsibilities fall under the Enforcement Branch. Those facilities subject to ongoing enforcement actions by USEPA at the time of program authorization remain the responsibility of USEPA until the facility is in compliance. The State has enforcement responsibility for the remainder. The primary basis for enforcement is the self monitoring data submitted by permittees on monthly discharge monitoring reports (DMRs) and routine compliance inspections performed by the Department. All DMR data is entered into the Permit Compliance System (PCS) national database. The State addresses all permit violations reported by permittees through an informal enforcement action, initially; an escalation of enforcement actions occur if the violation is not resolved. Other violations are judged on their severity and actions are taken as necessary.

Wastewater Licensing/Training

Wastewater treatment plant operator licensing and training continues to be a necessary and integral part of the overall scope of the point source pollution control program. The licensing and training verification program administered by the Wastewater Licensing Section, Water Division of the Department, operates within the authority of Arkansas Act 211 of 1971, as amended, and Act 1103 of 1991. These Acts set the requirements by law that requires a licensed operator at most wastewater treatment facilities in Arkansas. Act 211 has required licensed operators at Publicly-Operated Treatment Works (POTW) since 1971. Act 1103 of 1991 added the requirement for the licensing of industrial operators. There are approximately 3000 licensed operators in Arkansas, which includes both municipal and industrial operators. Classification of wastewater treatment plants by the unit processes determine the level of operator staffing and the licensing level of the plant operators.

Most training of wastewater treatment plant operators is accomplished by the Arkansas Environmental Academy, a branch of Southern Arkansas University located at Camden, Arkansas, and the Arkansas Rural Water Association, Lonoke, Arkansas. Over 100 training sessions are accomplished annually with offerings in all phases of wastewater training at various state locations by the faculty and staff. Other sources of training are provided by private contractors, formal organizations, and other institutions of higher learning.

Nonpoint Source Control Program

In 1988, ADEQ conducted a nonpoint source assessment and prepared a management plan pursuant to Section 319 of the Clean Water Act, as amended by the 1987 Water Quality Act. This assessment and portions of the original management program were approved by USEPA Region 6 nonpoint source program personnel.

In 1996, the former Arkansas Soil and Water Conservation Commission, now the Arkansas Natural Resources Commission (ANRC), was designated as the Nonpoint Source Program Management Agency and the lead agency for the Agriculture nonpoint source category; the Arkansas Forestry Commission assumed the responsibilities for the silviculture category and ADEQ has retained the responsibility of assessing and reporting on nonpoint source pollution and the responsibilities associated with Resource Extraction (mining). ADEQ and ANRC share the responsibilities of the Surface Erosion and Household and Business Activities categories. The Nonpoint Source Management Task Force prioritize watersheds at an 8-digit Hydrologic Unit Code (HUC) scale. The 8-digit HUCs are further broken down into 12-digit HUCs to facilitate focus in implementing projects in critical areas. In addition, both of these entities and numerous other cooperators lend assistance to each of the priority watersheds.

Assessment

The initial Arkansas Nonpoint Source Pollution Assessment, 1988, assessed approximately 36 percent of the 11,900 stream miles in the State. Based on assessment criteria established in 1988, 58 percent of the assessed streams were not meeting all designated uses. Limited data for the 79 significant publicly owned lakes indicated no use impairment. There was also inadequate data to identify specific areas of ground water impairment. The 1988 assessment identified agriculture and mining as the primary categories of nonpoint source (NPS) pollution in the state.

The 1988 assessment was updated in June 1997 using updated assessment criteria. The 1997 report assessed 8,700 stream miles and indicated that NPS pollution was impacting (but not necessarily impairing) over 4,100 stream miles. Agricultural activities were identified as the major cause of impacts on 3,197 stream miles. Other impacts were related to silviculture activities, road construction/maintenance activities and unknown sources. The unknown source was mercury contamination of fish tissue.

To reduce the confusion between the Nonpoint Source Assessment Report and this document, ADEQ no longer publishes a separate nonpoint source assessment report. This document, updated every two years, serves as the nonpoint source assessment report.

Management Program

The Arkansas Nonpoint Source Pollution Management Plan is developed and implemented by ANRC, and was updated and fully approved in 2005. It provides for continued monitoring of water quality, research into the effectiveness of Best Management Practices (BMPs), and implementation strategies of BMPs to reduce nonpoint source pollutants.

Recent/Current Activities

Strawberry River - ADEQ completed a physical, chemical, and biological water quality assessment of the Strawberry River watershed in December 2003. Results from the survey indicated that seven stream segments were not fully supporting the aquatic life designated use because of excessive in stream turbidity and that eight stream segments were not fully supporting the primary contact recreation use because of excessive fecal coliform bacteria concentrations (see Appendix A, Planning Segment 4G). The main source of the turbidity was thought to be from unpaved county roads, stream bank erosion, and adjacent pasture land. The main source of the fecal coliform bacteria was thought to be from adjacent agriculture land use activities. A total maximum daily load for silt was completed in 2006.

Middle Fork Little Red River - ADEQ completed a physical, chemical, and biological water quality assessment of the Middle Fork of the Little Red River in central Arkansas in October 2004. The objective of the survey was to better and more accurately assess the water quality in the Middle Fork and to develop the data necessary to prepare a TMDL, if needed. The data generated from the survey indicated that the Middle Fork of the Little Red River is fully attaining all water quality standards and fully supporting all its designated uses. However, low dissolved oxygen concentrations do exist in some areas during periods of low-flow and summer time ambient temperatures. There are also some areas of concern relating to 1) the point source discharger in the watershed; 2) the elevated turbidity concentrations during periods of high runoff caused by the large, spring-time storm events; and 3) the damage to in stream habitat caused by short-term gravel removal activities.

Middle Fork Saline River – ADEQ, in cooperation with the United States Geological Survey in Little Rock, initiated a survey to determine the effects that urbanization is having on the Middle Fork Saline River watershed in central Arkansas. Several tributaries to the Middle Fork Saline River have been dammed to create small recreation lakes in and around a gated retirement community. The reduced normal flows caused by the dams in conjunction with urbanization of the watershed could have negative effects on the aquatic life of the River. A final report for the survey is scheduled to be completed in early 2008.

Cove Creek - ADEQ initiated a physical, chemical, and biological survey of the Cove Creek watershed in Central Arkansas in 2007. Cove Creek receives acid mine drainage from a mine pit and from runoff from spoil piles and unreclaimed mined areas. Low pH levels and high concentrations of metals have impaired the designated uses of the creek. The data generated by the survey will be used to better delineate the impairments to the creek and to develop TMDLs.

Other Activities – Pursant to USEPA Measures WQ-10 and SP-12, ADEQ is currently assisting ANRC with establishing water quality monitoring sites along various stream segments within nonpoint source priority watersheds. The objectives of these sites are 1) to evaluate the effectiveness of BMPs in controlling nonpoint sources of pollution; 2) to try to detect any improvements in water quality; and 3) to develop additional data for designated use attainment evaluations and possibly for TMDL development where necessary.

CHAPTER THREE COST /BENEFIT ANALYSIS

The CWA requires states to provide an "estimate of the environmental, economic and social costs and benefits needed to achieve the CWA objectives and an estimate of the date of such achievement." A comparable procedure is needed to conduct a statewide economic analysis of environmental, economic, and social costs, but that procedure does not currently exist.

A true costs/benefits assessment (CBA) will require assessment of the value of incremental improvements in water quality from a variety of programs, some of which were implemented within the previous reporting cycle (Phase 2 storm water Regulations, for example). Water quality assessment methodologies presently are inadequate to truly capture the benefits of CWA implementation on water quality. While ADEQ has monitored water quality as directed by CWA §305(b) guidance provided by the USEPA, these protocols are biased towards reporting failures, with little provision for reporting successes.

USEPA implemented the Wadeable Streams Assessment Protocol (WSAP) for statistically assessing water quality of wadeable streams across the central and eastern US during FY 2004 to address this concern. ADEQ participated in this process through the University of Arkansas, sampling 30 randomly selected sites in Arkansas across four ecoregions, in collaboration with USEPA Region 6. Those data are not yet available for reporting, but will be available by the next reporting cycle, and will be included in that analysis at that time.

In addition, recent advances in valuing benefits such as ecological services may provide insight into the true benefits of CWA regulations that have not been represented economically in previous assessments. However, protocols for including those benefits are not yet established. Therefore, pertinent accessible information has been utilized for this water quality CBA in order to provide the required information under the CWA. Future water quality reports will provide a more comprehensive CBA that will address questions critical for the effective management of water quality in Arkansas.

Cost Information

It is difficult to separate out the costs attributable to water quality pollution control efforts across state, regional, and local governments. The environmental benefits from the environmental resources protected by ADEQ are more important than ever, as evidenced by implementation of programs by agency personnel across Arkansas.

The costs for implementing CWA regulations are summarized in this report as agency programmatic implementation expenses, pollution abatement capital expenditures and operating costs for Arkansas. Much of the water quality related budget is self-generated through permit fees; however, a portion is derived through federal grants (Table II-1). These include the §104 grant for research investigations, training and informational demonstrations; §106 grant for water pollution control activities; the §319 grant for nonpoint source management issues, and the §604 grant for state water quality management planning activities. Money from each of these grants is divided throughout the appropriate water-quality related state program as directed by each grant, and provides funding for personnel, equipment, survey and research work, and ambient monitoring. Total costs for FY2005 were estimated at over $13.8 million (Table II-1).

Table II-1: Summary of Costs Associated With Implementing CWA Programs in Arkansas for FY 2005.

Funding Source	**Principal Activities**	**Program Cost (FY 2005)**
State Budget - ADEQ	Permitting and enforcing CWA provisions in Arkansas	$3,699,586
State Budget - ANRC	Nonpoint source pollution prevention, control, and remediation	$3,260,900
Federal CWA §104 Budget	Assess overall quality and ecological characteristics of Arkansas's water bodies	$315,000
Federal CWA §106 Budget	General water pollution control/water quality management program	$2,683,019
Federal CWA §319 Budget	Prevent, control, and remediate nonpoint source pollution throughout Arkansas	$3,800,000
Federal CWA §604 Budget	Survey work on streams not meeting designated uses	$100,000
	TOTAL	**$13,858,505**

State of Arkansas Budget for Water Quality Control Activities

ADEQ has primary responsibility for permitting and enforcement of CWA provisions in Arkansas, but the implementation of water quality control activities are distributed across several state agencies, including ADEQ, ANRC, Arkansas Department of Health (ADH), Arkansas Rural Water Association of Arkansas (ARWA), and the Arkansas Agriculture Department (AAD), among others. The state budget for ADEQ water quality control activities for 2005 included $896,525 in general program funds, $73,283 in waste water licensing, $2,624,443 in permit fees, and $105,335 in environmental education fees, for a total of $3,699,586 (Table II-1). Funds received through penalties, fines, and other actions are returned to State funds for redistribution. In FY 2005, ANRC and its partners spent $3,260,900 in non-federal funds for nonpoint source pollution prevention, control, and remediation.

Federal CWA Section 104 Budget

Research monies provided by §104 grants support the activities within ADEQ to assess overall quality and ecological characteristics of Arkansas's water bodies. In 2005 ADEQ received $315,000 in Federal funding for these activities.

Federal CWA Section 106 Budget

The §106 grant program provides funding for general water pollution control/water quality management program. Activities include ambient water quality monitoring, assessment of data, development of the *Water Quality Inventory* (now known as the Integrated Report), revision of Arkansas's Water Quality Management Plan, development and revision of surface water quality standards, development and issuance of waste water discharge permits, compliance inspections, complaint investigations, and development of enforcement actions. In 2005 ADEQ received $2,683,019 in Federal funding for these activities.

Federal CWA Section 319 Budget

The CWA §319 grant for nonpoint source management issues in Arkansas is implemented by the Arkansas Natural Resources Commission (ANRC). ANRC works with universities, city and regional officials, private industry, and the federal government to prevent, control, and remediate nonpoint source pollution throughout Arkansas. In 2005 ANRC completed 39 multi-year projects, managed 26 on-going projects, and initiated 19 new projects that target NPS pollutants from urban runoff, forestry, agriculture, sand and gravel operations, and on-site waste treatment systems. Furthermore, ANRC worked with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service to implement 26 Best Management Practices (BMPs) designed to improve environmental quality on more than 1,100 Arkansas farms. This has resulted in load reductions of more than 50,000 lbs phosphorus, 176,000 lbs nitrogen, and 24,000 lbs of sediment in 2005 within Arkansas. ANRC continues to work closely with USDA to make progress in reducing nonpoint source pollutants and improving water quality. Part II, Chapter 2, Nonpoint Source Pollution Control has more information on this topic as well as other efforts by the Nonpoint Source Program (see ANRC 2005 Annual Report, ANRC, Little Rock, AR). In 2005 ANRC received $3,800,000 in Federal funding for these activities.

Federal CWA Section 604 Budget

Section 604 grant is used to fund work on streams not meeting designated uses. The surveys provide data for development of total maximum daily loads (TMDL) and waste load allocations (WLA) andassists permit writers in establishing water quality protective effluent limits. In 2005 ADEQ received $100,000 in Federal funding for these activities.

Benefits Information

Arkansas has over 283,000 hectares (699,293 acres) of surface water with some 11,900 miles of streams and rivers and more than 500,000 acres of lakes. Over 800 billion liters of high quality ground water are contained in aquifers capable of yielding over 2,000 liters per minute. The Agriculture, Forestry and Fishing Industries accounted for $3.154 billion or 3.9 percent of Arkansas Gross State Product (GSP) in 2004 (Arkansas GSP: $80.902 billion). [1]

1 Information concerning the dollar values of Agriculture industry and GSP is available at the Bureau of Economic Analysis website: http://www.bea.gov/bea/regional/gsp.htm

Fishing and Aquaculture Benefits

Arkansas is renowned for fishing and hunting, as well as a myriad of water related recreational activities including sailing and scuba diving. Many of the streams in Arkansas are utilized for recreational floating. The quality of recreational fishing is directly related to the quality of surface water in Arkansas. Three current world-record fish (brown trout, walleye and hybrid bass) were hooked in Arkansas waters. There are 18 high-profile waterways for canoeing/rafting/kayaking in Arkansas: Big Piney Creek, Buffalo River, Caddo River, Cadron Creek, Cossatot River, Crooked Creek, Eleven Point River, Illinois Bayou, Kings River, Little Missouri River, Little Red River, Mulberry River, Ouachita River, Saline River, Spring River, Strawberry River and White River.[2]

Arkansas is an important state nationally for aquaculture. Specifically, Arkansas ranks second in the U.S. in catfish production, and leads the nation in baitfish, goldfish, sport-fish, largemouth bass, hybrid striped bass, and Chinese carp production. Aquaculture has a total economic impact of over $1.1 billion in Arkansas, primarily in the impoverished Delta region. In Chicot County alone, the catfish industry accounted for 2,665 jobs and $22 million in tax revenue.[3]

Recreational fishing is a major tourist attraction for Arkansas contributing $446 million to the State's economy annually through direct expenditures. In 2001, 782,000 people (residents and non-residents) over the age of 16 fished a total of more than 13,000 days. They spent almost $184 million on trip-related expenses, and almost $208 million on equipment. Thus, aquaculture and fishing, which benefit directly from water quality, provide $1,456 million in direct and indirect benefits to the State of Arkansas.[4]

Hunting Benefits

The most recent year for which data exists regarding the economic impact of hunting is 2001. In that year, Arkansas had 430,694 registered hunters with an economic impact for all hunting-related activities of $905,815,861 based on direct, indirect, and induced effects. The impact of deer hunting during that period was over 42 percent of the total value, or $383,007,221. The economic impact of migratory waterfowl and upland bird hunting was almost 30 percent of the total, or $270,286,245. Clearly, not all of this nearly billion-dollar industry is dependent on or resulting from water quality, but a significant portion of the deer and migratory waterfowl industry benefits from and is dependent upon well-managed water resources. A conservative estimate of the benefit derived from high quality water for those two hunting components would be 50 percent, resulting in a direct benefit of approximately $327 million in total benefit from hunting.[5]

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2 Information is available at the Arkansas Department of Parks and Tourism website:
http://www.arkansas.com/outdoors/default.asp
http://www.arkansas.com/outdoors/fishing/
http://www.arkansas.com/outdoors/Canoeing-Rafting-Kayaking/

3 The Aquaculture/Fisheries Center of Excellence at the University of Arkansas at Pine Bluff.
http://www.uaex.edu/aqfi/research/

4 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Arkansas, U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau

5 2001 Economic Importance of Hunting in America, The Animal Use Issues Committee of the International Association of Fish and Wildlife Agencies, Washington, DC

Eco-Tourism Benefits

Eco-tourism in Arkansas is calculated as the combination of watchable wildlife recreation (particularly bird watching) and general tourism less special attractions, hunting, fishing, and historic tourism. For 2001, the most recent year for which data is available, 841,000 people participated in watchable wildlife activities. Anecdotal evidence suggests the number of eco-tourists visiting Arkansas has escalated significantly with the possible discovery of the ivory-billed woodpecker in the Cache River area, but hard data are not yet available. The total economic benefit of wildlife watching in Arkansas in 2001 was almost $456 million, most of which was for equipment (Table II-2).

The Arkansas tourism industry experienced a year of record growth in 2004, with travel expenditures increasing from $3,942,501,328 to $4,253,958,933 (7.9%). Visitors increased from 19,668,336 to 20,691,089 (5.2%). These estimates are calculated using the *Travel Industry Association of America (TIA) 2001 Impact of Travel on Arkansas Counties* as a reference. During 2004, visitors to Arkansas totaled 20,691,000 person-trips. Visitors spent an average of $205.60 per trip, resulting in $4.3 billion in total travel expenditures, $238 million in state taxes and $89 million in local taxes. The Arkansas travel industry employed 59,287 persons and paid $940 million in wages and salaries. When asked the main purpose of their trip during Welcome Center Surveys, visitors surveyed responded in order of preference: visiting friends or relatives (39%), sightseeing (18%), entertainment (15%), business (9%), recreation (9%), family affairs (7%) and other (3%). According to the Internet Conversion Study (2004), tourists participated in the following activities: sightseeing (36.8%), attractions (7.0%), historic sites (3.9%), camping (16.0%), hiking (5.1%), fishing/hunting (6.7%), water sports (4.4%), bird watching (0.3%), other (7.8%). Separating bird watching from the total, the remaining eco-tourism benefit statewide during 2004 was estimated at 25.5 percent of total tourism. A conservative estimate of the economic benefit derived from well-managed water resources to ecotourism would be half of all ecotourism, or 13 percent of the total, for an economic benefit of more than $553 million plus half of bird-watching ($237 million) for a total impact of $790 million. The perception of clean water is central to the advertising campaign of Arkansas as the “Natural State.”

Water-Critical Industry Benefits

The principal industries in Arkansas are manufacturing, agriculture, forestry, business services, and tourism (Table II-3). These industries are dependent upon, and thus benefit from, high quality water resources. Determining the direct benefits from CWA implementation to these industries is difficult due to a wide variety of intermingled variables. However, a conservative estimate of the benefit of implementing the CWA, and thus achieving high quality water, can be made by subtracting fishing from the Agriculture, Forest, and Fishing category, and considering a marginal value of 10 percent for high quality water. The benefit to industries in Arkansas from implementing the CWA was estimated to be $1,049 million.

Table II-2: 2001 Economic Impacts of Watchable Wildlife Recreation in Arkansas

	Resident	Non-Resident	Total
Retail sales	$232.0 million	$11.9 million	$244.0 million
Salaries & wages	$101.2 million	$4.8 million	$106.0 million
Full & part-time jobs	4,532	238	4,770
Tax revenues:			
State sales tax	$12.0 million	$957,000	$12.9 million
State income tax	$5.0 million	$260,000	$5.2 million
Federal income tax	$14.9 million	$783,000	$15.7 million
Total economic effect	$454.1 million	$21.7 million	$475.7 million

Data source: The 2001 Economic Benefits of Watchable Wildlife Recreation in Arkansas (Report prepared for the Arkansas Game and Fish Commission.)

Table II-3: Economic Benefits from Industries in Arkansas by Category, 2004

Industry Category	2004 Revenues (million)	Percent GSP ($80.902 billion)
Agriculture, Forestry & Fishing	$3,154	3.9
Nondurable Goods Manufacturing industry	$7,095	8.8
Accommodation and Food Services industry	$1,784	2.2
TOTAL	$12,033	14.9

Source: Arkansas Department of Economic Development, Bureau of Economic Analysis

Summary of Benefits

The cumulative benefits of implementing CWA programs in Arkansas for FY 2005 were estimated to be more than $3.7 billion (Table II-4). These benefits are rough estimates made with a variety of assumptions, many arbitrary in their magnitude. However, these assumptions were conservative (that is, likely underestimated) and based upon the most recent data available. In addition, these estimates do not consider other critical benefits that were not available for this CBA, including the cost of water treatment for drinking water, the health effects of untreated poor quality water, etc.

Table II-4: Summary of Benefits Associated With Implementing CWA Programs in Arkansas for FY 2005.

Economic Source	**Principal Activities**	**Economic Benefits (Million)**
Fishing	Aquaculture and recreational fishing	$1,546
Hunting	Migratory waterfowl and riparian game (deer, upland game birds)	$327
Ecotourism	Bird watching, recreational water sports, etc.	$790
Water-Critical Industries	Ag, forestry, manufacturing, accommodations, etc.	$1,049
	TOTAL	**$3,712**

Cost/Benefit Assessment

In conclusion, based upon the data collected, analyzed, and reported in this CBA, the costs for implementing the CWA in Arkansas in FY 2005 were approximately $13.86 million, and benefits were $3,712 million. Thus, the State of Arkansas received more than 267 times return on each dollar invested in implementing the CWA in FY2005.

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CHAPTER FOUR SPECIAL STATE CONCERNS

Areas of special concern within the State's Water Pollution Control Program include many of the national concerns and priorities as well as state or area specific issues. These concerns extend from wide range, philosophical concerns impacting long range goals and objectives to area-specific or issue-specific concerns that can be addressed within a short term program cycle. Many of these concerns are listed below simply as an exercise of compiling thoughts, which are likely to shape future activities.

1. Ground water standards should be developed to reflect existing water quality in different aquifers and different regions of the State; similar to the ecoregion approach to the protection of surface waters.

2. A statewide ground water quality database and/or more effective data management process should be developed to improve access across programs by other agencies and the private sector.

3. More effective methods are needed to identify NPS (nonpoint source) impacts and their causes. This will require the use of in stream biotic indicators, rather than conventional water quality parameters. A Biological Stream Condition Assessment will be developed to address these concerns.

4. The formation of local watershed groups for water bodies listed as impaired will be critical in getting local "buy-in" to address the sources of impairment.

5. The expansion of an active program to control excessive turbidity and silt loading to water bodies is needed. This should include procedures to control major sources such as stream bank erosion, road construction and maintenance, streambed gravel removal, shale gas drilling operations, and runoff from urban construction sites. Current programs include the USEPA Storm water Phase I and II programs implemented through the NPDES program; Arkansas Stream Teams stream bank restoration activities; and the Arkansas Nonpoint Source Program implemented by the Arkansas Natural Resources Commission.

6. The Department is currently developing a strategy to address nutrient impacts to the State's waterbodies. The strategy will first focus on the State's water supply reservoirs and those waterbodies of outstanding ecological or economical value.

7. The Department needs to consider the protection of the existing, naturally occurring wetlands through a mechanism other than discharge permits for dredge and fill materials, which are being extended into farmed fields and address only limited activities.

8. The Department needs a comprehensive, multi-discipline approach to ground water protection through total interagency cooperation in both investigating and preventing ground water contamination.

9. As increasing demands are exerted on water quantity, flow and/or volume of water must be considered in protecting specific designated uses. Developing information to expand our knowledge of quality vs. quantity in protecting designated uses is vital.

10. Encourage the establishment of land use zoning and watershed management plans at local levels to facilitate the development/protection of the State's ground and surface water resources.

11. The Department needs continued and increased implementation and management (educating contractors) of the Phase II water regulations that went into effect in November, 2003; Phase II storm water regulation affects the smaller municipalities and all construction activities larger than one acre.

12. As the need to move from ground water to surface water for irrigation purposes continues to grow, more and more waterways are going to be used as a transport mechanism for irrigation waters. The long-term affects on the physical, chemical, and biological aspects to the streams and bayous is unknown; this activity could have devastating effects on these ecosystems.

13. Continue and improve cooperation between state environmental agencies for Source Water Protection of both ground water and surface water supplies through frequent communication, data sharing agreements, and cooperative efforts, and explore ways to increase interest and involvement of county and local governments in protection of their drinking water sources.

14. Establish more stringent turbidity and *E. coli* standards for any stream reach or reservoir with has an existing use as a public water supply source.

15. Improve coordination, communication, and cooperation among the state agencies with watershed management, watershed protection, and watershed education programs.

16. Encourage and assist local and county governments in developing and implementing watershed management plans for both surface and ground water resources.

PART III SURFACE WATER ASSESSMENT

CHAPTER ONE SURFACE WATER MONITORING PROGRAM

The ambient river and stream monitoring program, which began in 1974, was an expansion and modification of an earlier interstate network. Some of its basic purposes were to establish background levels and baseline water quality data including physical, chemical, and biological data, as well as seasonal and chronological variations. The monitoring program helps to establish cause and effect relationships between known point and nonpoint sources of pollution and the quality of the State's waters. The ambient monitoring program is vital in evaluating the effectiveness of the Department's pollution control program by assessing overall water quality before and after the implementation of pollution controls. This ultimately helps to update or redirect pollution control efforts.

In 1982, the Department evaluated the monitoring network and four goals were established for the new network to accomplish. The first was to better assess the effects of point source dischargers upon water quality; the second was to observe the impact of known nonpoint source problems over the long term. The third goal was to continue monitoring our major rivers due to their basic importance to the State. Finally, carefully selected, high quality (least impaired) streams would be monitored to provide long term chemical data by physiographic region for use in future water quality standards revisions. The "Ambient Water Quality Monitoring Network" (AWQMN) now consists of approximately 150 sites.

In 1994, the waters of the State not having monitoring data, or lacking data representative of the last 10 years, were identified. An extensive network of approximately 100 stations was established to monitor the water quality of these "unassessed" waters. Quarterly sampling began at these sites in May of 1994 and continued through October 1996. In October 1998, these stations were divided into four groups; each group would be sampled for two years on a bimonthly basis. These groups are collectively known as the "Roving Water Quality Monitoring Network" (RWQMN), which now consists of over 200 stations.

A third monitoring program by ADEQ consists of special or intensive surveys. These surveys are usually short term and objective specific. Most are conducted to more accurately determine designated use attainment or to develop the data necessary to develop TMDLs. Table III-1 is a list of the recent special monitoring projects. Table III-2 lists the common parameters analyzed from the samples collected from the AWQMN and RWQMN water quality monitoring sites and the special survey sites. Figure III-1 depicts the distribution of the ambient and roving stations and Figure III-2 depicts the special project monitoring waters.

Table III-1: Recent Special Projects (2002 to Present)

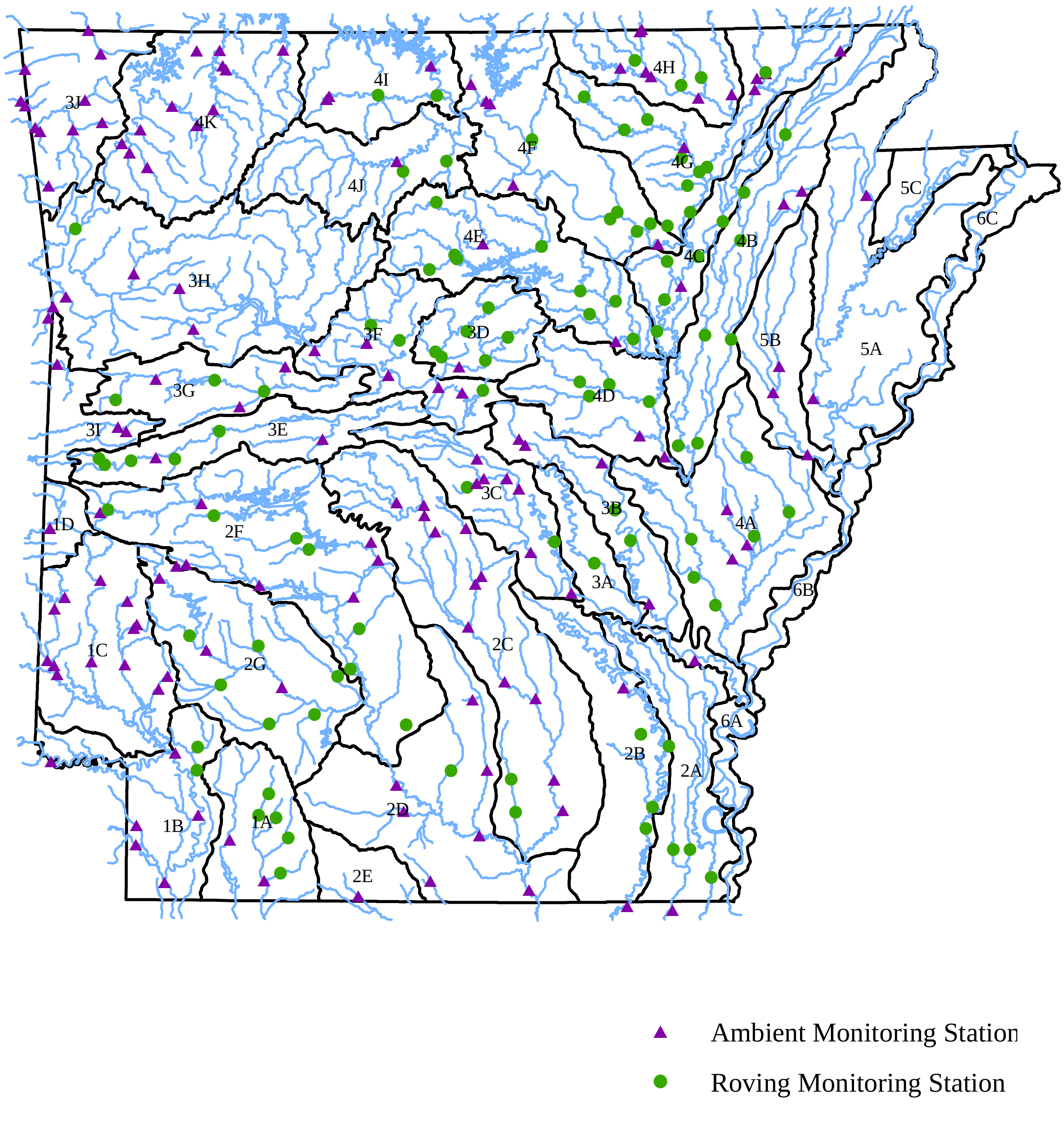
Name	Project Year(s)
Cove Creek	2006 to present
White River	2005
Middle Fork Saline River	2003 - 2005
Middle Fork Little Red River	2004 - 2006
Upper Saline River Watershed	1994-1995 & 2003-present

Copies of the final reports for these surveys and other documents produced by the Water Quality Planning Branch of the Water Division can be downloaded from the Department's website at www.adeq.state.ar.us/water/reports_data.htm.

Table III-2: Parameters Sampled at Water Quality Monitoring Stations

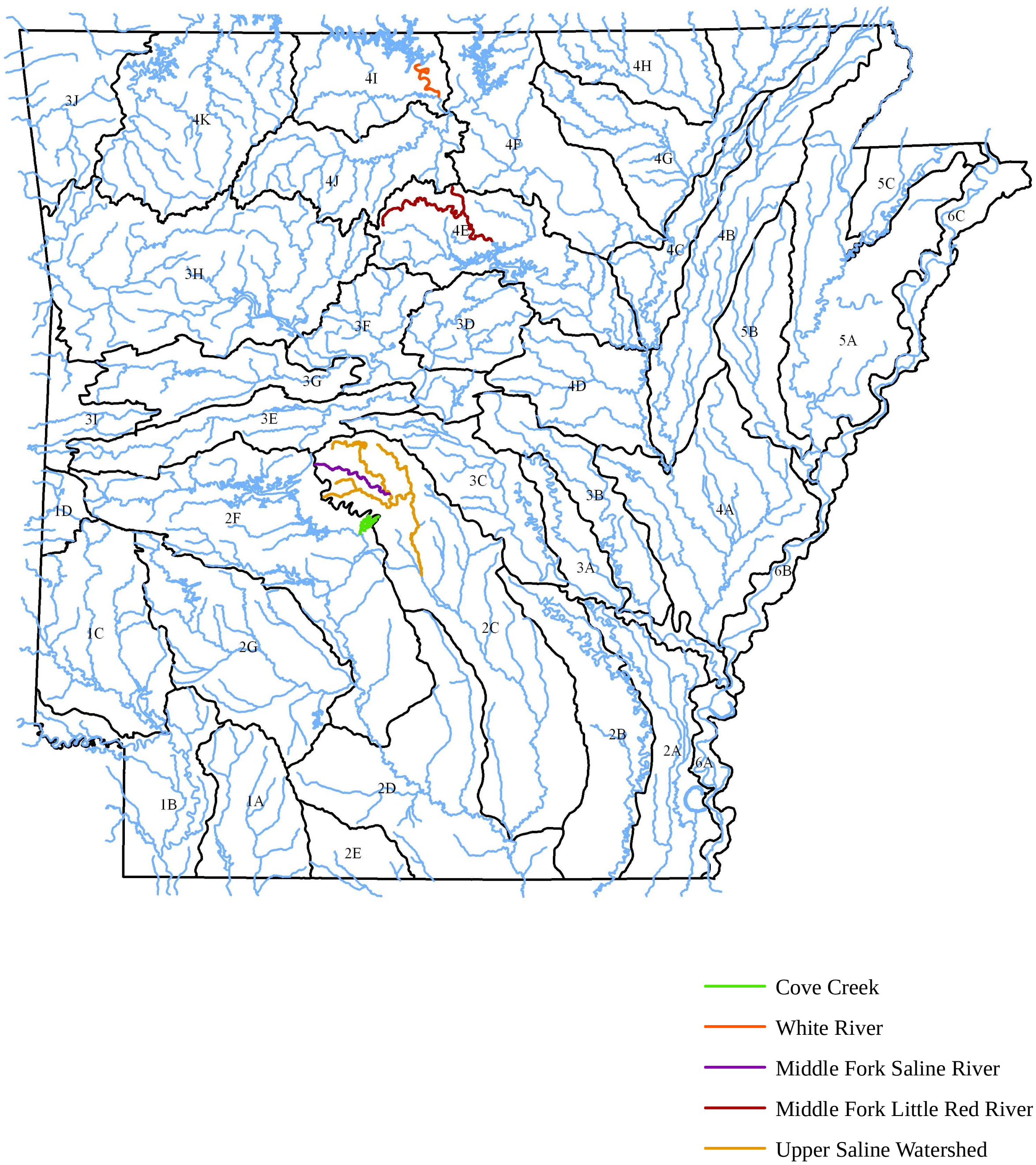
Water Temperature	Barium
pH	Cadmium
Turbidity	Chromium
Dissolved Oxygen	Copper
5-Day Biochemical Oxygen Demand	Calcium
Filterable Residue (TSS)	Lead
Non filtrable Residue (TDS)	Zinc
Chlorides	Iron
Sulfates	Potassium
Ammonia Nitrogen	Magnesium
Nitrite + Nitrate Nitrogen	Manganese
Total Phosphorus	Sodium
Ortho-Phosphorus	Nickel
Total Hardness	Cobalt
Boron	Vanadium
Beryllium	Selenium

Figure III-1: Water Quality Monitoring Stations



(Part III)

Figure III-2: Special Projects Monitoring Waters



(Part III)

Whole Effluent Toxicity Testing

The Department maintains a monitoring system to evaluate the environmental impacts of pollutants on aquatic life and human health. Monitoring programs include macroinvertebrate and fish community assessments; fish tissue analyses for contaminants, which may be harmful for human consumption; sediment testing for pesticides, toxic chemicals, and heavy metals; USEPA Ambient Toxicity Monitoring Program (results available at http://www.epa.gov/earth1r6/6wq/ecopro/watershd/monitrng/toxnet/index.htm); and bacteriological analyses. These techniques are used either as stand-alone methods or in conjunction with other biological or chemical analyses to monitor the biological health of waters throughout the State.

Macroinvertebrate and Fish Community Assessment

One of the best ways to monitor the health of a stream or other waterbody is to examine its biological inhabitants. The Department has conducted biological community monitoring throughout the State since the 1970s. Current macroinvertebrate collection methods are based on USEPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers (EPA 8-11-B-99-002).

Bacteriological Program

The bacteriological monitoring network has been substantially modified during the past several years. Because of the incompatibility of current network monitoring strategies and bacteriological sample holding times, a separate sampling scheme was developed. Technicians perform the sampling and analyses in the field to comply with the holding time of the methodology. Bacteriological analyses are performed at the Roving Water Quality Monitoring Network sites and those Ambient Water Quality Monitoring Network sites located in the same region as the current roving sites scheduled for sampling. The sites are sampled bimonthly as well as eight times during the primary contact recreation season to meet assessment criteria. In addition, bacteria samples are collected as part of most of the special survey projects.

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(Part III)

CHAPTER TWO PLAN FOR ACHIEVING COMPREHENSIVE ASSESSMENTS

In Arkansas, the "Water Quality Monitoring and Assessment Program, August 2006," has been very progressive and is one of the more intensive programs in the Nation (see Part III Chapter l). However, it is primarily limited to chemical monitoring of the water quality using long term, fixed, and specifically targeted stations. Objectives of the program have shifted with changes in types of water quality impacts, but the program has maintained its long-term, historical integrity. The benefits of the program include: 1) the ability to assess the use attainment status of the State's waters; 2) monitor long-term trends in least-disturbed areas; 3) monitor rapidly developing areas of the State; and 4) detect sudden changes in water quality of the State's waters. In addition, the program establishes background (historical) data for parameters that may not be used for assessments, but are necessary in other programmatic functions, e.g., background levels of heavy metals, ecoregion hardness, and suspended solids values for permit implementation procedures.

The current basic water quality networks in Arkansas are statewide in scope; consisting of a group of fixed stations which are sampled monthly and a group of roving stations that are sampled bimonthly. These networks are facilitated by either the regionally located field personnel or personnel from the central office. To convert the program, solely, to a probabilistic monitoring network would not only destroy the integrity of the program, but also severely disrupt personnel schedules and work activities. For the reasons discussed above, the basic design of the Arkansas monitoring network should not be changed.

The weakest part of Arkansas's assessment program is the reliance on chemical water quality data to assess the status of in stream aquatic life. While some chemical parameters may be more conclusive than others in determining the aquatic life use support, the direct measure of aquatic life communities is the most precise. The subtle impact of parameters such as minerals, turbidity, and nutrients is difficult to assess using only chemical concentrations. In contrast, other designated uses (e.g., drinking water supply, primary contact recreation, etc.) must rely on analyses of water samples directly.

To address this issue, site specific intensive surveys are conducted to better assess the biological integrity of streams. Data from the water quality monitoring networks is used to identify areas of potential aquatic life use impairment. Intensive survey work, including biological assessments, is performed on these designated areas.

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(Part III)

CHAPTER THREE ASSESSMENT METHODOLOGY

This assessment methodology considers USEPA's most current 305(b) reporting and 303(d) listing requirements and guidance. The criteria within this assessment methodology are utilized to make attainment decisions of the designated uses of a given waterbody or waterbody segment. Monitoring data will be assessed based upon the frequency, duration, and/or magnitude of water quality standard exceedances which may result in an impairment of a use. A one-time exceedance of water quality criteria due to anthropogenic disruptions may or may not cause a water quality impact, but allows the pursuit of enforcement actions.

The following assessment methodology will be used to determine waterbody use impairment from long-term and/or frequently occurring exceedances of the water quality criteria. In addition, short term, acute impacts can be identified by certain parameters.

Database

The primary data base for the 2008 Integrated Water Quality Monitoring and Assessment Report is from the ADEQ (Arkansas Department of Environmental Quality) Ambient and Roving Water Quality Monitoring Networks. The networks include the AWQMN (Ambient Water Quality Monitoring Network) stations that are sampled monthly and the RWQMN (Roving Water Quality Monitoring Network) stations that are sampled bi-monthly. The RWQMN Stations are divided into five groups geographically and are sampled for two years on a rotating schedule. Additional data, including but not limited to special projects, developed by ADEQ will be evaluated and used if the sampling frequency and duration represent actual annual ambient conditions. Data that represents actual annual ambient conditions is data collected on a random schedule and represents the various hydrological and climatological conditions that may occur on a yearly basis. The period of record from which most evaluations will be made for all the data used will be from July 1, 2002 through June 30, 2007. Metals and ammonia nitrogen toxicity evaluations will be based on a period of record from July 1, 2004 to June 30, 2007.

Pursuant to 40 CFR §130.7(b)(5), ADEQ will assemble and evaluate all existing and readily available water quality data and information. The assembled and evaluated water quality-related data shall be consistent with the requirements of 40 CFR §130.7(b)(5)(i-iv).

Agencies that routinely collect water quality data are solicited for data to aid ADEQ in its evaluation of the uses of the States waters. All data submitted to ADEQ will be considered. However, the data must represent actual annual ambient conditions, as described above, to be utilized in use attainment evaluations. All data used must be collected and analyzed under a quality-assurance/quality-control protocol equivalent to, or more stringent than that of ADEQ or the USGS. The data must also be analyzed pursuant to the rules outlined in the State Environmental Laboratory Certification Program Act (Act 876 of 1985 as amended). The period of record from which most evaluations will be made using data from outside sources will be the same as described above.

Assessment

ADEQ must take into consideration the possibility of naturally occurring disruptions that may cause exceedances of a standard, but which should not result in the impairment of a designated use. Exceedances resulting from *Naturally Occurring Excursions* (NOE), or determined to be

Natural Background conditions, as defined in Reg. 2.106, will not be assessed as impaired, provided supporting rationale is included.

Data collection generally follows a monthly or bimonthly sampling regime, thus producing 24 to 60 data points during a five-year period. Attainment decisions will be based on the criteria listed with this assessment methodology from the samples collected from the AWQMN or RWQMN. In addition, other data will be used to make use attainment decisions if the data meets QA/QC requirements and the requirements sent forth by this assessment methodology. The data will be evaluated on a case by case basis considering such things as period of record, number of samples, and seasonality in relationship to designated uses.

For the assessment of waterbodies where no new data has been generated since the previous assessment, the previous assessment decisions will be carried forward. However, if a significant change in the water quality regulations or the assessment methodology has occurred since the previous assessment, and those changes would affect the previous assessment decisions, then the waterbody will be re-assessed, provided an adequate data base exists within the period of record to make a scientifically defensible assessment decision.

The percent exceedance shown in the Assessment Criteria tables are calculated using the total number of samples collected. The number of data points exceeding the criteria which are necessary for an assessment decision will be calculated and rounded up to the nearest whole number; e.g. 25% of 38 data points = 9.5, therefore 10 exceedances equal 25%.

An evaluated assessment of non-attainment can be made for contiguous stream segments to monitored waters if there is reason to believe that the segments are similar with respect to the potential cause and magnitude of impairment. However, an evaluation of non-attainment of a designated use can not be made for contiguous stream segments to monitored waters when the source or the origin of the source of the impairment is unknown, and/or when the magnitude or frequency of the impairment is such that downstream segments may not be affected. In such cases, the contiguous stream segments will remain unassessed.

An evaluated assessment of attainment of designated uses, in the absence of data, can be made for contiguous stream segments to monitored waters if there is reason to believe that the segments are similar with respect to the watershed characteristics and watershed conditions. Otherwise, the contiguous stream segments will remain unassessed.

For lakes and reservoirs, assessments will be made from long-term trend data, collected initially in 1989 and continued on a five-year cycle, or seasonally distributed data. Seasonally distributed data is defined as data that has been collected to analyze water quality variations during different annual lake stages, including fully mixed, and partial and complete stratification.

<u>Narrative Criteria</u> - Waters will be assessed as “non-support” when violation of any narrative water quality standard has been verified by ADEQ. Waters will be assessed as “non-support” if any associated numeric standard of a narrative criterion is violated pursuant to this assessment methodology.

<u>Numeric Criteria</u> - All waters of the state with qualifying data will be assessed as either “support” or “non-support” based on the assessment criteria contained within this document.

Listing of Waterbodies

The States' waterbodies are assessed based mainly on the RF3 stream reach classification. However, some stream reaches from the National Hydrological Dataset (NHD) are used to supplement the RF3 database coverage. Individual stream reaches that are assessed as not attaining their respective designated use(s) will be included on the 303(d) list. These reaches will be categorized based on the confidence level, quality assurance, quantity of the data used to make the assessment, and the following USEPA derived guidance.

Listing Categories

Arkansas's 2008 List of Water Quality Limited Waterbodies has been formatted to reflect the most current guidance issued by the US Environmental Protection Agency (USEPA). As part of that guidance, USEPA suggests placing waterbody segments into the six main categories. Waterbodies in Category 5 are placed in subcategories established by ADEQ for planning purposes.

1 = Attaining all designated uses;

2 = Attaining some designated uses, but there is insufficient data to determine if other uses are being attained;

3 = Insufficient data to determine if any designated use is attained;

4 = Impaired for one or more designated uses but does not require the development of a TMDL because:

   a. A TMDL has been completed for the listed parameter(s);

5 = The waterbody may be impaired, or one or more designated uses may not be attained.Waterbodies in Category 5 are placed in one of the following subcategories:

   a. Truly impaired; develop a TMDL or other corrective action(s) for the listed parameter.
   b. Waters currently not attaining standards, but may be de-listed with future revisions to Regulation No. 2, the state water quality standards;
   c. Waters in which the data is questionable because of QA/QC procedures and which require confirmation before a TMDL is scheduled;
   d. Waters which need data verification to confirm use impairment (additional sampling, biological assessment) before a TMDL is scheduled;
   e. Waters which are impaired by point source discharges and future permits restrictions are expected to correct the problem;
   f. These are waters that are not currently meeting a water quality standard. However, "the basis for not meeting an applicable water quality standard is not caused by a pollutant, but is attributed to other types of pollution" (EPA, 2005).
   g. Waterbodies added to ADEQ's list of Impaired Waterbodies by EPA.

Designated Uses

The following parameters are most often associated with impacts of designated uses:

Designated Use	Parameters
Aquatic Life Use	D.O., pH, temp., turbidity/TSS, toxics, ammonia or any non toxic compound which alters the aquatic life community structure beyond that explained in Reg. 2.405.
Domestic Water Supply	Compounds which are not easily removed by drinking water treatment facilities; compounds with established secondary MCL's, e.g., Cl, SO_4, TDS, NO_3
Primary and Secondary Contact	*Escherichia coli,* fecal coliform
Agriculture and/or Industrial Water Supply	Compounds which interfere with industrial uses such as cooling water or the water used in certain manufacturing processes; or waters unsuitable for livestock watering or crop irrigation; most often includes Cl, SO_4, TDS

Antidegradation

In compliance with the antidegradation policy, a Tier 3 waterbody (e.g. Extraordinary Resource Waters, Ecologically Sensitive Waters, Natural and Scenic Waterways) will be listed as "non-support" if the water quality that existed at the time of designation has declined. For all other waters (Tier 1 and Tier 2) the listing requirements discussed above will apply.

Assessment Criteria

Following are ecoregion or stream segment specific assessment criteria which were used to list all assessed waterbodies as either supporting or not supporting the designated uses. These assessment criteria were developed using Arkansas's Water Quality Standards and, in part, from USEPA's guidance for determining support or non-support of a waterbody.

Key to the footnotes in the assessment criteria tables is as follows:

1 - Except for site specific standards approved in water quality standards

2 - Criteria based on 90th percentile of ecoregion values

3 - Refers to the number of data points instead of a percentage (i.e. greater than one value exceeding criteria = non-support).

A waterbody will be assessed as "non-support" if any of its designated uses are determined to be impaired by a water quality parameter which exceeds the frequency as outlined in the following assessment criteria tables:

GENERAL STANDARDS

Table III -3: Assessment Criteria Tables

ASSESSMENT CRITERIA FOR OZARK HIGHLANDS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	29 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	>10%	>10%
10-100 MI	6	5	< =10%	< =10%	>10%	>10%
> 100 MI	6	6	< =10%	< =10%	>10%	>10%
Trout Waters	6	6	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	17 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR BOSTON MOUNTAINS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	31 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	>10%	>10%
> 10 MI	6	6	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	19 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR ARKANSAS RIVER VALLEY ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	31 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	>10%	>10%
10-150 MI	5	3	< =10%	< =10%	>10%	>10%
151-400 MI	5	4	< =10%	< =10%	>10%	>10%
>400 MI	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	40 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR OUACHITA MOUNTAINS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	>10%	>10%
>10 MI	6	6	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	18 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR GULF COASTAL ECOREGION (typical streams)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	>10%	>10%
10-500 MI	5	3	< =10%	< =10%	>10%	>10%
>500 MI	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR GULF COASTAL ECOREGION (spring water influenced)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERSHEDS	6	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR DELTA ECOREGION (least altered)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	>10%	>10%
10-100 MI	5	3	< =10%	< =10%	>10%	>10%
>100 MI	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	45 NTU		< = 25%		>25%	
Storm Flow[2]	84 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR DELTA ECOREGION (channel-altered)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	>10%	>10%
10-100 MI	5	3	< =10%	< =10%	>10%	>10%
>100 MI	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	75 NTU		< = 25%		>25%	
Storm Flow[2]	250 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR WHITE RIVER (MAIN STEM)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]						
DAM #1 TO MOUTH	32 C		< =10%		>10%	
OZARK HIGHLANDS	29 C		< = 10%		>10%	
TROUT WATERS	20 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
DELTA	5	5	< =10%	< =10%	>10%	>10%
OZARK HIGHLANDS	6	6	< =10%	< =10%	>10%	>10%
TROUT WATERS	6	6	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
Mouth to Dam #3	20/60/430		< =10%		>10%	
DAM #3 TO MO. LINE[1]	20/20/180		< =10%		>10%	
MO. LINE TO HEADWATERS[1]	20/20/160		< =10%		>10%	
TURBIDITY						
Primary Values Delta	45 NTU		< = 25%		>25%	
Storm Flow Delta[2]	84 NTU		< = 20%		>20%	
Primary Ozark Highlands	10 NTU		< = 25%		>25%	
Storm Flow Ozark Highlands[2]	17 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR ST. FRANCIS RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
CL/SO_4/TDS[1]						
MOUTH TO 36^0 N. LAT.[1]	10/30/330		< =10%		>10%	
36^0 N. LAT. TO 36^0 30'N LAT.[1]	10/20/180		< =10%		>10%	
TURBIDITY						
Primary Values	75 NTU		< = 25%		>25%	
Storm Flow[2]	100 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE ARKANSAS RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
CL/SO_4/TDS[1]						
MOUTH TO L&D #7[1]	250/100/500		< =10%		>10%	
L&D #7 TO L&D #10[1]	250/100/500		< =10%		>10%	
L&D #10 TO OK LINE[1]	250/120/500		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	52 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE OUACHITA RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]						
L. MISSOURI TO S.LINE	32 C		< = 10%		>10%	
ABOVE L. MISSOURI	30 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
LA LINE TO CAMDEN[1]	160/40/350		< =10%		>10%	
CAMDEN TO CARPENTER DAM[1]	50/40/150		< =10%		>10%	
CARPENTER DAM TO HEADWATERS[1]	10/10/100		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE RED RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
OK LINE TO CONFLUENCE WITH LITTLE RIVER[1]	250/200/850		< =10%		>10%	
LITTLE RIVER TO LA LINE[1]	250/200/500		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	150 NTU		< = 20%		>20%	

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ASSESSMENT CRITERIA FOR THE MISSISSIPPI RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	>10%	>10%
pH	6 to 9 standard pH units		< =10%		>10%	
CL/SO_4/TDS[1]						
LA LINE TO AR RIVER[1]	60/150/425		< =10%		>10%	
AR RIVER TO MO LINE[1]	60/175/450		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	75 NTU		< = 20%		>20%	

SPECIFIC STANDARDS

Domestic Water Supply

For assessment of ambient waters, the domestic water supply designated use will be evaluated using nitrate nitrogen, chloride, sulfate, and total dissolved solids in accordance with the Federal Safe Drinking Water Act. If greater than 10% of the total samples for the period of record exceed the applicable criteria, the waterbody will be listed as impaired.

STATEWIDE DRINKING WATER ASSESSMENT CRITERIA

PARAMETER	STANDARD	SUPPORT	NON-SUPPORT
NO_3-N (D.W.)	10 mg/L	< =10%	>10%
CL/SO_4/TDS[1]	250/250/500	< =10%	>10%

Reg. 2.503 - Turbidity

Turbidity, Reg. 2.503, will be evaluated for both base flow (primary values) and storm-flow (storm-flow values) conditions. If a waterbody is not meeting either of these conditions, it will be listed as not supporting turbidity water quality criteria.

Primary values represent the critical season when rainfall is infrequent and is applied to samples collected between June 1 and October 31. If four or more samples, or more than 25% of the total samples, whichever is greater, collected between June 1 and October 31 for the period of record exceed the primary values criterion, the waterbody will be listed as impaired.

Storm-flow assessment takes into account samples collected throughout the year. If more than 20% of the total samples collected from the AWQMN sites, not to be less than 24, exceed the Storm-Flow values, the waterbody will be evaluated as being impaired for turbidity. For data collected from sites other than the AWQMN, if five or more samples, or more that 20% of the total samples, whichever is greater, exceed the Storm-Flow criterion, the waterbody will be listed as impaired.

Reg. 2.507 - Pathogens

For assessment of ambient waters, primary and secondary contact recreation will be evaluated using *Escherichia coli* and fecal coliform bacteria criteria as outlined in Reg. 2.507. The period of record for the data will be from July 1, 2002 to June 30, 2007. For bacteria, a minimum of eight samples will be required to make an evaluation of non-attainment. However, a minimum of six samples, all of which must meet the criteria, can be used to make an evaluation of attainment.

The geometric mean will be calculated on a minimum of five samples equally spaced over a 30-day period during either the primary contact recreation season and/or the secondary contact recreation season and should not exceed the criteria set forth in Reg 2.507.

In either case, if either the single sample criterion or the geometric mean is exceeded for the period of record, the waterbody will be listed as impaired. Data sets of less than those described above will be evaluated if they represent actual annual ambient conditions.

Statewide Bacteria Assessment Criteria

Escherichia coli		STANDARD	SUPPORT	NON-SUPPORT
PRIM. CONTACT	ERW, ESW, and NSW Waters Lakes, Reservoirs	298 col/100 ml (May-Sept)	< = 25%	>25%
		GM 126 col/100 ml	< = standard	> standard
	All other waters	410 col/100 ml (May-Sept)	< = 25%	>25%
		GM 126 col/100 ml	< = standard	> standard
SEC. CONTACT	ERW, ESW, and NSW Waters Lakes, Reservoirs	1490 col/100 ml(anytime)	< = 25%	>25%
		GM 630 col/100 ml	< = standard	> standard
	All other waters	2050 col/100 ml(anytime)	< = 25%	>25%
		GM 630 col/100 ml	< = standard	> standard
Fecal Coliform		STANDARD	SUPPORT	NON-SUPPORT
PRIMARY CONTACT All Waters including ERW, ESW, NSW, Lakes, and Reservoirs		400 col/100 ml (May-Sept)	< = 25%	>25%
		GM 200 col/100 ml	< = standard	> standard
SECONDARY CONTACT All Waters including ERW, ESW, NSW, Lakes, and Reservoirs		2000 col/100 ml(anytime)	< = 25%	>25%
		GM 1000 col/100 ml	< = standard	> standard

ERW – Extraordinary Resource Waters
NSW – Natural and Scenic Waterways
ESW – Ecologically Sensitive Waterbody

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Reg. 2.508 - Metals

In accordance with Reg. 2.508, metals toxicity will be evaluated based on in stream hardness values at the time of sample collection. If the ambient hardness value is less than 25 mg/L, then a hardness value of 25 mg/L will be used to calculate metals toxicity. If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired for the metal assessed.

Statewide Metals Assessment Criteria

	Acute[3]	Chronic[3]
Support	< =1	< =1
Non-Support	>1	>1

Reg. 2.511 - Minerals

Mineral quality will be evaluated as follows: assessments for waterbodies with site specific criteria are made according to the specific values listed in Reg. 2.511. For those waterbodies without site specific criteria, and those stream segments which receive waste water effluent, the criteria of 250 mg/l of chlorides, 250 mg/l of sulfates, and 500 mg/l of total dissolved solids in Reg. 2.511 will apply. In either case, if greater than 10% of the total samples for the period of record exceed the applicable criteria, the waterbody will be included on the 303(d) list as being impaired for the mineral assessed.

Statewide Minerals Assessment Criteria

Parameter	Standard	Support	Non-Support
Site Specific Standards	See Reg. 2.511	< =10%	>10%
CL/SO_4/TDS[1]	250/250/500	< =10%	>10%

The ecoregion values described in Reg. 2.511 are used to determine whether there is a 'significant modification of the water quality.' These values are not intended to be used to indicate an impairment of a designated use. Any discharge which results in in stream chlorides, sulfates, and or total dissolved solids concentrations greater than the calculated ecoregion reference stream values list below is considered to be a significant modification of the water quality and should be considered as candidates for a modification in accordance with Reg. 2.306.

Calculated Ecoregion Reference Stream Values (mg/l)

Ecoregion	Chlorides	Sulfates	TDS
Ozark Highlands	17.3	22.7	250
Boston Mountains	17.3	15	95.3
Arkansas River Valley	15	17.3	112.3
Ouachita Mountains	15	20	142
Gulf Coastal Plains	18.7	41.3	138
Delta	48	37.3	411.3

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Reg. 2.512 - Ammonia

Acute total ammonia nitrogen will be evaluated using Reg. 2.512(A) based on in stream pH at the time of sample collection. If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired.

Chronic total ammonia nitrogen will be evaluated using Reg. 2.512(B) based on in stream temperature and pH at the time of sample collection. If more than 10% of the total samples exceed the criteria in Reg. 2.512(B) the segment will be assessed as not supporting aquatic life.

For Reg. 2.512(C), the highest four day average within a 30-day period should not exceed 2.5 times the chronic values listed in Reg. 2.512(B). If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired.

Statewide Total Ammonia Nitrogen Assessment Criteria

	ACUTE[3]	CHRONIC	4-DAY AVERAGE[3]
Support	< =1 in 3 years	< =10%	< =1 in 3 years
Non-Support	>1 in 3 years	>10%	>1 in 3 years

Fish Consumption

Waters will be listed as “non-support” for fish consumption if a primary segment of the fish community (e.g., all predators or all Largemouth bass) is recommended for non-consumption by any user group (e.g., general population or high risk groups). However, if a consumption restriction is recommended, e.g., no more than two meals per month or no consumption of fish over 15-inches, these waters will not be listed as “non-support”.

Statewide Fish Consumption Assessment Criteria

Support	No restriction or limited consumption
Non-Support	No consumption for any user group

CHAPTER FOUR RIVERS AND STREAMS WATER QUALITY ASSESSMENT

Chemical Parameters

The following tables summarize the use support of the State's river and stream waterbodies. Miles not supporting are a tabulation of Category 4 and Category 5 303(d) listings. A detailed listing of each segment-specific waterbody, use assessment, and other segment specific data is located Appendix A.

Table III-4: Designated Use Support in Arkansas

Degree of Use Support	Assessment Basis (miles)		Assessed Total (miles)
	Evaluated	Monitored	
Supporting all assessed uses	4882.0	881.2	5763.2
Not supporting a use	3466.9	619.6	4086.5
Total Waters Assessed	8348.9	1500.8	9849.7

Table III-5: Designated Use Support of Assessed Waters by Use Type

Use Type	Support (miles)	Non-Support (miles)
Fish consumption	9486.4	363.3
Aquatic life	7409.8	2439.9
Primary contact	9284.9	564.8
Secondary contact	9842.7	7.0
Domestic Water Supply	9401.4	448.3
Agri & Industrial Water Supply	8882.0	967.7

Table III-6: Total Sizes of Waters Listed Not Supporting Uses by Various Source Categories

Source Categories	Stream Segments	Stream Miles
Agriculture	59	1372.0
Surface erosion	39	460.0
Resource extraction	30	211.0
Industrial point sources	18	194.0
Municipal point sources	15	166.0
Hydropower	3	9.2
Unknown	206	2826.0

Table III-7: Total Sizes of Waters Listed Not Supporting Uses by Various Cause Categories

Cause Categories	**Stream Segments**	**Stream Miles**
Ammonia	2	12.0
Nitrogen	47	624.8
Phosphorus	7	59.8
Chlorides	33	691.7
Sulfates	32	511.0
Total Dissolved Solids	56	1021.7
Siltation/Turbidity	67	1156.3
Pathogen Indicators	44	638.8
Aluminum	1	20.3
Beryllium	26	454.0
Cadmium	1	2.5
Copper	27	417.7
Lead	35	618.1
Zinc	47	744.9
Mercury	22	319.0
Priority Organics	1	44.8
Organic Enrichment/DO	64	1308.0
pH	15	193.5
Temperature	10	86.1

Biological Parameters

Aquatic life use assessment is a tool used to better characterize the attainment of designated uses of waterbodies based on macroinvertebrate and fish community structures. Short-term water quality impairments either from point and/or nonpoint source inputs or from short-term seasonal and/or storm events may not be detected using water quality data from grab samples. Individual short-term events most likely do not have a significant effect on the biological communities within a stream; however, these communities may be affected by frequent short-term events that limit full recovery between episodes.

Between July 1, 2002, and June 30, 2007, more than 120 aquatic life samples were collected for the purpose of watershed assessment surveys or the establishment of ecoregion based indices of biotic integrity, as well as use support determination (Table III-8). Some of these samples were part of the special project surveys listed in Part III, Chapter 1. The data is accessible on line: www.adeq.state.ar.us/compsvs/webmaster/databases.htm.

Table III-8: Recent Aquatic Life Data Collections

Ecoregion Macroinvertebrate Metrics Development Re-sampling of Original Ecoregion Reference Streams						
Stream Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Year Collected**	**Fish Community Year Collected**
East Fork Cadron Creek	11110205	-005	3D	Arkansas River Valley	2002	
North Fork Cadron Creek	11110205	-013	3D	Arkansas River Valley	2002	2005
West Point Remove Creek	11110203	-016	3F	Arkansas River Valley	2002	
East Point Remove Creek	11110203	-014	3F	Arkansas River Valley	2002	
Petit Jean River	11110204	-003	3G	Arkansas River Valley	2002	
Petit Jean River	11110204	-011	3G	Arkansas River Valley	2002	2005
Dutch Creek	11110204	-015	3G	Arkansas River Valley	2002	
Short Mountain Creek	11110202	-043	3H	Arkansas River Valley	2002	
Big Shoal Creek	11110202	-045	3H	Arkansas River Valley	2002	
Poteau River	11110105	-031	3I	Arkansas River Valley	2002	
Cossatot River	11140109	-018	1C	Ouachita Mountains	2002	
Rolling Fork	11140109	-024	1C	Ouachita Mountains	2002	
Rolling Fork	11140109	-024	1C	Ouachita Mountains	2002	
Mountain Fork	11140108	-016	1D	Ouachita Mountains	2002	
South Fork Saline River	08040102	-028	2C	Ouachita Mountains	2002	
Prairie Creek	08040101	-048	2F	Ouachita Mountains	2002	
Caddo River	08040102	-019	2F	Ouachita Mountains	2002	
South Fork Ouachita River	08040101	-043	2F	Ouachita Mountains	2002	
Little Missouri River	08040103	-022	2G	Ouachita Mountains	2002	
Black Fork Fourche La Fave R.	11110206	-009	3E	Ouachita Mountains	2002	
Bois D' Arc Creek	11140201	-008	1B	Gulf Coastal Plains	2003	2003
Derrieusseaux Creek	08040203	-002	2C	Gulf Coastal Plains	2003	2003
Big Creek	08040204	-005	2C	Gulf Coastal Plains	2003	2003
Hudgins Creek	08040204	-003	2C	Gulf Coastal Plains	2003	2003
L'Aigle Creek	08040204	-007	2C	Gulf Coastal Plains	2003	2003
Moro Creek	08040201	-001	2D	Gulf Coastal Plains	2003	2003
Whitewater Creek	08040201	-xxx	2D	Gulf Coastal Plains	2003	
Flat Creek	08040201	-706	2D	Gulf Coastal Plains	2003	
Jug Creek	08040201	-901	2D	Gulf Coastal Plains	2003	
Bayou Freeo	08040102	-028	2F	Gulf Coastal Plains	2003	2003
East Fork Tulip Creek	08040102	-901	2F	Gulf Coastal Plains	2003	2003
Terre Rouge Creek	08040103	-031	2G	Gulf Coastal Plains	2003	
Bayou Macon	08050002	-003	2A	Delta	2003	
Boat Gunwale Slash	08020303	-914	4A	Delta	2003	
Big Creek	08020304	-009	4A	Delta	2003	
Bayou DeView	08020302	-002	4B	Delta	2003	
Village Creek	11010013	-006	4C	Delta	2003	
Whiteman Creek	08020203	-xxx	5A	Delta	2003	
L'Anguille River	08020205	-004	5B	Delta	2003	

Ecoregion Macroinvertebrate Metrics Development Re-sampling of Original Ecoregion Reference Streams						
Stream Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Year Collected**	**Fish Community Year Collected**
Second Creek	08020205	-008	5B	Delta	2003	
Cockle Burr Slough	08020204	-xxx	5C	Delta	2003	
Board Camp Creek	08040101	-036t	2F	Ouachita Mountains		2004
Little Missouri River	08040103	-022	2G	Ouachita Mountains		2004
South Fork Ouachita River	08040101	-043	2F	Ouachita Mountains		2004
Cossatot River	11140109	-018	1C	Ouachita Mountains		2004
Caddo River	08040102	-016	2F	Ouachita Mountains		2004
Saline River	08040203	-010	2C	Ouachita Mountains		2004
Mill Creek	11110205	xxx	3D	Arkansas River Valley		2005
North Cadron Creek	11110205	-015	3D	Arkansas River Valley		2005
Petit Jean Creek	11110204	-011	3G	Arkansas River Valley		2005

Middle Fork Saline River Physical, Chemical, and Biological Community Assessment (*2003, 2004, 2005)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
MFS02	08040203	-019	2C	Ouachita Mountains	X	X
MFS03	08040203	-019	2C	Ouachita Mountains	X	X
MFS05	08040203	-019	2C	Ouachita Mountains	X	X
MFS04B	08040203	-019	2C	Ouachita Mountains	X	X
Mill Creek	08040203	-019	2C	Ouachita Mountains	X	X

Upper Saline Watershed Nutrient Criteria Development and MBMI Pilot Project (2007)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
AF-1 (Alum Fork)	8040203	-014	2C	Ouachita Mountains	X	
AFS0001 (Alum Fork)	8040203	-014	2C	Ouachita Mountains	X	
Alum Fork @ Hwy 229	8040203	-012	2C	Ouachita Mountains	X	
Alum Fork at Sulphur Spgs Rd.	8040203	-014	2C	Ouachita Mountains	X	
Alum Fork near Alum View Rd	8040203	-014	2C	Ouachita Mountains	X	
Bread Creek	8040203	-223	2C	Ouachita Mountains	X	
Cedar Creek @ Hwy 5	8040203	-021	2C	Ouachita Mountains	X	
LAF01 (Little Alum Fork)	8040203	-261	2C	Ouachita Mountains	X	
Lee Creek @ Unity	8040203	-252	2C	Ouachita Mountains	X	
MFS01 (Middle Fork Saline)	8040203	-019	2C	Ouachita Mountains	X	
MFS06 (Middle Fork Saine)	8040203	-019	2C	Ouachita Mountains	X	
NF-2	8040203	-011	2C	Ouachita Mountains	X	
NF-4	8040203	-011	2C	Ouachita Mountains	X	
NF-5 (North Fork Saline)	8040203	-011	2C	Ouachita Mountains	X	

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Upper Saline Watershed Nutrient Criteria Development and MBMI Pilot Project (2007)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
NF6-A (North Fork Saline)	8040203	-011	2C	Ouachita Mountains	X	
NF6-B (North Fork Saline)	8040203	-011	2C	Ouachita Mountains	X	
NFS01 (North Fork Saline)	8040203	-011	2C	Ouachita Mountains	X	
SFS02 (South Fork Saline)	8040203	-020	2C	Ouachita Mountains	X	
South Fork Saline @ Hwy 5	8040203	-020	2C	Ouachita Mountains	X	
Stillhouse Creek	8040203	-547	2C	Ouachita Mountains	X	
Ten Mile Creek @ Hwy 70	8040203	-717	2C	Ouachita Mountains	X	
Williams Creek @ Hwy 5	8040203	-285	2C	Ouachita Mountains	X	

Middle Fork Little Red River Physical, Chemical, and Biological Community Assessment (2005)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
WHI0180	11010014	-030	4E	Boston Mountains	X	
WHI0181	11010014	-030	4E	Boston Mountains	X	X
UWMFK01	11010014	-030	4E	Boston Mountains	X	
WHI0182	11010014	-030t	4E	Boston Mountains	X	
WHI0186	11010014	-030t	4E	Boston Mountains	X	
WHI0177	11010014	-030	4E	Boston Mountains	X	X
WHI0178	11010014	-030	4E	Boston Mountains	X	X
WHI0153	11010014	-029	4E	Boston Mountains	X	
WHI0043	11010014	-028	4E	Boston Mountains	X	X
WHI0179	11010014	-028t	4E	Boston Mountains	X	X

White River *Didymosphenia geminata* Assessment (2005)						
Site Locations	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
White Hole	11010003	-002	4I	Ozark Highlands	X	
Cotter	11010003	-002	4I	Ozark Highlands	X	
Newland's Pool	11010003	-002	4I	Ozark Highlands	X	
Wildcat Shoals	11010003	-002	4I	Ozark Highlands	X	

Cove Creek Physical, Chemical, and Biological Community Assessment (2007)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
OUA0101	8040102	-500	2F	Ouachita Mountains	X	
OUA0104	8040102	-500	2F	Ouachita Mountains	X	
OUA0103	8040102	-147	2F	Ouachita Mountains	X	

Cove Creek Physical, Chemical, and Biological Community Assessment (2007)						
Site Name	**H.U.C.**	**Reach**	**Planning Segment**	**Ecoregion**	**Macro-Invertebrates Collected**	**Fish Community Collected**
OUA0100	8040102	-143	2F	Ouachita Mountains	X	
OUA0159	8040102	-142	2F	Ouachita Mountains	X	
OUA0171D	8040102	-505	2F	Ouachita Mountains	X	
OUA0171C	8040102	-001	2F	Ouachita Mountains	X	
OUA0171B	8040102	-501	2F	Ouachita Mountains	X	

Percent comparability evaluation techniques were used in the evaluation of the macroinvertebrate and fish communities. Two types of community comparisons were made: upstream-downstream community comparison and least disturbed reference stream comparison.

The macroinvertebrate communities were collected and evaluated following the Department's Rapid Bioassessment Protocols.

Fish communities were analyzed following USEPA's "Technical Support Manual: Waterbody Surveys and Assessments for Conducting Use Attainability Analysis", and direct comparisons were made with ecoregion fish community data outlined in the Department's "Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas's Ecoregions, 1987."

CHAPTER FIVE LAKES WATER QUALITY ASSESSMENT

Background

Although selected lakes have had intensive, long-term assessments, the water quality data from the majority of Arkansas's lakes is sparse. Some have only specific purpose data, e.g., bacteria sampling from swimming areas. A few lakes have been investigated as a short term project when a specific or potential problem was identified. Such studies were associated with the Clean Lakes Section of the Water Quality Act, or municipal water supply reservoirs with treatment problems. In contrast, the Corps' lakes of the Little Rock District have a relatively large amount of multi-parameter and multi-site water quality data. Additionally, DeGray Reservoir probably has the most extensive water quality database of any reservoir in this region of the country; the data extends from pre-impoundment to the present.

Arkansas currently has identified 78 significant publicly-owned lakes ranging in size from 60 to over 45,000 acres; currently totaling 357,896 acres. The lakes are categorized into five "Types" (ADEQ 2004) by ecoregion, primary construction purpose, and certain morphometric features such as size and average depth. In 2007, construction was completed on the Lake Fort Smith dam in Crawford County in northwest Arkansas which combined Lake Shepherd Springs and the original Lake Fort Smith. The new Lake Fort Smith is 1390 surface acres, 422 surface acres larger than the original two lakes combined.

Table III-9 is a list of Arkansas's significant publicly-owned lakes and selected characteristics of each. Figure III-3 is a map depicting the locations of each lake. The number on the map corresponds to the lake number in Table III-9.

Lake Water Quality Assessments

Since 1989, four lake water quality assessments have been completed on Arkansas's significant publicly-owned lakes. Water quality samples, metals, pesticides, fecal coliform and/or *Escherichia coli* bacteria, as well as dissolved oxygen and temperature profiles were collected from most of these lakes between mid July and the end of August in 1989, 1994, 1999, and 2004. Sediment samples were collected in 1994 and plankton samples were collected in 1999 and 2004.

In 2005, the Department initiated a project on Beaver Lake in northwest Arkansas. The goals of the project are to: 1) develop sound, scientifically based numeric water quality criteria to protect the designated uses of Beaver Reservoir by using a calibrated hydrodynamics and water quality model, developed by the USGS, to run various sediment and nutrient-loading scenarios to examine algal response in the reservoir and; 2) develop a process to continue developing water quality criteria for the State's Type A lakes. These are the large, Corps of Engineers reservoirs primarily used for flood control, water supply, and recreation.

Table III -9: Significant Publicly-Owned Lakes

No	Lake	County	Acres	Avg. Depth	Water Shed[1]	W/A[2]	Eco Region[3]	Purpose[4]	Type
1	WINONA	SALINE	1240	30	44.4	22.9	OM	W	A
2	DIERKS	HOWARD	1360	22	114.0	53.6	OM	F	A
3	GILLHAM	HOWARD	1370	21	271.0	126.6	OM	F	A
4	DEQUEEN	SEVIER	1680	21	169.0	64.4	OM	F	A
5	CATHERINE	HOT SPRING	1940	18	1516.0	500.1	OM	H	A
6	GREESON	PIKE	7200	39	237.0	21.1	OM	H	A
7	HAMILTON	GARLAND	7300	26	1441.0	126.3	OM	H	A
8	MAUMELLE	PULASKI	8900	23	137.0	9.9	OM	W	A
9	DEGRAY	CLARK	13200	49	453.0	22.0	OM	H	A
10	NORFORK	BAXTER	22000	57	1806.0	52.5	OH	H	A
11	BEAVER	BENTON	28200	58	1186.0	26.9	OH	H	A
12	GREERS FERRY	CLEBURNE	31500	60	1153.0	23.4	BM	H	A
13	OUACHITA	GARLAND	40100	51	1105.0	17.6	OM	H	A
14	BULL SHOALS	MARION	45440	67	6036.0	85.0	OH	H	A
15	CRYSTAL	BENTON	60	12	4.5	48.0	OH	A	B
16	SHORES	FRANKLIN	82	10	26.0	202.9	BM	R	B
17	SPRING	YELL	82	23	10.5	82.0	AV	R	B
18	HORSEHEAD	JOHNSON	100	16	17.3	110.7	BM	R	B
19	WEDINGTON	WASHINGTON	102	16	3.0	18.8	OH	R	B
20	COVE	LOGAN	160	10	8.5	34.0	AV	R	B
21	ELMDALE	WASHINGTON	180	8	6.0	21.3	OH	A	B
22	FAYETTEVILLE	WASHINGTON	196	15	6.0	19.6	OH	R	B
23	BOBB KIDD	WASHINGTON	200	13	4.0	12.8	OH	A	B
24	WILHELMINA	POLK	200	10	13.5	43.2	OM	A	B
25	BARNETT	WHITE	245	27	37.5	98.0	AV	A	B
26	SUGARLOAF	SEBASTIAN	250	12	5.0	12.8	AV	A	B
27	NOLAN (Wright)	SEBASTIAN	350	9	3.1	5.7	AV	A	B
28	FT. SMITH	CRAWFORD	1390		73.0	33.6	BM	W	B
29	SEQUOYAH	WASHINGTON	500	8	275.0	352.0	OH	R	B
30	SWEPCO	BENTON	531	17	14.0	16.9	OH	W	B
31	CHARLES	LAWRENCE	562	8	18.0	20.5	OH	A	B
32	LEE CREEK	CRAWFORD	634	11	465.0	469.4	BM	W	B
33	BEAVERFORK	FAULKNER	900	10	11.5	8.2	AV	R	B
34	HINKLE	SCOTT	965	15	27.5	18.2	AV	A	B
35	BREWER	CONWAY	1165	20	36.4	20.0	AV	W	B
36	JUNE	LAFAYETTE	60	5	4.0	42.7	GC	A	C
37	BAILEY	CONWAY	124	8	7.5	38.7	AV	R	C
38	TRICOUNTY	CALHOUN	280	7	11.5	26.3	GC	A	C
39	COX CREEK	GRANT	300	6	17.0	36.3	GC	A	C
40	FRIERSON	GREENE	335	8	7.3	13.9	DL	A	C
41	STORM CREEK	PHILLIPS	420	7	8.0	12.2	DL	R	C
42	CALION	UNION	510	6	6.7	8.4	GC	A	C
43	POINSETT	POINSETT	550	7	4.5	5.2	DL	A	C
44	BEAR CREEK	LEE	625	10	6.0	6.1	DL	R	C
45	UP WHITE OAK	OUACHITA	630	8	20.7	21.0	GC	A	C

(Part III)

No	Lake	County	Acres	Avg. Depth	Water Shed[1]	W/A[2]	Eco Region[3]	Purpose[4]	Type
46	ATKINS	POPE	750	6	10.2	8.7	AV	A	C
47	OVERCUP	CONWAY	1025	4	17.2	10.7	AV	A	C
48	LO WHITE OAK	OUACHITA	1080	8	42.5	25.2	GC	A	C
49	HARRIS BRAKE	PERRY	1300	6	11.2	5.5	AV	A	C
50	MONTICELLO	DREW	1520	12.5	6.8	2.9	GC	A	C
51	CANE CREEK	LINCOLN	1620	6	24.0	9.5	GC	A	C
52	WILSON	ASHLEY	150	5	1.0	4.3	DL	A	D
53	ENTERPIRSE	ASHLEY	200	5	2.0	6.4	DL	A	D
54	FIRST OLD RIVER	MILLER	200	4	2.0	6.4	GC	A	D
55	PICKTHORNE	LONOKE	207	5	13.2	40.8	DL	A	D
56	HOGUE	POINSETT	280	4	2.0	4.6	DL	A	D
57	GREENLEE	MONROE	300	6	0.5	1.1	DL	A	D
58	MALLARD	MISSISSIPPI	300	6	0.5	1.1	DL	A	D
59	GRAMPUS	ASHLEY	334	6	2.0	3.8	DL	A	D
60	DES ARC	PRAIRIE	350	6	1.0	1.8	DL	A	D
61	WALLACE	DREW	362	5	1.0	1.8	DL	A	D
62	PINE BLUFF	JEFFERSON	500	6	4.0	5.1	DL	A	D
63	ASHBAUGH	GREENE	500	5	1.0	1.3	DL	A	D
64	BOIS D’ARC	HEMPSTEAD	750	4	4.0	3.4	GC	A	D
65	OLD TOWN	PHILLIPS	900	4	23.0	16.4	DL	R	D
66	HORSESHOE	CRITTENDEN	1200	10	13.5	7.2	DL	R	E
67	UPPER CHICOT	CHICOT	1270	15	14.0	7.1	DL	R	E
68	GRAND	CHICOT	1400	7	5.5	2.5	DL	A	E
69	GEORGIA PACIFIC	ASHLEY	1700	4	4.0	1.5	GC	W	E
70	BLUE MOUNTAIN	LOGAN	2900	9	488.0	107.7	AV	F	E
71	COLUMBIA	COLUMBIA	2950	11	48.0	10.4	GC	W	E
72	NIMROD	YELL	3600	8	680.0	120.9	AV	F	E
73	LOWER CHICOT	CHICOT	4030	15	350.0	55.6	DL	R	E
74	CONWAY	FAULKNER	6700	5	136.0	13.0	AV	A	E
75	ERLING	LAFAYETTE	7000	7	400.0	36.6	GC	W	E
76	OZARK	FRANKLIN	10600	14	151801.0	9165.3	AV	N	E
77	FELSENTHAL	BRADLEY	14000	7	10852.0	496.1	GC	R	E
78	MILLWOOD	LITTLE RIVER	29500	5	4144.0	89.9	GC	F	E
79	DARDANELLE	POPE	34300	14	153666.0	2867.2	AV	N	E
		Total	357,896						

1 Watershed measurements indicate square miles.

2 W/A = Watershed (Acres)/Area of Lake

3 OM=Ouachita Mountains; BM=Boston Mountains; OH=Ozark Highlands; AV=Arkansas River Valley; GC=Gulf Coastal Plains; DL=Delta

4 W=Water Supply; F=Flood Control; H=Hydropower; A=Angling (Public Fishing) N=Navigation; R=Recreation

(Part III)

Using lake morphology, ecoregion, and purpose of construction, all of the lakes were grouped in the following manner:

Type A

These are the larger lakes, usually of several thousand acres in size. They have average depths normally 30 to 60 feet and are located in the mountain areas of the State in the Ozark Highlands, Ouachita Mountains and Boston Mountains. The watersheds of most are forest dominated, and the primary purpose of most of these lakes is hydropower and/or flood control. The watershed to lake area ratio (W/A) is relatively large for these impoundments, but the large reservoir volume lengthens the water residence time.

Type B

These are the smaller lakes of the uplands or steeper terrains of the mountainous regions and are probably the most heterogeneous group of lakes. Most are 500 acres or less in size and are located in the Ozark Highlands, Ouachita Mountains and Boston Mountains. Several are located in the more mountainous areas of the Arkansas River Valley. Average depths range from 10 to 25 feet and watersheds are normally dominated by forest lands. The W/A ratios are normally high, which results in a high flushing rate and low water retention time for these smaller lakes.

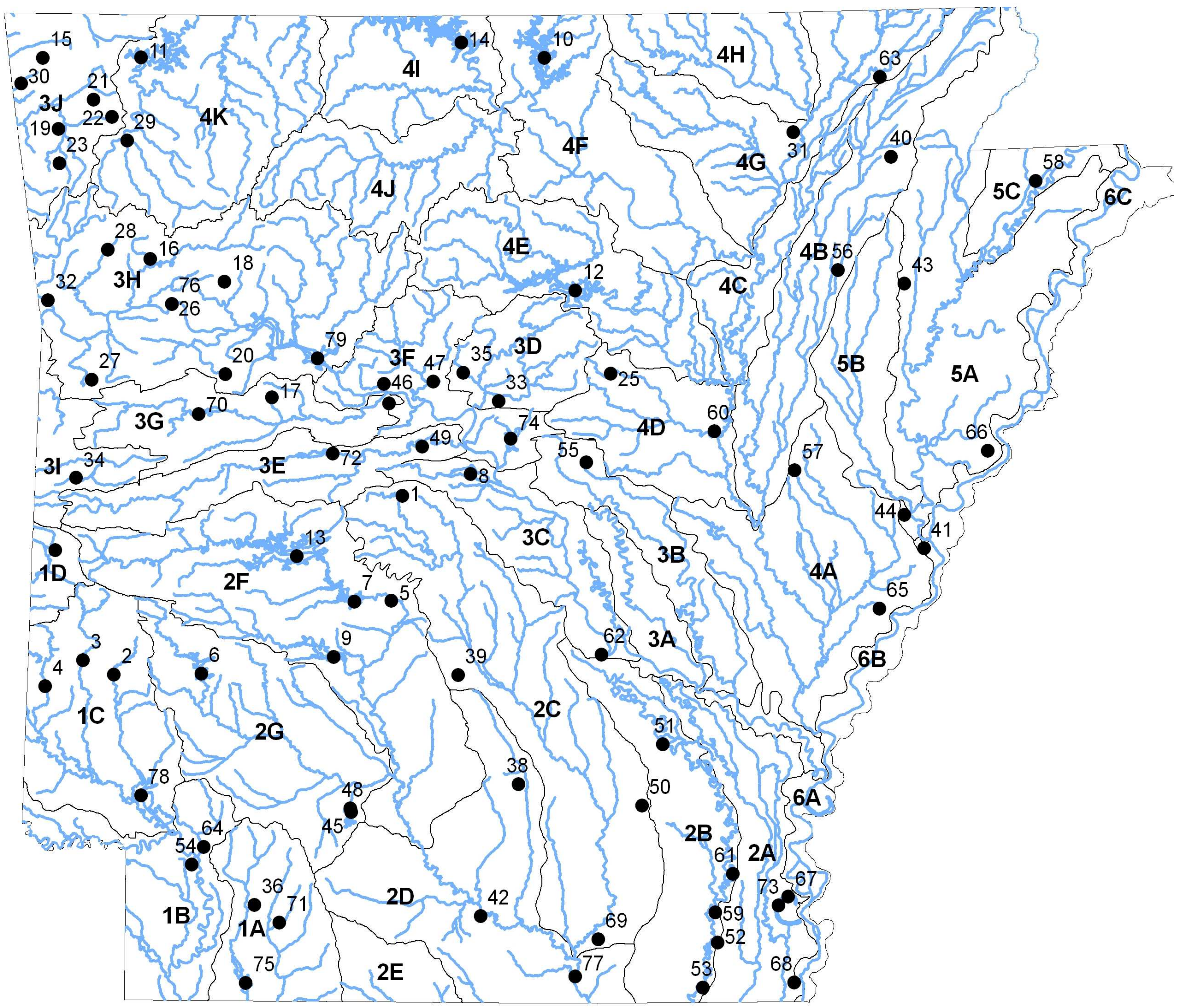
Type C

This group is composed of the smaller lakes of the lowlands or flat terrain areas. Sizes range from 300 to 1,000 acres with average depths of normally less than 10 feet. These lakes are located in the Arkansas River Valley, Gulf Coastal Plains, and Delta ecoregions. The Delta lakes of this group are generally associated with the Crowley's Ridge region. Watersheds of these lakes include timberlands of both lowland hardwoods and pines, but some are broken by pasture land and small farms. These lakes have relatively small storage volumes due to shallow average depths; and those with higher W/A ratios have high flushing rates.

Type D

These are small impoundments of the Delta area of the State, but include two similar type lakes from the large river alluvium of the Gulf Coastal Ecoregion. These type lakes are generally 200 to 500 acres in size with average depths of around five feet. This group includes several, natural oxbow cutoff lakes that have been modified by a water control structure to increase their isolation from the parent stream and maintain higher dry season water levels. These lakes are only occasionally flooded by the parent stream and generally have very small direct runoff watersheds. The other lakes of this type are man made, but they are almost totally isolated from their watershed by levees. Water levels are maintained through occasional pumping from adjacent waterways. Where watersheds exist that discharge directly to the oxbow lakes in this group, the runoff is primarily from row crop agriculture.

Figure III-3: Arkansas' Significant Publicly-Owned Lakes



Type E

These are the large lowland lakes of the Delta, Gulf Coastal Plains, and the large alluvial areas of the Arkansas River Valley Ecoregions. They range from several thousand to over 30,000 acres in size, but average depth is usually less than 10 feet. This group also includes four large, oxbow cutoff lakes that have been substantially modified by construction of drainage ditches, levees, and other water control structures. Watershed types include mixtures of intensive row crop agriculture, small farms and pastures (with increasing amounts of confined animal production), and timberlands.

In cooperation with the Little Rock office of the USGS, the Department initiated a survey on the Type C and D lakes of the Delta and Gulf Coastal Plains ecoregions. The goals of the survey are: 1) to develop a process for identifying potential reference lakes; 2) to collect water quality samples from the lakes to verify reference conditions; and 3) to propose water quality criteria for the lakes. The project is scheduled to be completed in the fall of 2008.

Lakes on the List of Impaired Waterbodies

Fourteen lakes in Arkansas, not including the oxbow lakes in the Ouachita River basin, have had TMDLs completed for mercury contamination of edible fish tissue (Table IV-1). Seven other lakes have TMDLs completed for either nutrients or turbidity.

The majority of the lakes listed in Category 5 on the 303(d) list (Table IV-4) are shown to be impaired by beryllium. The current beryllium standard is lower than the detection limit of most laboratory instruments. This results in reported concentrations above the standard. New standards based on updated USEPA research have been proposed for adoption into the State's water quality regulations. It is anticipated that all of these listings will be removed once the new standards are adopted.

Several other lakes are listed because of elevated turbidity concentrations. The cause of the turbidity in most of the lakes - silt, organics, or tannic waters - is not known. However, it is known that Blue Mountain Lake and upper Beaver Lake are impaired because of excessive silt from storm water runoff.

Impaired Uses of Lakes

Table III -10: Lakes Use Support

Degree of Use Support	Assessment Category		Total Assessed (acres)
	Evaluated	Monitored	
Size Fully Supporting		230,376	230,376
Size Not Supporting		127,520	127,520
Total Assessed (acres)		357,896	357,896

Table III -11: Designated Use Support of Assessed Lakes by Use Type

Use Type	Support (Lake acres)	Non-Support (Lake acres)
Fish consumption	334,259	23,637+
Aquatic life	346,648	11,248
Primary contact	357,896	0
Secondary contact	357,896	0
Domestic Water Supply	260,791	97,105*
Agri & Industrial Water Supply	357,896	0

+ Total surface acres of the oxbow lakes in the Ouachita River basin are unknown.
* See text above.

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Table III -12: Total Sizes of Lakes Listed Not Supporting Uses by Various Source Categories

Source Categories	Number of Lakes	Lake Acres
Surface erosion	1	1500
Unknown	33	~126,020

Table III-13: Total Sizes of Lakes Listed Not Supporting Uses by Various Cause Categories

Cause Categories	Number of Lakes	Lake Acres
Nutrients (nitrogen & phosphorus)	6	4,625
Siltation/Turbidity	3	3,235
Beryllium	9	97,105*
Copper	1	335
Mercury	12	18,677+
Unknown	5	30,485

+ Total surface acres of the oxbow lakes in the Ouachita River basin are unknown.
* See text above.

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(Part III)

CHAPTER SIX WETLANDS

When the first settlers arrived in Arkansas the wetland resources comprised over 8.5 million acres over the State's six ecoregions; most of these wetlands were in the Mississippi Alluvial Plain (Delta). Today, approximately 10 percent, or 800,000 acres, remain (Arkansas Department of Parks and Tourism, 1985).

The Delta is bordered by the Mississippi River on the east and extends to its most westward point at the base of the Ouachita Mountains near Little Rock. From there the Delta extends northeast along the "Fall Line" and Ozark Mountain's foothills into Missouri and southeast from Little Rock along the edge of the Gulf Coastal Plains to Louisiana. This area comprises approximately 15,625 square miles and all or part of 27 of the State's 75 counties.

The Delta's major streams north of the Arkansas River flow through channels carved by the Mississippi River. The Mississippi River once flowed west of Crowley's Ridge and carved river channels that now form the Black, White, and Cache Rivers and Bayou DeView. After the Mississippi River moved east of Crowley's Ridge, it carved a channel that is now the St. Francis River. Over the millenniums, the Mississippi River deposited silt and organic material over the Delta during floods that developed one of the nation's most fertile land areas. The flat slopes of the Delta and the frequent flooding events produced extensive water-tolerant hardwood trees and allowed the formation of numerous "swamps" or wetlands.

Those first settlers found vast acres of bottomland hardwoods in the swamps upon their arrival in Arkansas. For 200 years they cleared the timber to farm the rich, fertile soil. The process was slow and labor intensive with only occasional help from the federal government. After World War II, mechanization allowed the clearing of wetland acreage faster than ever before. A dozer could clear more land in one day than some families could clear in a year only a generation earlier. Ninety percent of wetland acreage cleared in the last 35 to 40 years has been due to the expansion of soybean production (Holder 1969).

In 1849-50, Congress passed the Swamp Land Acts, which transferred more than 7,686,000 acres of public domain land to the State of Arkansas. Funds collected from the sale of these lands were used for flood control structures in the Delta. But major floods occurred in 1858, 1862, 1865, 1871, 1874, 1882, 1883, and 1884 justifying the Mississippi River Commission. The Mississippi River Commission was a cooperative effort of the federal government and local interests, formed in 1879 to address the problems associated with these recurring floods. Levee boards and drainage districts were formed, resulting in swamp drainage and clearing and ditch and levee construction for flood control. The passage of the Flood Control Act of 1928 removed the requirement for the local interests to pay half the cost of levee construction on the Mississippi River. Passage of these various flood control acts resulted in the conversion of thousands of acres of wetlands into productive agricultural lands.

Act 561 of the 1995 State of Arkansas Statutes defines a wetland as "an area that has water at or near the surface of the ground at some time during the growing season (wetland hydrology). It contains plants adapted to wet habitats (hydrophytic vegetation) and is made up of soils that have developed under wet conditions (hydric soils) or any other definition promulgated by the Arkansas Natural Resources Commission (ANRC)."

The term “marsh” appears in the State law under the Arkansas Water and Air Pollution Control Act, Act 472 of 1949, as amended. Subdivision 9(a): “waters of the State, means all streams, lakes, marshes, ponds, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or borders upon this state or any portion thereof.”

Although the State does not have delegated 404 permitting authority, the State has used its Antidegradation Policy to protect wetland resources affected by projects requiring Section 404 dredge and fill permits. The State will deny water quality certification for such projects when, in the opinion of the State, the designated use will no longer be maintained and protected.

Currently, the State does not have a formal policy for Section 401 water quality certifications. Section 401 decisions made by the State are based on its Regulation No. 2, Regulation Establishing Water Quality Standard for Surface Water of the State of Arkansas.

In 1985, the Arkansas Department of Parks and Tourism (ADPT) prepared a Statewide Comprehensive Outdoor Recreation Plan (SCORP) to investigate wetland losses and propose a policy to abate these losses. The 1992 SCORP makes this Wetlands Issue Statement: “Arkansas must define and adopt a statewide no-net-loss wetland policy and take a proactive role to preserve, protect and restore our wetlands.”

Several state agencies are working independently to preserve wetlands within the State. The Arkansas Game and Fish Commission (AGFC), the State’s chief wildlife and fisheries agency, has a long standing commitment to protecting wetlands within the Delta because of its outstanding wildlife importance, particularly to migratory water fowl. The AGFC has acquired 12 areas within the Delta comprising more than 125,000 acres. The Arkansas Natural Heritage Commission (ANHC), an agency of the Department of Arkansas Heritage, focuses on the protection of rare plant and animal species and natural communities. This agency has made a comparable commitment of acquiring legal interest (fee title or conservation easement) in 57 areas of the State. Of these areas, 37 protect approximately 7,425 acres of wetlands and 29 miles of riparian corridor. The agency is also working cooperatively with landowners to manage wetlands along 16 miles of Bayou Dorcheat and its tributaries in Columbia and Lafayette Counties, involving approximately 11,000 acres of bottom land forest and wetlands.

The AGFC and ANHC have committed to additional investments in the Delta and have begun developing comprehensive plans for the Cache/Lower White River Joint Venture Project under the North American Waterfowl Management Plan, and the White River/Lower Arkansas Megasite Plan.

The AGFC owns 3,750 acres of bottomland forest and cypress-tupelo swamp located in Seven Devils Swamp in southeast Arkansas. Through a cooperative agreement, ANHC has a conservation easement for this tract of land. The Ramsar Convention, an international agreement providing the framework for international cooperation for conservation of wetland habitats, proclaimed the five state-and-federally-owned areas as “Wetlands of International

Importance." The designation of the Cache/Lower White River is only the eighth wetland area in the United States to be recognized as a wetland of international importance under the Ramsar Convention. It is one of only nineteen such sites in the United States.

During 1992, the State of Arkansas developed its first comprehensive strategy for protecting wetlands within the State. Four State agencies - AGFC, ANRC, ANHC, and the Arkansas Department of Environmental Quality joined to discuss wetland protection efforts within the State. The group expanded to include the University of Arkansas Cooperative Extension Service, the Arkansas Forestry Commission, ADPT and the Arkansas Highway and Transportation Department, it was named the Multi-Agency Wetlands Planning Team.

In 1993, then Governor Jim Guy Tucker created the Water Resource and Wetlands Task Force "to provide recommendations to the Governor regarding protection of Arkansas's water resources and wetlands." Protection and preservation of Arkansas's water resources, the development of a wetlands policy that meets or exceeds the national wetlands policy, and a cooperative effort towards the development of plans for wetlands restoration and agricultural management practices between Arkansas and seven other delta states was cited in the document. Task force membership included representatives from federal and state agencies, environmental organizations, tourism, agricultural interests, academic institutions, and members of the Arkansas General Assembly.

The Task Force developed the following mission statement:

> "The Wetlands and Water Resource Task Force is to develop recommendations to the Governor that will result in the preservation and protection of Arkansas water and wetland resources, including conserving, enhancing, and restoring the acreage, quality, biological diversity and ecosystem sustainability of Arkansas Wetlands, and recommendations regarding the long term health of the aquifers including surface water projects, restoration and clean water initiatives as they relate to agriculture and wetlands."

Acts 561 and 562 were enacted during the 1995 General Assembly as recommended by the Governor's Wetland Task Force. These acts established the riparian zone/ wetland creation tax credit program and wetland mitigation banking program.

Arkansas Natural Resources Commission administers the Wetland/Riparian Tax Credit Program in consultation with the Private Lands Restoration Committee. This program, created by the Arkansas Private Wetland Riparian Zone Creation and Restoration Incentive Act of 1995, allows a credit against the tax imposed by the Arkansas Income Tax Act for any taxpayer engaged in the development or restoration of wetlands and riparian zones. The program is designed to encourage private landowners to restore and enhance existing wetlands and riparian zones, and when possible, create new wetlands and riparian zones because the State continues to experience significant loss of wetlands, and because most land suitable for wetlands are privately owned. This program benefits the landowners through tax credits and the State by increasing wetlands and riparian zones, which provide flood control, water quality enhancement, fish and wildlife habitat, recreation and ground water recharge.

The Arkansas Wetlands Mitigation Bank Program was established to promote the restoration, maintenance, and conservation of aquatic resources, including wetlands, streams, and deep water aquatic habitats; to improve cooperative efforts among private, nonprofit, and public entities involved in this effort; and to offset losses of aquatic resource values caused by activities which otherwise comply with state and federal laws. This program provides a predictable, efficient framework for environmentally acceptable mitigation including off-site mitigation when such mitigation is required.

The Governor's Water Resources and Wetlands Task Force no longer exists, but the Arkansas Multi-Agency Wetland Planning Team (MAWPT) continues its important work. MAWPT developed The Arkansas Wetland Conservation Plan (PLAN).

The Arkansas Wetlands Conservation Plan consists of two elements:

1. Statewide strategies for wetland protection and restoration (available at www.mawpt.org).

2. Watershed wetland conservation strategies based on GIS inventories and analysis requiring local partnership and decision sharing.

To date, the MAWPT has completed GIS wetland inventories and prioritization for wetland preservation and restoration in all nine of the Wetland Planning Areas of the Delta, and for all of the Arkansas Coastal Plain, Ouachita Mountains, Arkansas River Valley, and Ozark Mountains. The analyses are complete, and Wetland Planning Area and Region Reports have been completed throughout the State. In addition, the MAWPT developed the Arkansas Wetland Strategy, a document containing policy, program, and legislation recommendations for the implementation of the Arkansas Wetland Conservation Plan.

The MAWPT has also been instrumental in developing the hydrogeomorphic approach to wetland classification and functional assessment for Arkansas. To date, the MAWPT has completed a classification for the entire State, which is published on the MAWPT website (www.mawpt.org). This classification includes keys, descriptions of each wetland class with block diagrams illustrating the landscape positions of different wetland community types within the class. Each community type also has a page with a description, photograph, distribution map, and dominant species list. The development of the assessment procedure requires the identification of functions performed by each subclass, development of models for each function that include variables scientifically shown to affect the function, and the calibration of these models using data for reference wetlands in a given geographic region. The MAWPT has identified functions and developed models for the wetlands of the State. The MAWPT has collected data from nearly 800 reference wetlands to calibrate the models. The Regional Guidebook for Conducting Functional Assessments of Forested Wetlands has been published for the Delta Region, Coastal Plain Region, the Ouachita Mountains and Crowley's Ridge Regions, and the Arkansas Valley Region of Arkansas. The final Guidebook, for the Ozark Mountains, is in press.

The HGM Classification and fieldwork for the assessment guidebooks also led to projects developing GIS-based potential natural vegetation maps for the Delta region of the State. These maps allow the MAWPT to predict wetland community types based on a series of abiotic characteristics for areas currently in row agriculture. Combined with the preservation and prioritization maps, this allows areas to be targeted both for their priority, and the community type they represent.

The MAWPT has completed several pilot studies investigating landscape-level assessment methods, and is still working to develop a viable solution.

The MAWPT has also completed several smaller education and public outreach projects. The MAWPT received a grant from USEPA to assist in developing a curriculum for the Potlach Educational Center at Cook's Lake. This curriculum covers wetland topics such as hydrology, water quality, hydric soils, the water cycle, geomorphology, herpetology, tree identification, map-reading skills, and chapters on birds, mammals, litter decomposers, and other wetland residents. The MAWPT has also assisted with presenting many teacher workshops, to help teachers incorporate wetland and water quality concepts into the classroom. The MAWPT published a Landowner's Guide to Voluntary Wetland Programs in Arkansas in 1996 and again in 2000. The MAWPT has also developed an extensive website with information on Arkansas wetlands, wetland functions, historic losses, the HGM classification, and most of the MAWPT publications, including the Landowner's Guide, the Arkansas Wetland Strategy, and the Bayou Meto WPA Report.

The MAWPT has worked cooperatively with the NRCS and The Nature Conservancy to restore a rare headwater swamp wetland in the Delta. They've also cooperated with the Arkansas Stream Team to restore approximately two miles of riparian habitat along Crooked Creek in the Ozark Mountains.

A 320-acre site in Chicot County, Arkansas, referred to as the Camp Nine Mitigation Bank, has been purchased by the State in order to establish the State's first wetland mitigation bank under Act 562 of 1995, the "Arkansas Wetlands Mitigation Bank Act." Credits from the Camp Nine Mitigation Bank (CNMB) can be purchased to offset unavoidable wetland impacts occurring in the southeast region of Arkansas. Further information about CNMB can be obtained by contacting the Arkansas Natural Resources Commission.

Literature Cited for Chapter Six

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Holder, T. 1969. *Disappearing Wetlands in Eastern Arkansas*. Arkansas Planning Commission, Little Rock, Arkansas.

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CHAPTER SEVEN PUBLIC HEALTH/AQUATIC LIFE CONCERNS

Background

The 1994 Water Quality Inventory report contained an in-depth look at bioaccumulative compounds and trace metals in Arkansas's lakes and streams. It was the culmination of a cooperative effort with the Arkansas Game and Fish Commission (AGFC) to collect, analyze and evaluate data on compounds that could affect public health or aquatic life. The report contained data collected from numerous streams, rivers, and lakes. Overall, data collection and/or analysis during the 1994 reporting period was much more extensive than usual. Since that report, the collection and analysis of data has been concentrated on evaluating the mercury problems discussed in the 1994 report.

During the 1996 reporting period, the Department's monitoring program concentrated on mercury and its effects on public health. Edible fish tissue (fillets), usually from predator fishes, was analyzed for metals and pesticides from 32 lakes and numerous stream segments. These results are documented in the "1996 Water Quality Inventory Report."

The fish tissue sampling program has been scaled back from the intensive sampling of the previous years. Since the 1996 reporting period, fish tissue has only been collected from those areas of the State with the greatest risk and highest concentrations of mercury and/or other fish tissue contaminants. From 1999-2004, fish tissue analyses were confined primarily to waters in Arkansas that were selected as a part of the "National Study of Chemical Residues in Lake Fish Tissue."

Public Health and Aquatic Life Impacts

Fish Consumption Advisories

Table III-14 lists the current fish consumption advisories for the State. The most significant health advisory changes in the State over the past few reporting cycles has been the reduction in the total number of stream miles with dioxin advisories.

Arkansas Game and Fish Commission, in cooperation with ADEQ, routinely collects fish tissue samples that are analyzed at ADEQ. ADEQ shares the data with the Arkansas Department of Health, which is responsible for issuing fish consumption advisories. It is important to contact the Department, the Arkansas Department of Health, or the Arkansas Game and Fish Commission for the latest advisories.

Table III-14: Fish Consumption Advisories in Place as of January, 2000

<table>
<tr><th rowspan="3">Waterbody /Reach No.</th><th rowspan="3">Type</th><th rowspan="3">Size Affected</th><th colspan="4">Type Fish Consumption Restricted</th><th rowspan="3">Pollutant of Concern</th></tr>
<tr><th colspan="2">No Consumption</th><th colspan="2">Lim. Consumption</th></tr>
<tr><th>Gen Pop</th><th>High Risk</th><th>Gen Pop</th><th>High Risk</th></tr>
<tr><td rowspan="2">Bayou Bartholomew
08040205–002
08040205–012</td><td>River</td><td>~48 miles</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume flathead catfish, gar, bowfin, pickerel, and blue catfish over 20”, largemouth bass over 12”, or buffalo over 18”.
• The general public should not consume more than 2 meals per month of flathead catfish, gar, pickerel, bowfin, or blue catfish over 20” in length, largemouth bass over 12” in length, or buffalo over 18” in length.</td></tr>
<tr><td rowspan="2">Bayou Meto
08020402–007</td><td>Stream</td><td>~48 miles</td><td>X</td><td>X</td><td></td><td></td><td>Dioxin</td></tr>
<tr><td colspan="7">• Consumption of fish from this area is not recommended due to dioxin contamination. This applies to all risk groups.</td></tr>
<tr><td rowspan="2">Trib. of Big Cr
11140203–XXX</td><td>Stream</td><td>~2 miles</td><td>X</td><td>X</td><td></td><td></td><td>PCBs</td></tr>
<tr><td colspan="7">• This stream is closed to fishing due to polychlorinated biphenyl contamination.</td></tr>
<tr><td rowspan="2">Big Johnson Lake[1]
(Calhoun)</td><td>Lake</td><td>80 acres</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups have no restrictions on consumption of crappie or buffalo. They should not consume all other predators and non-predators.
• The general public has no restrictions on the consumption of crappie or buffalo. They should not consume more than two (2) meals per month of all other predators. There is no restriction on consumption of non-predator fish.</td></tr>
<tr><td rowspan="2">Champagnolle
08040201–003
L. Champagnolle
08040201–003U</td><td>Stream</td><td>~49 miles</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species over 13”.
• The general public should not consume more than 2 meals per month of the predator species over 13”. There are no restrictions on non-predator species.</td></tr>
<tr><td rowspan="2">Columbia Lake</td><td>Lake</td><td>2,950 acres</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups do not have any restrictions on the consumption of crappie, channel or blue catfish. They should not consume all other predators and non-predators.
• The general public has no restrictions on the consumption of largemouth bass less than 16 inches in length, or crappie, channel and blue catfish. They should not consume morel than 2 meals per month of all other predators. There are no restrictions on non-predator fish.</td></tr>
<tr><td rowspan="2">Cove Creek Lake
(Perry County)</td><td>Lake</td><td>46 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass 12” or longer. There are no restrictions on all other predator or non-predator species.
• The general public should not consume more than 2 meals per months of largemouth bass 12-16” in length. They should not consume largemouth bass greater than 16” in length. There are no restrictions on all other predator or non-predator species.</td></tr>
<tr><td rowspan="2">Cut Off Creek
08040205–007</td><td>Stream</td><td>16.8 miles</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should consume no more than 2 meals per month of the predator species. They should d not consume the non-predator species.</td></tr>
</table>

1 These oxbow lakes are listed specifically as advisory areas. See last row of this table.

<table>
<thead>
<tr><th rowspan="3">Waterbody
/Reach No.</th><th rowspan="3">Type</th><th rowspan="3">Size Affected</th><th colspan="4">Type Fish Consumption Restricted</th><th rowspan="3">Pollutant of Concern</th></tr>
<tr><th colspan="2">No Consumption</th><th colspan="2">Lim. Consumption</th></tr>
<tr><th>Gen Pop</th><th>High Risk</th><th>Gen Pop</th><th>High Risk</th></tr>
</thead>
<tbody>
<tr><td rowspan="2">Dorcheat Bayou
11140203–020
11140203–022
11140203–024
11140203–026</td><td>Stream</td><td>50.6 miles</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should not consume largemouth bass >16” in length or consume more than 2 meals per month of all other predator species.</td></tr>
<tr><td rowspan="2">Dry Fork Lake
(Perry County)</td><td>Lake</td><td>104 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass 16” or longer.
• The general public should not consume more than 2 meals per month of largemouth bass 16” in length. There are no restrictions on all other predator and non-predator species.</td></tr>
<tr><td rowspan="2">Dupree Lake</td><td>Lake</td><td><10 acres</td><td>X</td><td>X</td><td></td><td></td><td>Dioxin</td></tr>
<tr><td colspan="7">• Consumption of fish from this area is not recommended due to dioxin contamination. This applies to all risk groups.</td></tr>
<tr><td rowspan="2">Felsenthal Lake</td><td>Lake</td><td>14,000 acres</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups have no restrictions on the consumption of crappie and channel catfish 19” in length or less. They should not consume all other predators. There are no restrictions on the consumption of bluegill, but high risk groups should not consume all other non-predators.
• The general public should not consume more than 2 meals per month of blue catfish 18” in length or less. There are no restrictions on the consumption of crappie or channel catfish 19” in length or less. They should not consume all other predators. There are no restrictions on the consumption of bluegill, but the general public should not consume more than 2 meals a month of all other non-predator fish.</td></tr>
<tr><td rowspan="2">Fourche La Fave River
11110206–002</td><td>River</td><td>8.7 miles</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass 16” or longer. There are no restrictions on all other predator and non-predator species.
• The general public should not consume more than 2 meals per month of largemouth bass 16” or longer. There are no restrictions on all other predator and non-predator species.</td></tr>
<tr><td rowspan="2">Grays Lake
(Cleveland County)</td><td>Lake</td><td>22 acres</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass over 16” in length, flathead catfish over 26” in length, or any gar, bowfin or pickerel.
• The general public should not consume more than two meals per month of gar, bowfin, pickerel, flathead catfish over 26” in length, or largemouth bass 13” to 16” in length.
• The general public should not consume any largemouth bass over 16” in length.</td></tr>
<tr><td rowspan="2">Johnson Hole
Van Buren County</td><td>Lake</td><td>~50 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass over 16” in length.
• The general public should not consume largemouth bass over 16” in length.</td></tr>
<tr><td rowspan="2">Moro Creek
08040201–001</td><td>Stream</td><td>~12 miles</td><td>X</td><td>X</td><td></td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should not consume the predator species. They should not consume more than 2 meals per month of the non-predator species.</td></tr>
<tr><td rowspan="2">Nimrod Lake</td><td>Lake</td><td>3,600 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass 16” in length or greater.
• The general public should consume no more than 2 meals per month of largemouth bass 16” or longer. There are no restrictions on all other predators.</td></tr>
</tbody>
</table>

<table>
<tr><th rowspan="3">Waterbody /Reach No.</th><th rowspan="3">Type</th><th rowspan="3">Size Affected</th><th colspan="4">Type Fish Consumption Restricted</th><th rowspan="3">Pollutant of Concern</th></tr>
<tr><th colspan="2">No Consumption</th><th colspan="2">Lim. Consumption</th></tr>
<tr><th>Gen Pop</th><th>High Risk</th><th>Gen Pop</th><th>High Risk</th></tr>
<tr><td rowspan="2">Ouachita River
08040201–002
08040201–004
08040202–002
08040202–003
08040202–004</td><td>River</td><td>66.3 miles</td><td>X</td><td>X</td><td></td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should not consume the predator species. They should not consume more than 2 meals per month of the non-predator species.</td></tr>
<tr><td rowspan="2">Saline River
08040204–001
08040204–002</td><td>River</td><td>55.8 miles</td><td>X</td><td>X</td><td></td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should not consume the predator species. There are no restrictions on the non-predator species.</td></tr>
<tr><td rowspan="2">Saline River
08040204–004
08040204–006</td><td>River</td><td>33.9 miles</td><td></td><td>X</td><td>X</td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume predator or non-predator species.
• The general public should not consume more than 2 meals per month of the predator or non-predator species.</td></tr>
<tr><td rowspan="2">South Fork Little Red River
11010014–036</td><td>River</td><td>2.0 miles</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume largemouth bass over 16” in length.
• The general public should not consume more than 2 meals per month of largemouth bass 16” long or greater. There are no restrictions for all other predators.</td></tr>
<tr><td rowspan="2">Lake Silvia
(Perry County)</td><td>Lake</td><td>14 Acres</td><td></td><td></td><td>X</td><td>X</td><td></td></tr>
<tr><td colspan="7">• High risk groups should not consume black bass 16” or larger.
• The general public should not consume more than 2 meals per month of largemouth bass 16” or larger.
• There are no restrictions on all other predator or non-predator species.</td></tr>
<tr><td rowspan="2">Lake Monticello</td><td>Lake</td><td>1,240 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume black bass, flathead or blue catfish, 12” or larger, or channel catfish 18” or larger.
• The general public should not consume more than 2 meals per month of black bass 12” to 15” in length, or channel catfish 18” or larger. The general public should not consume flathead catfish, blue catfish, or black bass over 15” in length.</td></tr>
<tr><td rowspan="2">Lake Winona</td><td>Lake</td><td>1,240 acres</td><td></td><td></td><td>X</td><td>X</td><td>Mercury</td></tr>
<tr><td colspan="7">• High risk groups should not consume black bass 16” or larger.
• The general public should not consume more than two meals per month of black bass 16” or larger.</td></tr>
<tr><td rowspan="2">Oxbow Lakes
(See Previous Footnote)</td><td>All types</td><td>Total Area not known</td><td>X</td><td>X</td><td></td><td></td><td>Mercury</td></tr>
<tr><td colspan="7">There is an advisory on all oxbow lakes, backwaters, overflow lakes and bar ditches formed by the Ouachita River below Camden. This includes waters inside the Felsenthal National Wildlife Refuge.
• High risk groups should not consume predator or non-predator species not listed below.
• The general public should not consume predator species not listed below. They should not consume more than 2 meals per month of all non-predator species not listed below. There are no restrictions on the consumption of buffalo or crappie.</td></tr>
</table>

PART IV WATER QUALITY LIMITED WATERBODIES 303(D) LIST

Introduction

Clean Water Act Section 303(d) requires states to identify waters which do not meet or are not expected to meet applicable water quality standards. These water bodies are compiled into a list known as the 303(d) list. *The 2008 list of impaired waterbodies (303(d) list) contained in this report has not yet been approved by the U. S. Environmental Protection Agency*.

Methodology

The methodology used for listing of impaired waters (303(d)) is essentially the same as for the 305(b) assessments. This is detailed in Part III, Chapter Three of this document.

Water Quality Limited Waters

The 2008 list of impaired waterbody segments is divided into two tables: a list of stream segments not currently meeting water quality standards but have completed TMDLs, Table IV-1 and Figure IV-1; and those waterbodies listed in Category 5 as described below, Table IV-2 and Figure IV-2.

The waters listed in Category 5a are those that are truly impaired and require development of a TMDL, unless some other pollution control mechanism is implemented to correct the problem. These waters are illustrated in Figure IV-2.

There are two stream segments listed in Category 5b. These waters currently do not meet water quality standards; however, possible changes to the water quality standards outlined in Regulation No. 2 could result in the de-listing of these stream segments.

Category 5c contains those waterbodies that water quality data indicates impairment, but the data is questionable because of quality control/quality assurance issues. Most segments are listed because of either a metals contamination, or low dissolved oxygen or pH violations. Field QA/QC procedures will be verified to determine the accuracy of these listings.

The stream segments listed in Category 5d are those in need of additional data to verify the accuracy of the assessment. The majority of the listings in this category are for various types of metals contamination. Others include elevated minerals or silt concentrations, and low dissolved oxygen values. Pathogen listings based on fecal coliform data are also listed.

Category 5e listed waters are those impaired by point source discharges; it is anticipated that future permit restrictions will correct the problem.

Stream segments listed in Category 5f are waters that are not currently meeting a water quality standards, however, "the basis for not meeting an applicable water quality standard is not caused by a pollutant, but is attributed to other types of pollution" (EPA, 2005). This is also known as natural or background water quality conditions.

Category 5g listed waters are those waterbodies added to ADEQ's list of Impaired Waterbodies by EPA.

Key to the Abbreviations used on the following tables:

Priority Rank - A ranking of waters in order of need for corrective action taking into account the severity of the pollution and the designated uses of the waters.

H = High priority: highest risk of affecting public health or welfare; substantial impact on aquatic life uses.
M = Medium priority: moderate risk to public health, welfare or to aquatic life uses.
L = Low priority: lowest risk to public health or welfare; secondary impact on aquatic life uses.

Assessed Uses of Waters include: fish consumption, aquatic life communities, primary contact (swimmable), secondary contact (limited body contact), water supply for raw drinking water, agriculture and industrial uses.

S = use is fully supported
N = use not supported
R = designated use removed
M = monitored assessment
E = evaluated assessment

Sources of Contamination - the probable source of the contaminant causing impairment

AG = agriculture activities
SV = silviculture
SE[1] = surface erosion
UR = urban runoff
RE = resource extraction (mining; oil and gas extraction)
UN = unknown
IP = industrial point source
MP = municipal point source
RC = road construction/maintenance
HP = hydropower

Causes of Impairment - the identified contaminant

SI = siltation/turbidity
PA = pathogen indicator bacteria
PO = priority organics
AM = ammonia
NO3 = nitrate nitrogen
TP = total phosphorus
Al = aluminum
Cu = copper
Zn = Zinc
CL = chlorides
SO4 = sulfates
TDS = total dissolved solids
OE = organic enrichment/low dissolved oxygen
NU = nutrients[2]
DO = dissolved oxygen
Pb = Lead
Hg = mercury
Be = beryllium

Notes:
1 Surface Erosion – This category includes erosion from agriculture activities, unpaved road surfaces, in stream erosion, mainly from unstable stream banks, and any other land surface disturbing activity.
2 This listing was used in previous 303(d) lists. TMDLs are currently being developed for these listings.

HUC - Reach - a numerical identifier of a specific segment of a stream

Miles - the total length (in miles) of a specific reach or segment of a stream

Station - water quality monitoring station number

Figure IV-1: Arkansas's Impaired Waterbodies with Completed TMDLs (Categories 4a)

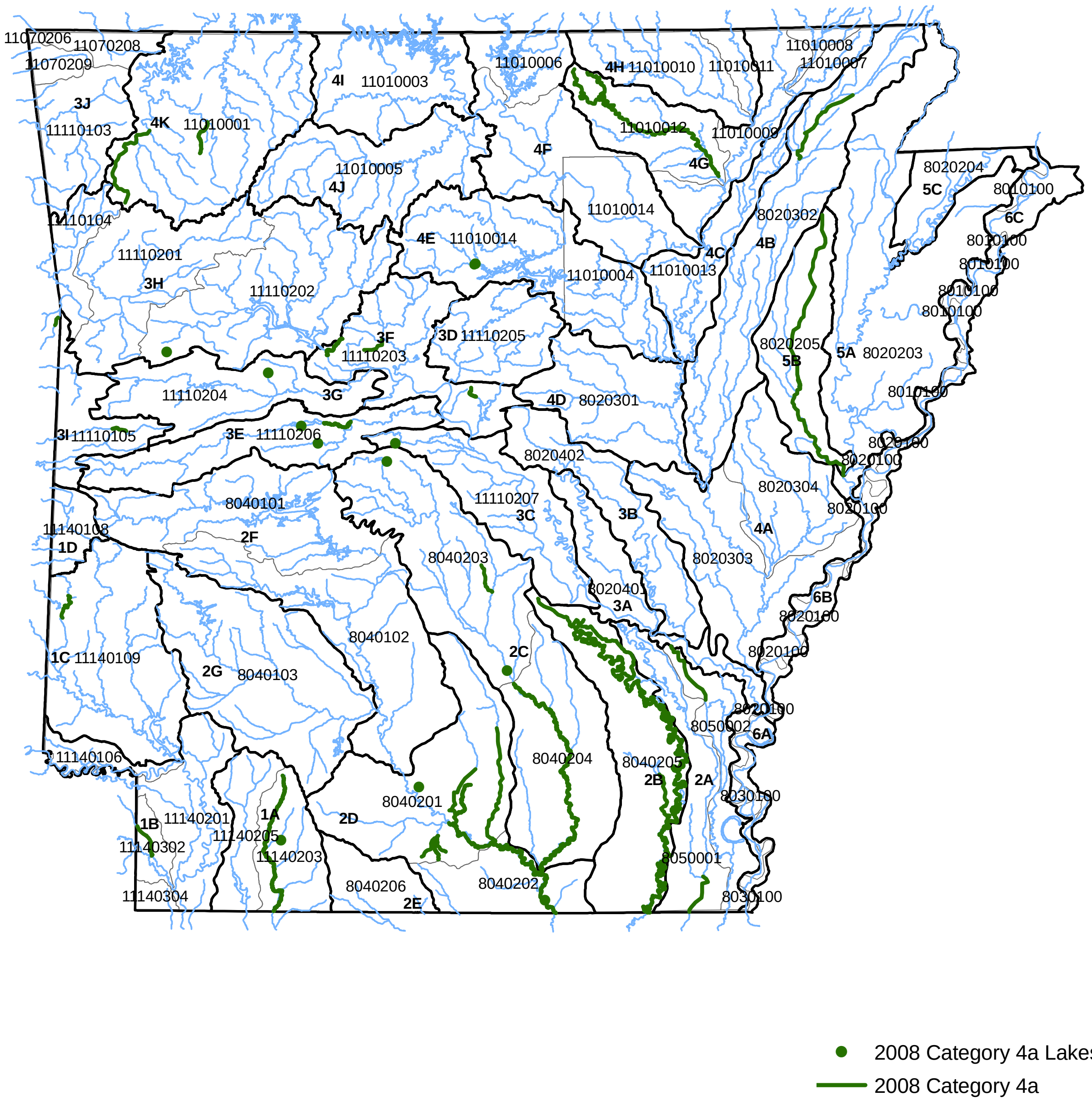

Figure IV-2: Arkansas's Impaired Waterbodies without Completed TMDLs (Category 5)

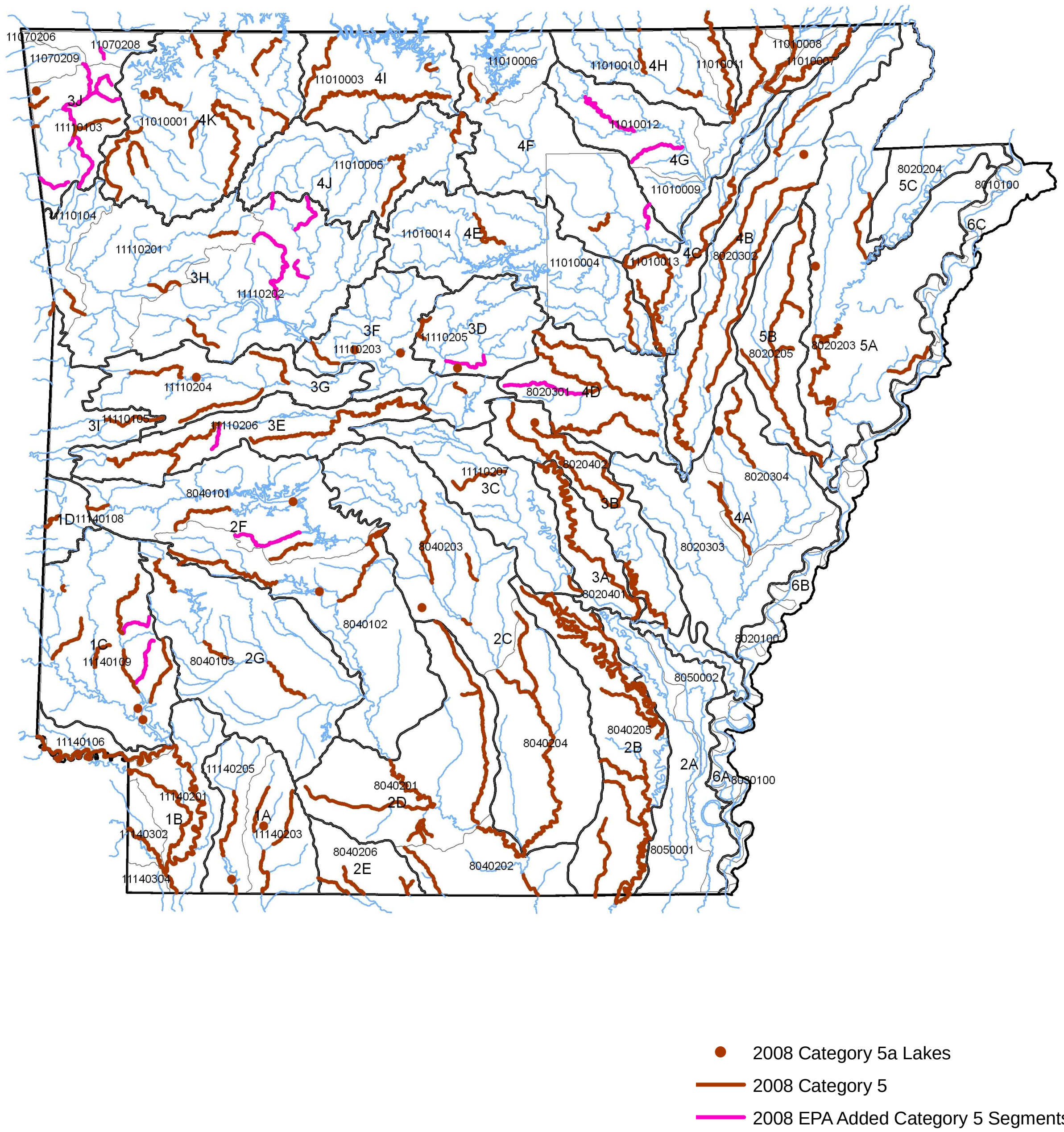

Table IV-1: Water Quality Limited Waterbodies (Category 4a) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	TMDL Date	Year Listed
Dorcheat Bayou	11140203	-022	1A	8.4	RED0015A	M	N						UN				HG				2002	1998
Dorcheat Bayou	11140203	-020	1A	11.9		E	N						UN				HG				2002	1998
Dorcheat Bayou	11140203	-026	1A	23.3	UWBDT01,02	M	N						UN				HG				2002	1998
Dorcheat Bayou	11140203	-024	1A	7.0		E	N						UN				HG				2002	1998
Days Creek	11140302	-003	1B	11.0	RED0004A	M					N		MP				NO3				2006	1998
Rolling Fork	11140109	-919	1C	12.8	RED0058	M		N					IP	IP			NO3	TP			2006	2002
Beouf River	8050001	-018	2A	49.4	OUA0015A	M		N					AG	AG	AG		SI	SO4	CL		2005	1998
Oak Bayou	8050002	-910	2A	18.3	OUA0179	M		N			N	N	AG	AG	AG		SI	CL	TDS		2005	2002
Bayou Bartholomew	8040205	-001	2B	60.1	OUA0013	M		N					AG				SI				2003	1998
Bayou Bartholomew	8040205	-002	2B		UWBYB01	M	N	N					UN	AG			HG	SI			2002/03	1998
Deep Bayou	8040205	-005	2B	28.9	OUA0151	M		N					AG				SI				2003	2002
Bayou Bartholomew	8040205	-006	2B	82.3	OUA0033	M		N					AG				SI				2002	1998
Cutoff Creek	8040205	-007	2B	16.8	UWCOC01	M	N						UN				HG				2002	1998
Bayou Bartholomew	8040205	-912	2B	82.7	UWBYB02	M		N					AG				SI				2003	1998
Bayou Bartholomew	8040205	-013	2B	33.9	UWBYB03	M		N					AG				SI				2003	1998
Bayou Bartholomew	8040205	-012	2B	25	UWBYB02	M	N	N					UN	AG			HG	SI			2002/03	1998
Saline River	8040203	-001	2C	0.2	OUA0010A,117	E	N						UN				HG				2002	1998
Saline River	8040204	-001	2C	2.8		M	N						UN				HG				2002	1998
Saline River	8040204	-002	2C	53		M	N						UN				HG				2002	1998
Saline River	8040204	-004	2C	16.4		M	N						UN				HG				2002	1998
Saline River	8040204	-006	2C	17.5	OUA0118	M	N						UN				HG				2002	1998
Big Creek	8040203	-904	2C	10.0	OUA0018	M		N			N		UN				DO	OE			2007	2002
Ouachita River	8040202	-002	2D	51.8	OUA008B	M	N						UN				HG				2002	1998
Ouachita River	8040202	-003	2D	8.4		M	N						UN				HG				2002	1998
Ouachita River	8040202	-004	2D	49.2	OUA0124B	M	N						UN				HG				2002	1998
Moro Creek	8040201	-001	2D	54.4	OUA0028	M	N						UN				HG				2002	1998
Ouachita River	8040201	-002	2D	22.5	OUA008B	M	N						UN				HG				2002	1998
Ouachita River	8040201	-004	2D	2.5	OUA0037	M	N						UN				HG				2002	1998
L. Champagnolle Cr.	8040201	-903	2D	20.9		M	N						UN				HG				2002	1998
Champagnolle	8040201	-003	2D	20	UWCHC01	M	N						UN				HG				2002	1998
Elcc Tributary	8040201	-606	2D	8.5	OUA0137A+	M		N			N		IP	IP	IP	IP	AM	CL	SO4	TDS	2002	1998
Flat Creek	8040201	-706	2D	16.0	OUA0137C	M		N			N		RE	RE			CL	TDS			2003	1998
Flat Creek	8040201	-706	2D			M		N			N		RE				SO_4				2003	1998
Salt Creek	8040201	-806	2D	8.0	OUA0137D	M		N			N		RE				CL				2003	1998
Salt Creek	8040201	-806	2D			M		N			N		RE				TDS				2003	1998
Fourche LaFave	11110206	-002	3E	8.7		M	N						UN				HG				2002	1998
White Oak Creek	11110203	-927	3F	10.0	ARK0053	M		N					UN				SI				2006	2002
Stone Dam Creek	11110203	-904	3F	3	ARK0051	M		N			N		MP	MP			AM	NO_3			2003	1998
Whig Creek	11110203	-931	3F	10	ARK0067	M		N			N		MP				NO_3				2001	1998
Whig Creek	11110203	-931	3F			M		N			N		MP				Cu				2003	1998
Poteau River	11110105	-001	3I	2.0	ARK0014	M		N					SE				SI				2005	1998
Poteau River	11110105	-031	3I	6.6	ARK0055	M		N					IP	MP			Cu	Zn	TP		2005	1998
Cache River	8020302	-032	4B	11.4		E		N					AG				SI				2006	2002
Cache River	8020302	-031	4B	3.4		E		N					AG				SI				2006	2002
Cache River	8020302	-029	4B	3.9		E		N					AG				SI				2006	2002
Cache River	8020302	-028	4B	5.9	UWCHR04	M		N					AG				SI				2006	2002
Cache River	8020302	-027	4B	3.9		E		N					AG				SI				2006	2002
S. Fk. L. Red River	11010014	-036	4E	2.0		M	N						UN				HG				2002	2002
Strawberry River	11010012	-011	4G	20.4	UWSBR01	M		N					SE				SI				2006	1998

Table IV-1 (cont.): Water Quality Limited Waterbodies (Category 4a) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	TMDL Date	Year Listed
L. Strawberry River	11010012	-010	4G	16.0	WHI0143H+	M		N					SE				SI				2006	2002
Strawberry River	11010012	-009	4G	28.4	UWSBR02	M		N					SE				SI				2006	2002
Strawberry River	11010012	-008	4G	8.4		E		N					SE				SI				2006	2002
Strawberry River	11010012	-006	4G	19.0	WHI0024	M		N					SE				SI				2006	1998
Strawberry River	11010012	-005	4G	0.7		E		N					SE				SI				2006	2002
Strawberry River	11010012	-004	4G	0.3		E		N					SE				SI				2006	2002
Strawberry River	11010012	-002	4G	9.4	UWSBR03	M		N					SE				SI				2006	2002
West Fork	11010001	-024	4K	27.2	WHI0051	M		N					SE				SI				2006	1998
White River	11010001	-023	4K	6.2	WHI0052	M		N					SE				SI				2006	1998
Holman Creek	11010001	-059	4K	9.1	WHI0070	M					N		MP				NO_3				2001	1998
L'Anguille River	8020205	-001	5B	19.7	FRA0010	M		N					AG				SI				2002	1998
L'Anguille River	8020205	-002	5B	16.8		E		N					AG				SI				2002	1998
L'Anguille River	8020205	-003	5B	1.8		E		N					AG				SI				2002	1998
L'Anguille River	8020205	-004	5B	16.0	UWLGR01	M		N	N				AG	AG			SI	PA			2002	1998
L'Anguille River	8020205	-005	5B	44.1	UWLGR02	M		N	N				AG	AG			SI	PA			2002	1998

LAKE NAME	HUC	LAKE TYPE	PLNG SEG	ACRES	COUNTY	ASSESS	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	CAUSE 1	CAUSE 2	CAUSE 3	TMDL DATE	Year Listed
Columbia	11140203	E	1A	2950	Columbia	M	N						UN			HG			2002	2002
First Old River	11140201	D	1B	200	Miller	M		N					UN			NU			2007	2004
Grand	8050002	E	2A	1400	Chicot	M		N					UN			NU			2007	2004
Grays	8040204	NC	2C	36	Cleveland	M	N						UN			HG			2004	2002
Monticello	8040204	B	2C	1520	Drew	M	N						UN			HG			2004	2002
Winona	8040203	A	2C	1240	Saline	M	N						UN			HG			2002	2002
Ouachita River Oxbows below Camden	8040202		2D		Ashley Calhoun Union Bradley Ouachita	M	N						UN			HG			2002	2002
Big Johnson	8040201	NC	2D	49	Calhoun	M	N						UN			HG			2004	2002
Felsenthal	8040202	E	2D	14,000	Bradley	M	N						UN			HG			2004	2002
Cove Creek	11110202	B	3H	160	Logan	M	N						UN			HG			2002	2002
Nimrod	11110206	E	3E	3600	Yell	M	N						UN			HG			2002	2002
Dry Fork	11110206		3E		Perry	M	N						UN			HG			2002	202
Horseshoe	8020203	E	4A	1200	Crittenden	M		N					UN			NU			2007	2004
Frierson	8020302	C	4B	335	Greene	M		N					UN			SI			2007	2004
Johnson Hole	11010014	A	4E		Van Buren	M	N						UN			HG			2002	2002
Spring	11110204	B	3G	82	Yell	M	N						UN			HG			2004	2002
Old Town	8020302	D	5A	900	Phillips	M		N					UN			NU			2007	2004
Bear Creek	8020205	C	5B	625	Lee	M		N					UN			NU			2007	2004
Mallard	8050002	D	5C	300	Mississippi	M		N					UN			NU			2007	2004

Table IV-2: Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Dorcheat Bayou	11140203	-026	1A	11.7	UWBDT02	M							UN	UN			pH	DO			5f	L				
Big Creek	11140203	-923	1A	18.5	UWBIG01	E		N					IP				Pb				5d	L	2008			
Dorcheat Bayou	11140203	-022	1A	8.4	RED0015A	M		N				N	UN	UN	UN	SE	SO4	TDS	Pb	SI	5d	L	2006	2006		
Dorcheat Bayou	11140203	-022	1A			M							UN				pH				5f	L				
Dorcheat Bayou	11140203	-020	1A	11.9		E		N				N	UN	UN	UN	SE	SO4	TDS	Pb	SI	5d	L	2006	2006		
Dorcheat Bayou	11140203	-020	1A			E							UN				pH				5f	L				
Bodcau Creek	11140205	-006	1A	22.4	RED0027	M		N					UN	UN	UN	SE	Cu	Pb	Zn	SI	5d	M	2008	2006	2004	2004
Bodcau Creek	11140205	-006	1A			M							UN				pH				5f	L	2006			
Bodcau Creek	11140205	-002	1A	6.0		E		N					UN	UN	UN	SE	Cu	Pb	Zn	SI	5d	M	2008	2006	2004	2004
Bodcau Creek	11140205	-002	1A			E							UN				pH				5f	L	2006			
Red River	11140106	-025	1B	8.0		E						N	UN	UN	UN		CL	SO4	TDS		5f	L	2006	2008	2008	
Red River	11140106	-005	1B	25.3	RED0025	M						N	UN	UN	UN		CL	SO4	TDS		5f	L	2006	2008	2008	
Red River	11140106	-003	1B	9.8		E						N	UN	UN	UN		CL	SO4	TDS		5f	L	2006	2008	2008	
Red River	11140106	-001	1B	34.8		E						N	UN	UN	UN		CL	SO4	TDS		5f	L	2006	2008	2008	
McKinney Bayou	11140201	-014	1B	21.6	RED0055	M						N	UN	UN			TDS	SO4			5d	L	2006			
McKinney Bayou	11140201	-012	1B	23.1	RED0054	M						N	UN	UN			TDS	SO4			5d	L	2006			
Red River	11140201	-011	1B	15.2	RED0046	M						N	UN	UN			CL	TDS			5f	L	2006	2008		
Red River	11140201	-007	1B	40.1	RED0045	M						N	UN	UN	UN		CL	TDS	SO4		5f	L	2006	2008	2008	
Red River	11140201	-005	1B	12.0		E						N	UN	UN	UN		CL	TDS	SO4		5f	L	2006	2008	2008	
Red River	11140201	-004	1B	4.0		E						N	UN	UN	UN		CL	TDS	SO4		5f	L	2006	2008	2008	
Red River	11140201	-003	1B	15.5	RED0009	M						N	UN				TDS				5f	L	2006			
Red River	11140201	-003	1B			M		N					SE				SI				5d	L	2008			
Sulphur River	11140302	-001	1B	6.3		E							UN				Temp				5f	L	2006			
Sulphur River	11140302	-002	1B	8.5		E							UN				Temp				5f	L	2006			
Sulphur River	11140302	-008	1B	0.8		E		N					SE				SI				5a	H	2004			
Sulphur River	11140302	-008	1B			E							UN				Temp				5f	L	2006			
Sulphur River	11140302	-006	1B	6.5	RED0005	M		N					SE				SI				5a	H	2004			
Sulphur River	11140302	-006	1B			M							UN				Temp				5f	L	2006			
Sulphur River	11140302	-004	1B	0.7		E		N					SE				SI				5a	H	2004			
Sulphur River	11140302	-004	1B			E							UN				Temp				5f	L	2006			
Sulphur River	11140302	-002	1B	8.5		E		N					SE				SI				5a	H	2004			
Sulphur River	11140302	-001	1B	6.3		E		N					SE				SI				5a	H	2004			
Mine Creek	11140109	-933	1C	1.3	RED0048B	M		N					IP	IP	IP		Cu	Zn	SO4		5e	H	2004	2004	2008	
Mine Creek	11140109	-933	1C			M		N					UN				DO				5f	L	2006			
Mine Creek	11170109	-033	1C	11.4	RED0018B	M						N	UN				SO4				5d	L	2008			
Mine Creek	11170109	-033	1C		RED0018B	M			N				UN				PA				5d	L	2008			
Saline River	11140109	-010	1C	23.5	RED0021	M		N					UN				Pb				5d	L	2008			
Blue Bayou	11140109	-009	1C	16.0	BLB0001	M			N				UN				PA				5g	L	2008			
Holly Creek	11140109	-013	1C	6.2	RED0034B	M			N				UN				PA									
Saline River	11140109	-014	1C	25.1	RED0032	M		N					UN				DO				5d	L	2008			
L. Cossatot River	11140109	-920	1C	12.2	LCO01	M		N					UN				TDS				5d	L	2008			
Rolling Fork	11140109	-919	1C	12.8	RED0058	M		N					IP				Cu				5e	H	2006			
Bear Creek	11140109	-025	1C	17.3	RED0033	M					N		MP				NO3				5e	H	2004			
Mountain Fork	11140108	-014	1D	11.0	RED0001	M							UN				Temp				5f	L	2006			
Chemin-A-Haut Cr.	8040205	-907	2B	30.5	OUA0012	M			N				UN				PA				5d	M	2004			
Chemin-A-Haut Cr.	8040205	-907	2B	30.5	OUA0012	M							UN				DO				5f	L				
Cross Bayou	8040205	-905	2B	2.4	OUA0152	M				N			UN				PA				5d	M	2004			
Main Street Ditch	8040205	-909	2B	2.0	OUA0146	M		N					UR	UR			Cu	Pb			5d	M	2006	2006		
Main Street Ditch	8040205	-909	2B			M							UN				DO				5f	L				
Melton's Creek	8040205	-903	2B	8.7	OUA0148	M			N				UN				PA				5d	M	2004			
Harding Creek	8040205	-902	2B	4.6	OUA0145	M		N		N			UR	UR	UR	UR	PA	Cu	Pb	Zn	5d	M	2004	2006	2006	2006
Bayou Imbeau	8040205	-910	2B	7.5	OUA0147	M		N					UR				Pb				5d	M	2006			
Bayou Imbeau	8040205	-910	2B			M							UN				DO				5f	L				

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Able's Creek	8040205	-911	2B	14.6	OUA0158	M		N			N		UN	UN			Be	SI			5d	M	2006	2006		
Bearhouse Creek	8040205	-901	2B	24.4	OUA0155	M		N	N				UN	UN			PA	Pb			5d	M	2004	2006	2006	
Bearhouse Creek	8040205	-901	2B			M							UN				DO				5f	L				
Bayou Bartholomew	8040205	-013	2B	33.9	UWBYB03	M		N	N			N	AG	AG	AG		Pb	TDS	PA		5d	M	2004	2004	2004	
Bayou Bartholomew	8040205	-013	2B			M		N					UN				DO				5d	M	2006			
Cut-Off Creek	8040205	-007	2B	16.8	UWCOC01	M		N					UN				SI				5d	M	2004			
Cut-Off Creek	8040205	-007	2B			M							UN				DO				5f	L				
Bayou Bartholomew	8040205	-006	2B	82.3	OUA0033	M							UN	UN			DO	Pb			5f	L				
Deep Bayou	8040205	-005	2B	28.9	OUA0151	M			N				AG				PA				5d	M	2004			
Jack's Bayou	8040205	-904	2B	6.0	OUA0150	M							UN				DO				5f	L				
Bayou Bartholomew	8040205	-002	2B	17.9	OUA0154	M		N				N	AG				CL				5d	M	2004			
Bayou Bartholomew	8040205	-002	2B			M							UN				DO				5f	L				
Bayou Bartholomew	8040205	-912	2B	82.7	UWBYB02	M		N				N	AG	AG			CL	TDS			5d	M	2004	2004		
Bayou Bartholomew	8040205	-912	2B			M							UN				DO				5f	L				
Bayou Bartholomew	8040205	-001	2B	60.1	OUA0013	M		N					AG				Zn				5d	M	2004			
Wolf Creek	8040205	-701	2B	10.8	OUA0156	M		N					UN				DO				5f	L	2006			
Overflow Creek	8040205	-908	2B	9.9	OUA0012A	M		N					UN	UN			SI	CL			5d	M	2006	2006		
Saline River	8040203	-007	2C	3.8	OUA0042	M					N		UN				Be				5d	L	2006			
Saline River	8040203	-010	2C	29.8	OUA0026,41	M		N				N	SE	UN			SI	TDS			5a	H	2006			
Big Creek	8040203	-904	2C	10.0	OUA0018	M		N					SE				SI				5a	H	2004			
Big Creek	8040203	-904	2C			M		N			N		UN	UN			Pb	Be			5d	L	2004	2006		
Saline River	8040204	-006	2C	17.5	OUA0118	M					N	N	UN	UN			Be	TDS			5d	L	2006			
Big Creek	8040204	-005	2C	28.9	OUA0043	M		N			N		SE	UN	UN		SI	Be	pH		5d	L	2004	2006	2008	
Saline River	8040204	-004	2C	16.4		E		N				N	UN		UN		Cu		TDS		5d	L	2006	2006		2008
Saline River	8040204	-002	2C	53	OUA0010A+	M		N			N	N	UN	UN	UN		Cu	Be	TDS		5d	L	2006	2006	2006	2008
Saline River	8040204	-002	2C	53	OUA0010A+	M		N					UN				Pb				5g	L				
Saline River	8040204	-001	2C	2.8		E		N				N	UN		UN		Cu		TDS		5d	L	2006	2006		2008
Smackover Creek	8040201	-007	2D	29.1		E		N					UN	UN	SE		Zn	DO	SI		5a	M	2006	2006	2006	
Smackover Creek	8040201	-006	2D	14.8	OUA0027	M		N					UN	UN	SE		Zn	DO	SI		5a	M	2006	2006	2006	
Salt Creek	8040201	-806	2D	8.0	OUA0137D	M		N					IP	IP			Cu	Ph			5e	H	2004			
Flat Creek	8040201	-706	2D	16.0	OUA0137C	M		N					IP	IP			Cu	Zn			5e	H	2004			
Elcc Tributary	8040201	-606	2D	8.5	OUA0137A+	M		N			N		IP	IP	IP		NO3	Cu	Zn		5e	H	2004			
Ouachita River	8040201	-005	2D	34.2	OUA0037	M		N					UN	UN			Cu	Zn			5d	L	2004	2004		
Moro Creek	8040201	-001	2D	12.0	OUA0028	M		N					SE				SI				5a	H	2004			
Moro Creek	8040201	-001	2D			M		N					UN	UN	UN		Pb	Zn	Cu		5d	L	2006	2006		
Moro Creek	8040201	-901	2D	57.9		E		N					SE				SI				5a	H	2004			
Moro Creek	8040201	-901	2D			E		N					UN	UN	UN		Pb	Zn	Cu		5d	L	2006	2006		
Jug Creek	8040201	-910	2D	8.0	OUA0047	M		N					MP	MP			Pb	Cu			5e	L	2008			
Bayou De L'Outre	8040202	-008	2D	10.6		E		N					RE/IP				Zn				5a	M	2004	2004		
Bayou De L'Outre	8040202	-008	2D			E						N	RE/IP				TDS	SO4			5a	M	2004	2004		
Bayou De L'Outre	8040202	-007	2D	6.9		E		N					RE/IP				Zn				5a	M	2004	2004		
Bayou De L'Outre	8040202	-007	2D			E						N	RE/IP				TDS	SO4			5a	M	2004	2004		
Bayou De L'Outre	8040202	-006	2D	32.4	OUA0005	M		N					RE/IP				Zn				5a	M	2004	2004		
Bayou De L'Outre	8040202	-006	2D			M						N	RE/IP				TDS	SO4			5a	M	2004	2004		
Ouachita River	8040202	-004	2D	28.9	OUA0124B	M		N					UN				Zn				5d	L	2004			
Ouachita River	8040202	-002	2D	4.0	OUA0008B	M		N					UN	UN			Zn	Cu			5d	L	2004	2008		
Walker Branch	8040206	-916	2E	3.0		E		N					RE	RE			Zn	SI			5c	M	2004	2008		
Walker Branch	8040206	-916	2E			E						N	RE				SO4				5d	M	2004			
Little Cornie Bayou	8040206	-816	2E	3.0		E		N					RE	RE			Zn	SI			5c	M	2004	2008		
Little Cornie Bayou	8040206	-816	2E			E						N	RE				SO4				5d	M	2004			
Little Cornie Bayou	8040206	-716	2E	5.0		E		N					RE	RE			Zn	SI			5c	M	2004	2008		
Little Cornie Bayou	8040206	-716	2E			E						N	RE				SO4				5d	M	2004			

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Little Cornie Creek	8040206	-016	2E	18.0		E		N					RE	RE			Zn	SI			5c	M	2004	2008		
Little Cornie Creek	8040206	-016	2E			E						N	RE				SO4				5d	M	2004			
Big Cornie Creek	8040206	-015	2E	15.0	OUA0002	M		N					RE	RE			Zn	SI			5c	M	2004	2008		
Big Cornie Creek	8040206	-015	2E			M						N	RE	UN			SO4	Be			5d	M	2004	2006		
Cove Creek	8040102	-970	2F	9.6	OUA0159	M		N				N	RE	RE	RE		SO4	TDS	Zn		5a	H	2004	2006	2006	
Cove Creek	8040102	-970	2F			M					N		RE				Be				5a	H	2006			
Chamberlain Creek	8040102	-971	2F	2.5	OUA0104	M		N			N	N	RE	RE	RE	RE	pH	CL	SO4	TDS	5a	H	2006	2006	2006	2006
Chamberlain Creek	8040102	-971	2F			M		N			N	N	RE	RE	RE	RE	Cd	Cu	Zn	Be	5a	H	2006	2006	2006	2006
Lucinda Creek	8040102	-975	2F	2.2	OUA0171B	M		N			N	N	RE	RE	RE	RE	pH	SO4	Zn	Be	5a	H	2006	2006	2006	2006
Ouachita River	8040102	-007	2F	14.5	OUA0006	M					N		UN	UN			Be	Zn			5d	L	2006			
S. Frk Ouachita River	8040101	-043	2F	22.0	UWSFO01	E			N				UN				PA				5d	M	2008			
Marzarn Creek	8040101	-045	2F	23.3	UWMZC01	M		N					UN				pH				5g	L	2008			
Prairie Creek	8040101	-048	2F	10.0	OUA0040	M		N					SE	UN	UN		SI	Cu	DO		5d	M	2004	2008		
S. Fork Caddo	8040102	-023	2F	16.6	OUA0044	M		N					RE	RE			Cu	Zn			5a	H	2004	2004		
Caddo River	8040102	-019	2F	7.7		E		N					RE				Zn				5c	L	2004			
Caddo River	8040102	-018	2F	4.1		E		N					RE				Zn				5c	L	2004			
D.C. Creek	8040102	-923	2F	5.0	OUA0044T	M					N		RE	RE			Be	Zn			5c	L	2006	2008		
Ouachita River	8040102	-006	2F	12.1	OUA0030	M		N					UN				Zn				5d	L	2008			
Caddo River	8040102	-016	2F	13.5	OUA0023	M		N					RE				Zn				5c	L	2004			
Caddo River	8040102	-016	2F			M					N		RE				Be				5d	L	2006			
Little Mazarn Creek	8040101	-047	2F	14.8	UWSFM01	M		N					UN				pH				5f	L	2008			
L. Missouri River	8040103	-008	2G	19.6	OUA0035	M		N					UN	UN			Cu	Zn			5d	L	2006		2008	
L. Missouri River	8040103	-022	2G	17.6	OUA0022	M		N					UN				Zn				5d	L	2006			
L. Missouri River	8040103	-015	2G	10.5	OUA0039B	M		N					UN	UN			Zn	Pb			5d	L	2008	2008		
Wabbaseka Bayou	8020401	-003	3A	101.7	UWWSB01	M							UN				DO				5f	L	2006			
Bayou Meto	8020402	-001	3B	4.3		E		N					UN				DO				5f	L	2006			
Bayou Meto	8020402	-003	3B	39.8	ARK0023	M		N					UN				DO				5f	L	2006			
Bayou Two Prairie	8020402	-006	3B	44.7	ARK0097	M							UN				DO				5f	L	2006			
Bayou Meto	8020402	-907	3B	12.3	ARK0060	M							UN				DO				5f	L	2006			
Bayou Meto	8020402	-907	3B			M		N					UN				Pb				5d	L	2008			
Bayou Meto	8020402	-007	3B	44.8	ARK0050	M	N	N					IP	IP			PO	Cu			5e	H	998/2006		2008	
Arkansas River	11110207	-001	3C	6.7	ARK0048	M					N		UN				Be				5b	L	2006			
Fourche Creek	11110207	-024	3C	11.2	ARK0130+	M							UN				DO				5f	L	2006			
Fourche Creek	11110207	-024	3C			M			N				UN				PA				5g	L	2008			
Fourche Creek	11110207	-024	3C			M					N		UN				SI				5a	L	2008			
Fourche Creek	11110207	-024	3C			M		N			N		UN	UN	UN		Zn	Cu	Be		5d	L	2008			
Fourche Creek	11110207	-022	3C	9.2	ARK0131+	M		N					SE				SI				5a	H	2006			
Fourche Creek	11110207	-022	3C			M							UN				DO				5f	L	2006			
Fourche Creek	11110207	-022	3C			M			N				UN				PA				5g	L	2006			
E. Fork Cadron Creek	11110205	-002	3D	15.6	ARK0158	M		N					UN				SI				5g	L	2008			
Cypress Creek	11110205	-917	3D	11.2	ARK0132	M		N					AG	AG			Cu	Zn			5d	L	2006	2006		
S. Fourche LaFave	11110206	-014	3E	26.1	ARK0052	M							UN				DO				5f	L				
S. Fourche LaFave	11110206	-013	3E	10.3		E							UN				DO				5f	L				
Fourche LaFave R.	11110206	-007	3E	20.2	ARK0037	M							UN				DO				5f	L				
Fourche LaFave R.	11110206	-007	3E			M		N					UN				SI				5a	H	2006			
Fourche LaFave R.	11110206	-008	3E	25.7	UWFLR01	M							UN				pH				5f	L	2008			
Fourche LaFave R.	11110206	-001	3E	25.7	ARK0036	M							UN				DO				5f	L	2008			
Cedar Creek	11110206	-011	3E	10.1	UWCED01	M		N					UN				pH				5d	L	2008			
Gafford Creek	11110206	-012	3E	8.5	UWGAF01	M		N					UN				pH				5g	L	2008			
Stone Dam Creek	11110203	-904	3F	3.0	ARK0051	M		N					UN				Zn				5d	L	2008			
Arkansas River	11110203	-932	3F	2.0	Special study	M		N					HP				DO				5a	H	2002			

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Arkansas River	11110203	-031	3F	9.4	ARK0032	M						N	UN				TDS				5f	L				
Chickalah Creek	11110204	-002	3G	19.3	ARK0058	M		N					UN				SI				5f	L	2008			
Petit Jean River	11110204	-011	3G	21.6	ARK0034	M		N			N		UN				Be				5d	L	2006	2008		
Dutch Creek	11110204	-015	3G	28.9	ARK0057	M		N					UN				DO				5f	L	2006			
Arkansas River	11110201	-001	3H	12.4	ARK0033	M						N	UN				TDS				5f	L				
Arkansas River	11110104	-001	3H	11.0	ARK0038	M					N	N	UN	UN			CL	TDS			5f	L	2008	2008		
Mulberry River	11110201	-009	3H	9.1	ARK0138	M							UN				pH				5f	L				
Big Piney Creek	11110202	-018	3H	5.8	ARK0105	M			N				UN				PA				5g	L	2008			
Hurricane Creek	11110202	-022	3H	15.4	ARK0119	M			N				UN				PA				5g	L	2008			
Little Piney Creek	11110202	-024	3H	6.2	ARK0104	M			N				UN				PA				5g	L	2008			
Little Piney Creek	11110202	-025	3H	27.2	ARK1025	M			N				UN				PA				5g	L	2008			
Mill Creek	11110202	-901	3H	8.6	ARK0110	M			N				UN				PA				5g	L	2008			
Walnut Creek	11110202	-902	3H	5.1	ARK0125	M			N				UN				PA				5g	L	2008			
Short Mountain Cr.	11110202	-043	3H	14.9	ARK0011B	M		N					MP				Cu				5e	H	2004			
Poteau River	11110105	-001	3I	2.0	ARK0014	M		N					UN	UN			DO	Zn			5d	L	2008	2008		
Poteau River	11110105	-931	3I	12.8	ARK0054	M		N					SE				SI				5d	L	2008			
Poteau River	11110105	-031	3I	6.6	ARK0055	M					N	N	MP/IP				CL	SO4	TDS		5e	M	2008			
Baron Fork	11110103	-013	3J	10.0	ARK0007A	M			N				UN				PA				5g	L	2008			
Illinois River	11110103	-020	3J	1.6	ARK0006	M		N					SE				SI				5d	L	2008			
Illinois River	11110103	-023	3J	8.1	ILL04	M			N				UN				PA				5g	L	2008			
Clear Creek	11110103	-029	3J	13.5	ARK0010C	M			N				UR				PA				5d	L	2004			
Illinois River	11110103	-024	3J	2.5	ARK0040	M		N					SE				SI				5d	L	2008			
Illinois River	11110103	-024	3J	2.5	ARK0040	M			N				UN				PA				5g	L	2008			
Muddy Fork Illinois River	11110103	-025	3J	3.2	MFI0004	M		N	N				UN	UN			PA	TP			5g	L	2008			
Illinois River	11110103	-028	3J	19.9	Ill01	M		N	N				UN	UN			PA				5g	L	2008			
Osage Creek	11110103	-030	3J	15.0	ARK0041	M		N	N				UN	UN			PA	TP			5g	L	2008			
Osage Creek	11110103	-930	3J	10.2	OSC03	M		N	N				UN	UN			TP				5g	L	2008			
Little Osage Creek	11110103	-933	3J	11.9	ARK0155	M		N	N				UN	UN			PA				5g	L	2008			
Spring Creek	11110103	-931	3J	8.4	SPG01	M		N	N				UN	UN			PA	TP			5g	L	2008			
Sager Creek	11110103	-932	3J	8.0	ARK0005	M					N		MP				NO3				5e	H	2006			
Town Branch	11070208	-901	3J	3.0	ARK0056	M							UN				TP				5g	L				
Boat Gunwale Slash	8020304	-914	4A	5.0	WHI0074	M							UN				DO				5f	L				
Prairie Cypress	8020304	-014	4A	26.1	WHI0073	M							UN				DO				5f	L				
Big Creek	8020304	-010	4A	34.3	UWBGC03	M						N	AG	AG			CL	TDS			5d	L	2004	2004		
Cache River	8020302	-032	4B	11.4		E		N				N	AG	AG			Pb	TDS			5d	L	2004	2006		
Cache River	8020302	-031	4B	3.4		E		N				N	AG	AG			Pb	TDS			5d	L	2004	2006		
Cache River	8020302	-029	4B	3.9		E		N				N	AG	AG			Pb	TDS			5d	L	2004	2006		
Cache River	8020302	-028	4B	5.9	UWCHR04	M		N				N	AG	AG			Pb	TDS			5d	L	2004	2006		
Cache River	8020302	-028	4B			M			N				UN				PA				5g	L	2008			
Cache River	8020302	-027	4B	3.9		E		N				N	AG	AG			Pb	TDS			5d	L	2004	2006		
Cache River	8020302	-021	4B	18.4		E		N					AG				Pb				5d	L	2004			
Cache River	8020302	-020	4B	22.6	UWCHR03	M		N					AG				Pb				5d	L	2004			
Cache River	8020302	-019	4B	13.7		E		N					AG				Pb				5d	L	2004			
Cache River	8020302	-018	4B	25.0	UWCHR02	M		N					AG				Pb				5d	L	2004			
Cache River	8020302	-017	4B	15.8		E		N					AG				Pb				5d	L	2004			
Cache River	8020302	-016	4B	21.8	WHI0032	M		N					AG				Pb				5d	L	2004			
Bayou DeView	8020302	-009	4B	20.3	WHI0026	M						N	AG	MP			TDS	CL	AL		5a	H	2004	2004		
Bayou DeView	8020302	-007	4B	18.2		E		N					AG				Pb				5d	L	2006			
Bayou DeView	8020302	-006	4B	10.2		E		N					AG				Pb				5d	L	2006			
Bayou DeView	8020302	-005	4B	8.6		E		N					AG				Pb				5d	L	2006			
Bayou DeView	8020302	-004	4B	21.2	UWBDV02	M		N					AG				Pb				5d	L	2006			
Lost Creek Ditch	8020302	-909	4B	7.9	WHI0172	M		N			N		UN				Be				5d	M	2006	2006	2006	2006

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Lost Creek Ditch	8020302	-909	4B			M					N	N	IP				CL				5d	M	2008			
Departee Creek	11010013	-020	4C	46.1	UWDTC01	M		N					AG				Zn				5d	L	2006			
Glaise Creek	11010013	-021	4C	30.1	UWGSC01	M		N					AG				Zn				5d	L	2006			
Glaise Creek	11010013	-021	4C	30.1	UWGSC01	M			N				UN				PA				5g	L	2008			
Village Creek	11010013	-008	4C	13.0		M			N				UN				PA				5g	L	2008			
Village Creek	11010013	-008	4C	13.0		E							UN				DO				5f	L				
Village Creek	11010013	-007	4C	1.2		E							UN				DO				5f	L				
Village Creek	11010013	-006	4C	25.2	UWVGC01+	M							UN				DO				5f	L				
Wattensaw Bayou	8020301	-015	4D	48.2	WHI0072	M							UN				DO				5f	L				
Cypress Bayou	8020301	-010	4D	5.0	UWCPB01	M		N	N				AG				Pb				5d	L	2006	2004		
Cypress Bayou	8020301	-010	4D			M			N				UN				PA				5g	L	2008			
Cypress Bayou	8020301	-011	4D	9.5		E			N				UN				PA				5g	L	2008			
Cypress Bayou	8020301	-012	4D	17.5		E			N				UN				PA				5g	L	2008			
Bull Bayou	8020301	-009	4D	29.0	UWBLB01	M		N					AG				Zn				5d	L	2006			
Bull Bayou	8020301	-009	4D			M			N				UN				PA				5g	L	2008			
Bayou Des Arc	8020301	-007	4D	36.4	UWBDA01	M		N					AG				Zn				5d	L	2006			
Bayou Des Arc	8020301	-006	4D	17.8	WHI0056	M		N					AG				Zn				5d	L	2006			
M. Fk. Little Red	11010014	-028	4E	12.0		E			N				UN				PA				5d	H	2004			
M. Fk. Little Red	11010014	-027	4E	8.8	WHI0043	M			N				UN				PA				5d	H	2004			
Overflow Creek	11010014	-006	4E	21.7	UWOFC01	M		N					AG				Zn				5d	L	2006			
Overflow Creek	11010014	-004	4E	0.6		E		N					AG				Zn				5d	L	2006			
North Fork River	11010006	-001	4F	4.2	USGS	M		N					HP				DO				5a	H	2004			
Hicks Creek	11010004	-015	4F	9.1	WHI0065	M			N				MP				PA				5e	H	2006			
Greenbrier Creek	11010014	-017	4F	10.6	WHI0167	M		N					UN				DO				5f	L	2006			
Greenbrier Creek	11010014	-017	4F			M			N				UN				PA				5g	L	2008			
Big Creek	11010014	-018	4F	9.4	WHI0164	M			N				UN				PA				5g	L	2008			
Black River	11010007	-001	4G	24.2		E		N					UN				DO				5f	L	2006			
Black River	11010007	-002	4G	22.7	WHI0003	M		N					UN				DO				5f	L	2006			
Current River	11010008	-017	4G	12.0		E		N					SE				SI				5a	M	2006			
Current River	11010008	-017	4G			E		N					UN				DO				5f	L	2006			
Current River	11010008	-001	4G	23.6	WHI0004	M		N					SE				SI				5a	M	2006			
Current River	11010008	-001	4G			M		N					UN				DO				5f	L	2006			
Black River	11010009	-005	4G	17.5	WHI0025	M		N					UN				DO				5f	L	2006			
Fourche River	11010009	-008	4G	25.0	WHI0170	M		N					SE				SI				5d	L	2006			
Strawberry River	11010012	-009	4G	28.4	UWSBR02	M			N				UN				PA				5g	L	2008			
South Big Creek	11010012	-013	4G	19.3	WHI0143J	M			N				UN				PA				5g	L	2008			
Spring River	11010010	-003	4H	9.4	WHI0021	M		N					SE				SI				5d	M	2006			
Spring River	11010010	-003	4H			M		N					UN				DO				5f	L	2006			
Spring River	11010010	-007	4H	4.0		E		N					UN				Temp				5f	L	2006			
Spring River	11010010	-006	4H	5.3	WHI0022	M		N					UN				Temp				5f	L	2006			
Warm Fork Spring R.	11010010	-008t	4H	3.1	WHI0006A	M		N				N	UN	UN			DO	TDS			5d	M	2004	2006		
Eleven Point River	11010011	-001	4H	33.1	WHI0005B	M		N					UN				DO				5f	L	2006			
Crooked Creek	11010003	-048	4I	31.7	WHI0048A+	M		N					RE				Temp				5a	L	2004			
Crooked Creek	11010003	-048	4I			M						N	UN				TDS				5a	L				
Crooked Creek	11010003	-049	4I	36.2	WHI0067+	M		N				N	UN	UN	UN	UN	TDS	CL	Be	SO4	5a	L	2006	2006	2006	2008
White River	11010003	-902	4I	3.0	USGS	M		N					HP				DO				5a	H	2004			
Bear Creek	11010003	-045	4I	25.9	WHI0174	M					N		UN				Be				5d	L	2006			
Big Creek	11010005	-027	4J	2.6	BUFT18	M		N					UN				DO				5f	L	2008			
Bear Creek	11010005	-026	4J	23.9	UWBRK01+	M						N	MP				TDS				5d	L	2004			
Buffalo River	11010005	-001	4J	11.3	BUFR09	M		N					UN				Temp				5f	L	2006			
Buffalo River	11010005	-005	4J	6.9	WHI0049A	M		N					UN				DO				5f	L	2006			
Holman Creek	11010001	-059	4K	9.1	WHI0070	M					N	N	MP				TDS				5a	L	2004			

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

STREAM NAME	HUC	RCH	PLNG SEG	MILES	MONITORING STATIONS	ASSESS TYPE	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	Category	Priority	Year Listed 1	Year Listed 2	Year Listed 3	Year Listed 4
Leatherwood Creek	11010001	-916	4K	7.6	WHI0012B	M		N					UN				DO				5d	L	2008			
Kings River	11010001	-037	4K	19.1	WHI0009A	M						N	UN				TDS				5d	L	2004			
Kings River	11010001	-042	4K	39.5	WHI0123	M		N			N	N	UN	UN	UN		Be	TDS	DO		5d	L	2006	2006	2008	
Dry Fork Creek	11010001	-043	4K	16.5	WHI0127	M					N		UN				Be				5d	L	2006			
Osage Creek	11010001	-047	4K	13.4	WHI0130	M					N		UN				Be				5d	L	2006			
Yocum Creek	11010001	-052	4K	16.2	WHI0137	M					N		UN				Be				5d	L	2006			
White River	11010001	-027	4K	23.8	WHI0106	M		N			N		UN	UN			DO	Be			5d	L	2004	2006		
White River	11010001	-023	4K	6.2	WHI0052	M						N	UN	UN	UN		TDS	CL	SO4		5a	M				
West Fork	11010001	-024	4K	27.2	WHI0051	M		N					UN				DO				5f	M	2006			
West Fork	11010001	-024	4K			M						N	UN	UN			SO4	TDS			5a	M				
M. F. White River	11010001	-026	4K	8.1	WHI0103	M		N					UN				DO				5d	M	2006			
War Eagle Creek	11010001	-034	4K	22.2	WHI0116	M					N		UN				Be				5d	M	2006			
St. Francis River	8020203	-014	5A	22.8	FRA0008	M		N					UN				DO				5c	L	2004			
St. Francis River	8020203	-014	5A			M		N			N	N	UN	UN			CL	Be			5d	L	2004	2006	2006	
St. Francis River	8020203	-009	5A	17.1		E						N	AG				CL				5d	L	2006	2006		
St. Francis River	8020203	-008	5A	55.9	FRA0013	M						N	AG				CL				5d	L	2006	2006		
Ten Mile Bayou	8020203	-006t	5A	17.3	FRA0029	M		N					UN				DO				5f	L	2006			
Caney Creek	8020203	-901	5B	9.0	FRA0034	M						N	MP				TDS				5b	L	2004			
Second Creek	8020205	-008	5B	16.4	FRA0012	M		N					AG				DO				5c	L	2004			
L' Anguille River	8020205	-005	5B	44.1	UWLGR02	M						N	AG	AG	AG		CL	SO4	TDS		5a	L	2004	2004	2004	
L' Anguille River	8020205	-005	5B			M		N					UN				DO				5f	L				
L' Anguille River	8020205	-004	5B	16.0	UWLGR01	M						N	AG	AG			CL	TDS			5a	L	2004	2004	2004	
L' Anguille River	8020205	-004	5B			M		N					UN				DO				5f	L				
L' Anguille River	8020205	-003	5B	16.8		E						N	AG	AG			CL	TDS			5a	L	2006	2004		
L' Anguille River	8020205	-003	5B			E		N					UN				DO				5f	L				
L' Anguille River	8020205	-002	5B	1.8		E						N	AG	AG			CL	TDS			5a	L	2006	2004		
L' Anguille River	8020205	-002	5B			E		N					UN				DO				5f	L				
L' Anguille River	8020205	-001	5B	19.7	FRA0010	M						N	AG	AG			CL	TDS			5a	L	2006	2004		
L' Anguille River	8020205	-001	5B			M		N					UN				DO				5f	L				
Prairie Creek	8020205	-902	5B	12.8	FRA0035	M					N		AG	AG	AG		CL	SO4	TDS		5d	L	2006			

Table IV-2 (cont.): Water Quality Limited Waterbodies (Category 5) – 303(d) List

LAKE NAME	HUC	LAKE TYPE	PLNG SEG	ACRES	COUNTY	ASSESS	FISH COMSUMP	AQUATIC LIFE	PRIMARY CONTACT	SECONDARY CONTACT	DRINKING WATER	AGRI & INDUSTRY	SOURCE 1	SOURCE 2	SOURCE 3	CAUSE 1	CAUSE 2	CAUSE 3	Category	Priority	Year Listed
Earling	11140205	E	1A	7000	Lafayette	M					N		UN			Be			5d	L	2006
Columbia	11140203	E	1A	2950	Columbia	M					N		UN			Be			5d	L	2006
Millwood	11140109	E	1C	29,500	Little River	M					N		UN			Be			5d	L	2006
DeQueen	1114109	A	1C	1680	Sevier	M					N		UN			Be			5d	L	2006
Cox Creek	8040203	C	2C	300	Grant	M		N					UN			UN*			5d	L	
DeGray	8040102	A	2F	13,200	Clark	M					N		UN			Be			5d	L	2006
Ouachita	8040101	A	2F	40,100	Garland	M					N		UN			Be			5d	L	2006
Pickthorne	8020402	D	3B	207	Lonoke	M		N					UN			UN*			5d	L	
Beaverfork	11110205	B	3D	900	Faulkner	M					N		UN			Be			5d	L	2006
Atkins	11110203	C	3F	750	Pope	M					N		UN			Be			5d	L	2006
Overcup	11110203	C	3F	1025	Conway	M					N		UN			Be			5d	L	2006
Blue Mountian	11110204	E	3G	2900	Logan	M		N					UN			SI			5d	L	
Swepco	11110103	B	3J	531	Benton	M		N					UN			UN*			5d	L	
Greenlee	8020304	D	4A	300	Monroe	M		N					UN			UN*			5d	L	
Frierson	8020302	C	4B	335	Greene	M		N					UN			Cu			5a	M	2002
Beaver - Upper	1101001	A	4K	1500	Washington	M		N					SE			SI			5a	H	
Poinsette	8020203	C	5A	550	Poinsette	M		N					UN			UN*			5d	L	

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PART V GROUND WATER ASSESSMENT

Introduction

Section 106(e) of the Clean Water Act specifies that each state monitor the quality of its ground water resources and report the results to Congress on a biennial basis in its State 305(b) report. The 1996 guidance for preparation of the 305(b) report contained many changes from the original broad-based approach, which is evidenced by the changes in the 1996 report for Arkansas. These changes included two tables: 1) a summary of State ground water protection programs and, 2) a listing of the major sources of contamination in the State. The table format was designed by USEPA primarily for uniformity in reporting by the States.

Current guidance documents have varied little from the changes implemented in the 1996 guidance. USEPA continues to encourage states to 1) work toward assessing all ground waters of the state from the various aquifers; 2) use prescribed table formats for consistency among all states of the nation, and; 3) describe major changes in ground water protection programs including legislative amendments and policy directives. USEPA also strongly re-emphasized the goal of reporting ground water quality for specific aquifers or hydrologic setting by the year 2006. ADEQ has sampled all major fresh-water aquifers as of the end of 2006, and begun reporting by individual aquifers within this report.

Because summarizing the assessment of the entire State's ground water resources on a biennial basis is such a large and time-consuming task, USEPA has recommended reporting only on changes since the last hard-copy report. As such, the following is a combination of data from the previous report and new information since the last publication. Updated information has been inserted on activities from the last quarter of FY05 through the end of State FY07 (June 30, 2007). Reports on activities prior to July 1, 2002, have been omitted. Due to the three year rotational period for the monitoring areas, and for completeness of major program changes in other areas in the last five years, the present report may include information also provided in the 2006 report.

Overview

Shallow fresh water aquifer systems are found throughout Arkansas and supply an abundance of high quality ground water for a wide range of uses including industrial, municipal, agricultural and domestic. Ground water is one of the most important sources of water in Arkansas and accounts for approximately 60 percent of the total water use in the State. Most all of the surficial aquifers supply water of good to very good quality, ranging from calcium bicarbonate to sodium bicarbonate water types. Areas of poor water quality can result from both natural and anthropogenic effects. Natural sources of contamination are typically regional in extent and related to water-rock interactions. Anthropogenic impacts are more localized and include point and nonpoint sources of contamination. Nonpoint sources can affect larger areas, although contaminant concentrations typically are significantly lower than those resulting from point sources, and the contaminants typically are soluble, non-reactive species. Point sources of contamination often result in elevated levels of contaminants which exceed federal maximum contaminant levels (MCLs); however, the extent of contamination normally is confined to a small area with little to no offsite migration or impact to receptors.

Water quality concerns resulting from natural water-rock interaction range from simple hardness issues related to high concentrations of dissolved calcium and magnesium to high concentrations of iron related to the dissolution of iron-oxide coatings from the aquifer sediments. Isolated areas of concern from natural sources include a large area of saltwater intrusion in Chicot County (southeast Arkansas), in which chloride concentrations range upwards to 1600 mg/L. Isolated areas of elevated chloride (100-300 mg/L) additionally are found in several locations throughout the Alluvial Aquifer in eastern Arkansas, although the sources are poorly understood at the present time. Elevated radon and fluoride values occur in isolated areas in some of the Paleozoic aquifer systems in north Arkansas. Elevated arsenic concentrations are found in the alluvial aquifer and range upwards to 70 µg/L. The arsenic concentrations exceed the MCL of 10 µg/L and appear to result from the reductive dissolution of iron oxides, which contain co-precipitated trace metals including arsenic. Elevated iron concentrations are ubiquitous throughout the alluvial aquifer in eastern Arkansas, and reach concentrations as high as 70 mg/L. Elevated iron concentrations do not present a health hazard, but do present problems related to both aesthetic concerns (staining, taste, etc.) and in industrial applications, where high-quality water is often required by various processes.

Nonpoint sources of contamination range from elevated nutrients and bacteria in shallow aquifers in northern Arkansas associated with increased animal production and septic systems, to low-level pesticide detections in eastern Arkansas, associated with row-crop agricultural practices. Pesticides are detected in approximately 30 percent of the total wells sampled by ADEQ in the shallow alluvial aquifer in eastern Arkansas; however, most concentrations range from 2-5 orders of magnitude below MCLs for the various pesticides detected through 2005. Point sources of contamination include landfills, underground storage tanks, leaking waste- and process-water holding lagoons, industrial facilities, military installations, and petroleum storage and transfer operations. Although these potential sources of contamination range upwards to greater than ten thousand occurrences for hazardous waste generators and underground storage tanks, documented instances of offsite migration of contaminants are probably less than one hundred. However, costs for procuring an alternate water supply for impacted users can exceed one million dollars, and total contamination remediation costs can exceed several million dollars at a single site. The cost of contamination prevention measures are far below the costs of remediation, thus the current focus of both federal and state regulators is in the area of contamination prevention and wellhead protection. A critical problem exists not only in protection of ground water quality, but additionally in the protection of diminishing ground water supplies in areas where agricultural, municipal, and industrial needs have placed unsustainable demands on the production capacities of certain aquifer systems.

Ground water in Arkansas occurs in two general geologic settings, represented by five major physiographic regions of the state: the Ozarks, the Arkansas River Valley, the Ouachita Mountains, the Gulf Coastal Plain, and the Mississippi Embayment. The aquifer systems in eastern Arkansas (Gulf Coastal Plain and the Mississippi Alluvial Valley) are dominantly represented by alternating sequences of gravel, sand, silt, and clay, which form both confining layers and aquifers. The main aquifer systems are located in the Quaternary deposits (the alluvial aquifer), the Cockfield Formation, the Sparta Formation, the Wilcox Group, the Nacatoch Sand, and the Tokio Formation (Table V-1). The Mississippi River

Valley alluvial aquifer and the Sparta aquifer are the most important aquifers in eastern Arkansas, together supplying more than 95 percent of the ground water used in this region of the State. The thickness of the alluvial aquifer ranges from approximately 50 to 150 feet, produces an average of 1600 gpm to irrigation wells, and is used mainly for irrigation. The Sparta is used mainly for municipal supply and industrial use, although declining levels in the alluvial aquifer in some areas have resulted in more frequent use of the Sparta aquifer for irrigation.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas (Table V-2). The Springfield Plateau aquifer is generally under unconfined conditions, with ground water movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases. The Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas constitute the only significant aquifer system in the Ozarks, and are used extensively for municipal supply systems, where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells.

Table V-1: Generalized Stratigraphic Column of the Gulf Coastal Plain of Southern and Eastern Arkansas (modified from Haley and Others, 1993).

ERA	SYSTEM	SERIES	GROUP	FORMATION
Cenozoic	Quaternary	Holocene & Pleistocene		Alluvium & Terrace Deposits *
	Tertiary	Eocene	Jackson	Undifferentiated
			Claiborne	Cockfield Formation *
				Cook Mountain Formation
				Sparta and Memphis Sand *
				Cane River Formation
				Carrizo Sand
			Wilcox	Undifferentiated *
		Paleocene	Midway	Undifferentiated
Mesozoic	Cretaceous	Upper Cretaceous		Arkadelphia Marl
				Nacatoch Sand *
				Tokio Formation *
				Undifferentiated
Paleozoic	Undifferentiated	Undifferentiated		Undifferentiated

(* denotes major aquifers)

Table V-2: Generalized Stratigraphic Units in Northern Arkansas with Corresponding Geohydrologic Units (modified from Imes and Emmett, 1994).

ERA	SYSTEM	FORMATION	GEOHYDROLOGIC UNIT	GEOHYDROLOGIC SYSTEM
Paleozoic	Pennsylvanian	Atoka Formation Bloyd Formation Hale Formation		Western Interior Plains Confining System
	Mississippian	Pitkin Limestone Fayetteville Shale Batesville Sandstone Moorefield Formation		
		Boone Formation St. Joe Limestone Member	Springfield Plateau Aquifer	Ozark Plateaus Aquifer System
		Chattanooga Shale	Ozark Confining Unit	
	Devonian	Clifty Limestone Penters Chert	Ozark Aquifer	
	Silurian	Lafferty Limestone St.Clair Limestone Brassfield Limestone		
	Ordovician	Cason Shale Fernvale Limestone Kimmswick Limestone Plattin Limestone Joachim Dolomite St. Peter Sandstone Everton Formation Smithville Formation Powell Dolomite Cotter Dolomite Jefferson City Dolomite Roubidoux Formation Gasconade Dolomite Van Buren Formation Gunter Sandstone Member		
	Cambrian	Eminence Dolomite Potosi Dolomite		
		Doe Run Dolomite Derby Dolomite Davis Formation	St. Francois Confining Unit	
		Bonneterre Dolomite Regan Sandstone Lamotte Sandstone	St. Francois Aquifer	

The Western Interior Highlands (Arkansas River Valley, Ouachita Mountains) are underlain by thick sequences of consolidated rocks of predominantly Paleozoic age consisting mostly of sandstones, shale, and novaculite (Table V-3). Ground water in these consolidated rocks occurs primarily in fractures and joints in the sandstones and shales, and is used both for domestic and municipal supplies. Wells throughout western Arkansas average about 150 feet in depth and normally produce less than 10 gpm.

In regard to water quantity issues in Arkansas, the greatest area of concern is the extensive use of the Alluvial Aquifer (primarily for irrigation purposes) and the Sparta Aquifer (primarily for municipal and industrial supply) in eastern Arkansas. While the Alluvial Aquifer and the Sparta Aquifer have historically provided abundant water, neither can sustain the current withdrawal rates indefinitely. Water levels in both aquifers have declined substantially across broad areas, and large cones of depression have developed in several regions. A cone of depression is a depression in a water table caused by a pumping well. As pumping continues over time, a cone of depression propagates outward and many individual cones of depression can coalesce into larger cones, eventually forming a single large cone of regional scale. If pumping from the Alluvial and Sparta Aquifers continues to exceed sustainable rates, water levels will continue to decline and eventually reach a level that water cannot be pumped at the rates needed to support all users.

Although the amount of water withdrawn annually from the Sparta Aquifer is much less than what is withdrawn from the alluvial aquifer, the coefficient of storage, (storativity) that defines the amount of water released from an aquifer per foot of drawdown is several orders of magnitude smaller than that of the Alluvial Aquifer; as a result, a much larger volume of the Sparta is affected in producing the same volume of water from the alluvial aquifer. Consequently, extensive water-level declines have been observed in the Sparta aquifer, and the development of large cones of depression indicate that water is being withdrawn from the Sparta at rates that are much greater than the rate at which water is being recharged to the aquifer. The Sparta Aquifer will not indefinitely sustain the current rates of withdrawals, and certainly will not be able to sustain the continued increase in withdrawal rates occurring in many areas. This growth in observed withdrawal rates will result in acceleration of water-level declines. The impact of increased pumping will be particularly pronounced in areas where high-volume, agricultural alluvial aquifer users are beginning to tap the Sparta as a supplemental source of water.

Table V-3: Generalized Stratigraphic Column of the Arkansas River Valley and Ouachita Mountain Region. (modified from Haley and Others, 1993)

<table>
<tr><th>ERA</th><th>SYSTEM</th><th>FORMATION</th></tr>
<tr><td>Cenozoic</td><td>Quaternary</td><td>Alluvium & Terrace Deposits</td></tr>
<tr><td rowspan="6">Paleozoic</td><td>Pennsylvanian</td><td>Boggy Formation
Savanna Formation
McAlester Formation
Hartshorne Sandstone
Atoka Formation
Johns Valley Shale
Jackfork Sandstone</td></tr>
<tr><td rowspan="2">Mississippian</td><td>Stanley Shale</td></tr>
<tr><td rowspan="2">Arkansas Novaculite</td></tr>
<tr><td>Devonian</td></tr>
<tr><td>Silurian</td><td>Missouri Mountain Shale
Blaylock Sandstone</td></tr>
<tr><td>Ordovician</td><td>Polk Creek Shale
Big Fork Chert
Womble Shale
Blakely Sandstone
Mazarn Shale
Crystal Mountain Sandstone
Collier Shale</td></tr>
</table>

CHAPTER ONE GROUND WATER PROTECTION PROGRAMS

There are two main components of ground water protection: 1) ensuring the available quantity necessary for the various uses, and; 2) protecting existing ground water quality. The protection mechanisms are addressed by multi-agency, multi-disciplie approaches due to the broad scope of both activities. Ground water restoration continues to demand a large portion of available resources in the form of remediation efforts, where protection mechanisms have failed or were not in place historically. Most of the remedial activities are the responsibility of divisions of ADEQ. ADEQ has been authorized by the USEPA to administer federal programs consistent with the Safe Drinking Water Act (SDWA), Resource Conservation Recovery Act (RCRA), and the Clean Water Act (CWA), among others.

The multi-agency approach to ground water protection has evolved over the last fifteen years. The number of joint state and federal ground water protection projects has increased. Current ground water protection activites take advantage of university resources in addtion to state and federal agencies.

Ground Water Availability and Use

Each year, over 6,600 million gallons per day (mgd) of ground water is pumped from the State's aquifers. The greatest volume (6318 mgd) is pumped from the Mississippi River Valley Alluvial Aquifer (Alluvial Aquifer), primarily for irrigation purposes. The next greatest is from the Sparta-Memphis Sand aquifer system (approximately 244 mgd),which is used for municipal, irrigation, and industrial purposes. Ground water use in Arkansas has increased by 74 percent since 1985, including a 400 percent increase in use from the alluvial aquifer in Arkansas County alone.

Increased demand on ground water has resulted in water-level declines and water quality degradation in many areas of the State. This prompted the passage of Act 154 of 1991, which identifies critical ground water areas in the State and authorizes regulation of usage. Classification of critical ground water areas is based on certain criteria, including water levels below the top of a given formation (confined aquifer), saturated thickness of the formation less than 50 percent of the total formation thickness (unconfined aquifer), water-level declines of more than one foot per year over a five year period, and trends indicating degradation of water quality (Natural Resources Commission (ANRC), 2007). Recent policy changes place an increased emphasis on the achievement of sustainable yield of all the State's aquifers. Determination of sustainable yield is established by the ANRC and has been a long-term project in cooperation with the Arkansas Water Science Center of the U.S. Geological Survey (USGS) in Little Rock.

In 1995, the Sparta aquifer was designated as a critical ground water area by the ANRC in south Arkansas in a five-county area (Ouachita, Calhoun, Bradley, Columbia, and Union). In 1998, the ANRC designated an area encompassing Jefferson, Arkansas, Prairie, Lonoke and parts of Pulaski and White counties as a critical ground water area for the alluvial and Sparta aquifers. Priority study areas for present and future analyses include the alluvial and Sparta aquifers in parts of northeastern and southeastern Arkansas, including the Cache and St. Francis study areas in northeast Arkansas and the Boeuf-Tensas study area in southeast Arkansas.

Information used to evaluate water-level trends from the various aquifers are based on a water-level monitoring measurement network maintained under cooperative agreements between the ANRC, USGS, the Arkansas Geological Commission, and the Natural Resources Conservation Service (NRCS). Through these cooperative agreements, over 1500 measurements are collected annually. Trends in water-level changes are monitored by the ANRC for use in evaluating potential critical use areas within the State.

Water use registration for all wells capable of producing 50,000 gallons per day has been required since 1985, along with an annual water use registration fee. Arkansas Act 1426 was promulgated in 2001 for the purpose of requiring a properly functioning metering device for any well constructed after September 30, 2001, which withdraws ground water from a sustaining aquifer. The act further stipulates that after September 30, 2006, all wells withdrawing ground water from a sustaining aquifer shall have a properly functioning meter. Sustaining aquifers include the Sparta, Memphis, Cockfield, Cane River, Carrizo, Wilcox, Nacatoch, Roubidoux, and the Gunter Aquifers. The Alluvial Aquifer is not considered a sustaining aquifer, and domestic wells are specifically exempt from the metering requirement.

The ANRC is considering formal recommendation of sustainable yield for the Sparta/Memphis Aquifer in eastern and southern Arkansas. This process will build on the ground water flow model sustainable yield estimates produced through a cooperative effort with the USGS Water Science Center in Little Rock.

Ground Water Quality Protection and Restoration

There are many ground water protection programs within the State that include both regulatory and voluntary ground water contamination prevention activities. These programs include prevention of contamination from both point sources and nonpoint sources. The point-source prevention programs are almost entirely regulatory programs and are administered by ADEQ (indicated by ADEQ next to the headings which follow), while the majority of nonpoint sources are related to agriculture and other land-use activities and commonly include joint efforts by several agencies.

Act 472 of 1949 designates ADEQ as the lead authority for development and implementation of ground water quality standards. As part of ADEQ's 10-year Strategic Plan, the Department has committed to the development of state-promulgated ground water standards for protection of the State's aquifers. A ground water task force was assembled with members from all the divisions of ADEQ charged with protection of ground water. Water Division staff are currently reviewing an updated library of other states' ground water standards that were first compiled in 1990 and 1991. Together with a review of standards from other states and discussions with ground water personnel from other states, ADEQ intends to draft a set of standards that will fully protect Arkansas's ground water resources.

Regulated Storage Tank Division (ADEQ)

The Regulated Storage Tanks (RST) Division at ADEQ has program responsibility for implementing the federal underground storage tank (UST) program in Arkansas and for the cleanup of both UST and aboveground storage tank releases from Part 112 ASTs.

During this reporting period, the RST Division has experienced significant developments including:

> The Energy Policy Act of 2005 has had a significant impact on several RST programs. In addition to beginning the first 3-year inspection cycle on UST facilities, new or replaced tanks and piping are now required to have secondary containment for enhanced ground water protection; tank operators will receive training/certification; and noncompliant tank systems will be prohibited from receiving delivery of regulated substances. Available program funding may be applied more flexibly to include release prevention activities as well as cleanups of petroleum releases.
>
> Claims for cleanup and third-party damages against the Arkansas Petroleum Storage Tank Trust Fund continue to increase. In October 2005, the Petroleum Environmental Assurance Fee was increased to 3/10ths of one cent per gallon of motor fuel or distillate special fuel purchased or imported into the State in order to help ensure the fund stays financially sound.
>
> The storage tank installed inventory has shown a slight decline commensurate with the economic conditions of the past year. As of November 20, 2007, there were 13,233 regulated storage tanks located at 5,247 facilities across the State.
>
> The pollution prevention aspects of the federal UST program are demonstrating some level of success. The number of confirmed releases peaked in the third quarter of 2001, and has been slowly declining since that time with a compliance average of 65 percent as of October 2007.

Perhaps most significantly during the reporting period, the RST Division was the first state UST program in Region VI to successfully negotiate an inter-agency Memorandum of Agreement for Source Water Protection (in conjunction with the Arkansas Department of Health), following a national USEPA cooperative initiative.

Underground Injection Control Program (ADEQ)

The Underground Injection Control Program (UIC) regulates the disposal of waste waters into appropriate underground reservoirs under the authority of Part C of the federal Safe Drinking Water Act (SDWA). Congress passed the SDWA in 1974, requiring the USEPA to establish a system of regulations for injection activities. The regulations are designed to establish minimum requirements for controlling all injection activities, to provide mechanisms for implementation and authorization of enforcement authority, and to provide protection of underground sources of drinking water (USDW).

Arkansas was given authority to administer the UIC program as a primacy state in 1982 and is 75 percent funded by a grant from USEPA. This primacy authority (primary enforcement authority) allows ADEQ to regulate Class I, Class III, Class IV, and Class V wells. The Arkansas Oil and Gas Commission (AOGC) regulate the Class II and Class V bromine-related, spent-brine disposal wells. Protecting USDWs is accomplished through the issuance of permits, inspections, annual testing, continuous monitoring, and enforcement of the regulations in 40 CFR Parts 124, 144, and 146.

There are 13 active Class I injection wells permitted in the State. There are two hazardous and six non-hazardous waste injection wells currently in operation. Five of the Class I wells are “shut-in” or temporarily abandoned and not currently injecting. These wells inject into underground, saline-filled formations at depths ranging from 2500’ to 8700’ below ground surface. In December 2003 one hazardous waste injection well was plugged and abandoned, in July 2005 one non-hazardous waste injection well was plugged and abandoned, and in June 2006 two hazardous waste injection wells were plugged and abandoned. No significant noncompliance or similar violations occurred. A work-over to replace tubing and packers was completed on one non-hazardous well in September 2005. All wells passed their annual mechanical integrity testing (MIT) requirements. Permit renewal applications were received for eight of the wells. One non-hazardous waste injection well was drilled at the Albemarle West Plant by the Dow Chemical Corporation in May 2006. This well is currently shut in as Dow is awaiting USEPA approval of a no-migration petition as part of the application to convert the well from a non-hazardous waste disposal well to a hazardous waste disposal well.

ADEQ completed program revisions to comply with Federal Rule revisions effective April 5, 2000, that addressed Class V wells. Regulation No. 17 was adopted by the Pollution Control and Ecology Commission in February 2005, and program revision documents were submitted to USEPA Region 6 in May 2005, with final revisions submitted in August 2005. The revisions added requirements for two sub-categories of Class V wells, large-capacity cesspools and motor-vehicle waste disposal wells, linked the Class V program to the source water assessment program and added new definitions. These well types were already regulated under existing Arkansas state laws and were previously subject to closure.

Solid Waste Management Division (ADEQ)

Municipal solid waste landfills, industrial landfills, transfer stations, waste-tire collection facilities, composting facilities and material recycling centers, which are properly designed, managed and adequately financed, all provide Arkansans environmentally safe options for solid waste collection and disposal. The Solid Waste Management Division (SWMD) Recycling Branch continues to work with potential waste stream users to identify and provide beneficial end uses for all types of waste streams (metals, glass, wood, paper, rubber, and plastics). These efforts facilitate reductions in waste stream volumes transported to and disposed in Arkansas’s landfills. As population numbers increase statewide, it will become increasingly difficult for solid waste companies to permit new or expand existing solid waste disposal facilities. Consequently, waste stream reduction via recycling becomes increasingly important in extending the life of existing permitted disposal facilities. The SWMD continues to provide education, funding, and technical assistance to communities, businesses, and individuals for waste reduction, recycling, and development of viable markets for recycled materials.

SWMD staff in 2005 successfully completed the implementation of necessary revisions to Regulation 22. There had been no previous revisions or updates since its adoption in April 1995. As a result, many statutory and legislative changes had been made which necessitated changes to Regulation 22. As a result of the current revisions, Regulation 22 is more concise, comprehensive and easier to understand by the regulated community.

SWMD staff continues to oversee implementation of Regulation 22 solid waste management rules. This regulation governs the State's municipal, industrial, and commercial solid waste programs and was established to protect human health and the environment. SWMD staff work with new and expanding landfill facilities to ensure specific requirements of State regulations are met for location, site specific criteria, design, and ground water monitoring. Regulation 22 covers four basic areas with regards to the protection of ground water:

- Location restrictions that limit the placement of landfills in wetlands or floodplains.

- Minimum design criteria dependent upon the class of landfill and lateral expansion may include a composite liner, leachate collection system, leak detection system, and/or gas extraction system.

- Site specific criteria based on the geology of the area. Minimum design criteria are more restrictive in a karst geological setting to ensure ground water protection due to the inherent environmental sensitivity of carbonate rocks.

- Class 1 and Class 3 facilities must install a monitoring system to detect ground water contamination. Sampling and analysis must be at regular intervals throughout the active phase and through the closure phase. A facility may be placed into corrective action if levels of contaminants exceed federal limits for safe drinking water standards. In 2007, 2 out of 42 facilities were in a corrective action program.

In 2004, ADEQ received Supplemental Environmental Projects (SEP) monies in response to an enforcement action undertaken by ADEQ against a landfill operator in northwest Arkansas. The monies were allocated for the implementation of a Water Quality Inventory in watershed basins in Washington and Benton Counties. The study is currently ongoing and will eventually provide surface and ground water quality information, a delineation of area watershed basins, a spring inventory, and other useful water quality information from the area. The investigation is directed by Dr. Ralph Davis and Dr. Van Brahana of the University of Arkansas at Fayetteville. ADEQ is providing laboratory services for water quality analysis. Once completed, SWMD Technical Branch staff and the researchers will review the findings and interpret the results of the investigation. The information will hopefully allow ADEQ staff and other interested parties to better understand the hydrogeologic framework of the area and better track potential sources of contamination in these watershed basins.

In 2007, Post-Closure Trust Fund monies were used to further characterize two landfills in northwestern Arkansas that were closed prior to current landfill standards: C & L Landfill and Parson's Landfill. Both landfills are located in Washington County, C & L Landfill is south of Fayetteville, while Parson's Landfill is east of Springdale. The characterization included sampling of ground water, leachate, surface water, and landfill gas at the landfills to determine current conditions. Final site assessment and decision on additional closure activities for each site will be made based on sampling and characterization results.

Hazardous Waste Division (ADEQ)

The following items are regulatory or policy changes that may impact sites within the State requiring ground water monitoring, ground water investigations, and ground water remediation under ADEQ Hazardous Waste Program.

Regulation No. 23

Regulation No. 23, Hazardous Waste Management, was updated on December 9, 2005, to include revisions to monitoring and testing standards, and became effective on March 22, 2006. This revision will allow the use of alternative test methods to those required by SW 846 as long as the alternate test methods meet the required data quality objectives.

Regulation No. 29

Regulation No. 29, Arkansas Brownfields Redevelopment, was updated on December 9, 2005, to include residential sites as eligible sites for redevelopment under the Brownfields Redevelopment Program. The regulation became effective on March 3, 2006.

Regulation No. 30

Regulation No. 30, The Arkansas Remedial Action Trust Fund Hazardous Substance Site Priority List, was last updated on October 28, 2005. Seven sites were added to the investigation category and one site was added to the remediation category.

Investigation Category

- Fashion Park Cleaners, Little Rock
- Tankersley/White Dairy, Ft. Smith
- Huntco/Jms, Hickman
- I Can Inc., Lonoke
- I. Easter Property, Pine Bluff
- Hadco, Gillham
- Butler Elementary School, Madison
- General Dynamics Corporation, East Camden

Remediation Category

- General Dynamics Corporation, East Camden

This list will be updated during the next legislative session.

Regulation No. 32

Act 2141 was superseded by Act 1018 which created a mechanism for ADEQ to keep and publish a list of qualified environmental professionals.

Regulation 32 will be amended to establish cleanup standards for clandestine drug laboratories by the spring of 2008.

ADEQ Ground Water Remediation Level Interim Policy and Technical Guidance

ADEQ has developed an interim Policy for the establishment of ground water remediation requirements for contaminated sites. This policy will apply to Divisions responsible for the oversight of ground water remediation within the department. The purpose of this policy is to establish consistent methods for establishing ground water remediation levels regardless of the media Division having principal responsibility for the action.

Until a final regulation is promulgated by the Arkansas Pollution Control and Ecology Commission that are specific to the establishment of ground water remediation levels, such levels will be established on a case-by-case basis.

Elective Site Cleanup Program

ADEQ administers an Elective Site Cleanup Program that allows responsible parties to enter into an agreement with ADEQ to govern the cleanup of sites. The Elective Site Cleanup Program does not offer a release of liability but does offer participants a means to address historic contamination on their site without penalty and with known objectives. ADEQ is working to promote the Elective Site Cleanup Program in order to maximize cleanups of sites within the State.

Ground Water Contamination Prevention Programs

Although the objectives of all ground water protection programs are to protect and preserve ground water quality, early legislation primarily was based on problematic, known sources of contamination and response to contamination events. The problems of technical-feasibility constraints and the large costs associated with cleanup activities mandated a new approach for preventing ground water contamination. New regulatory programs focused on stricter controls aimed at preventing releases from regulated facilities. Throughout the 1990s, there has been an increasing amount of effort and funds expended toward voluntary programs, which strive to protect existing ground water quality through outreach and assistance programs.

Wellhead Protection Program (Arkansas Department of Health)

The Arkansas Wellhead Protection Program (WHPP) is designed to prevent contamination of underground sources of water used by Public Water Suppliers (PWS). The WHPP was authorized in the 1986 Amendments to the federal SDWA and was assigned to the Arkansas Department of Health (ADH). Wellhead Protection is a voluntary program that is developed by Public Water Systems and local communities with technical assistance and guidance provided by ADH. A WHPP minimizes the potential for contamination by: 1) identifying the probable area that contributes water to municipal water supply wells and; 2) implementing measures within the Wellhead Protection Area (WHPA) that will help avoid costly ground water cleanup or development of alternative water supplies.

The program is administered according to three main program elements: 1) delineating a WHPA for each well or wellhead; 2) identifying all potential man-made sources of contaminants injurious to public health within each WHP area; and 3) developing strategies and means to manage the WHPA so as to protect the ground water resource from contamination. The more successful WHP Programs integrate outreach activities to increase public awareness and coordinate local pollution prevention efforts with existing programs. Assistance in targeting local contacts and citizens groups is provided to public water systems, local officials, and utilities during development and implementation of a WHPP. Emphasis is placed on public participation and control, to establish local solutions to local problems.

An ongoing goal of the program is integration of the WHPP and the Source Water Assessment and Protection program (SWAP), a similar program authorized in the 1996 amendments to the SDWA and completed in 2003. The SWAP entailed assessment of all sources of Public Water Supply (surface water supplies as well as ground water sources) for their vulnerability to contamination. The SWAP was partly modeled after the WHPP and extended its emphasis on contamination prevention to all drinking water sources. The SWAP reports sent to each PWS were intended to serve as the basis for protection planning efforts. In keeping with long-term planning goals and guidance from USEPA, Arkansas has been combining the functions of the WHPP and SWAP programs where appropriate, since the two programs share many of the same objectives and techniques.

One source water protection activity coordinated by the Arkansas source protection program is technical review and comment on permitting actions of other agencies and organizations to assess potential adverse effects on drinking water sources. This process, intended mainly to protect surface water sources, results in the review and tracking of Oil and Gas drilling permits, NPDES permits, and land application permits. Approximately 500 NPDES permits are reviewed each year and over 800 Oil and Gas permits are reviewed per year. Oil and Gas permit reviews increased substantially in the past several years as a result of recent activity in the Fayetteville Shale gas play.

Technical assistance with proper siting and design of public water supply wells is another important mandate of the WHPP. Wellhead Protection staff geologists review over 40 proposed well designs and analyze drill cuttings for about 20 wells each year and produce detailed construction recommendations and maps for district staff use for each proposal.

During the past year a Source Water Protection Survey (survey) was developed to assess the progress and current implementation of the WHPP and SWAP programs. A total of 451 surveys were provided to all active Community PWS in March of 2007. Presently a total of 208 (46%) of the systems have responded to the survey. The survey is intended to be used as a tool to determine the needs of each PWS in regards to their drinking water protection programs, determine what the PWS considered as the most prevalent and most threatening contaminant sources, and develop programs to assist the PWS in source protection activities. The information is currently being compiled and evaluated by ADH staff to determine current needs of each program and develop strategies to further assist PWS in source water protection efforts.

Compiling and maintaining a database of well information and other data has long been an integral part of the program, which supports various aspects of the Health Division’s Public Water Supply Supervision Program. Comprehensive hydrologic information is presently available for over 920 public water supply wells in the State. This data is often used by other agencies and organizations as well.

Water Well Construction Commission

Act 641 of 1969 created the Arkansas Water Well Construction Commission (AWWCC), which provides for the proper development of ground water in an orderly, sanitary, and safe manner. Standards ensure proper well-construction and pump-installation procedures. Administration of the licensing and registration of drillers and pump installers, as well as technical assistance, has been provided by the ANRC since 1995, and includes full-time field inspectors, management, and technical-support personnel. Act 297 of 2003 (SB 241) authorizes the AWWCC to develop an apprenticeship program for drillers and pump installers and adds a continuing education requirement for drillers and pump installers. It ties the AWWCC's ability to seek criminal penalties into the criminal justice system, so that assisting law enforcement officers and judicial personnel can draw upon pre-existing knowledge of Class A misdemeanor, Class B misdemeanor, and Class D felony. It increases the amount of civil penalties the Commission may seek from $500 to $2,500. It requires contractors to obtain a bond of $10,000 rather than $2,000 to protect consumers. This act contained an emergency clause making it effective July 1, 2003.

Several part-time employees assist in water-well construction report data entry into a data base, which includes information on well construction. The data base contains information such as well-construction details, depth to static water level and water-producing formations, well yield, pump-setting information, and the geologic setting of each well, and has recently been linked to the USGS water use database.

Act 855 of 2003 (SB 702) provides a means of holding persons who violate Arkansas law regarding water well construction accountable for their actions. It requires proper training and licensing for water well construction, and specifies minimum bond amounts to protect well owners. Water well contractors who continuously violate Arkansas law requiring proper registration and training will find their property subject to forfeiture. The act authorizes law enforcement agencies to forfeit property and provides a forfeiture process to be followed by the prosecuting attorney. If it cannot be shown why the subject property should not be confiscated, it will be disposed of at public auction to the highest bidder. Sale proceeds and other monies forfeited shall be applied to entities in the order listed. This act became effective March 31, 2003.

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CHAPTER TWO GROUND WATER QUALITY MONITORING

Ground water quality monitoring is performed on many levels including ongoing ambient monitoring, short-term, research-oriented monitoring, and mandated monitoring at regulated sites. The availability of the resulting data is thus dependent on the monitoring goals, and ranges from hard-copy format in the form of reports and/or journal articles to publicly-accessible, computer storage formats such as the USEPA's STORET data base. Comparison of data from the various sources is difficult because of the differences in parameter lists, laboratory instrumentation and methods, and reporting criteria.

Ambient Ground Water Quality Monitoring

Ongoing ambient monitoring is performed primarily by two organizations, ADEQ and USGS, and occurs at numerous ADEQ-regulated facilities within the State. The purpose of the monitoring is to evaluate potential and actual anthropogenic impacts, the data may be questionable for use as natural or background quality information, and the parameter list often includes a limited set of constituents. In the absence of other data, monitoring results from these sites, especially from background wells, can be a valuable source of information.

Monitoring of public water-supply wells by the ADH also provides another source of data. The ADH is the primacy agency for the federal SDWA. The ADH monitors approximately 1200 wells every three years for inorganic, organic (including pesticide, herbicide, SOCs, VOCs, etc.), and radiochemical contaminants, with the exception of the Total Coliform Rule that requires sampling on a monthly basis, with the number of samples dependent on the size of population. Nitrate monitoring is conducted on a yearly basis unless a sample greater than or equal to 50 percent of the MCL triggers the need for increased frequency. In addition, the Disinfection Byproduct Rule requires monitoring for trihalomethanes and haloacetic acids, byproducts of the disinfection process, on a quarterly or annual basis, with the number of samples dependent on the type of source and population served by the system. However, the data is limited to the required list of analytes. Also disinfection, among other processes performed on finished water, can alter the original chemical composition.

Raw-water sampling is conducted under existing SDWA rules. Raw-water sampling has been implemented in order to detect microbial contaminants for ground water wells that may be directly influenced by surface water (Surface Water Treatment Rule); this sampling includes weekly raw-water bacteriological testing, and may include temperature measurements and Microscopic Particulate Analysis to detect insects or other microorganisms, algae, organic debris, or large diameter pathogens. Raw-water sampling for *E. coli* has been implemented on a monthly basis for at least 12 months to establish baseline conditions for selected wells in hydrologically-sensitive aquifers which may be at risk from sources of viral contamination (Ground Water Rule). Raw-water sampling has been implemented for surface water sources and wells that have been determined to be directly influenced by surface water and are at risk of contamination with surface water pathogens (Long Term 2 Enhanced Surface Water Treatment Rule). This sampling will include monthly analysis of raw water for *E. coli* and/or cryptosporidium oocysts. Finally, monthly raw water sampling for TOC has been implemented for certain surface water sources (Disinfection Byproduct Rule).

United States Geological Survey

USGS has 25 master wells scattered throughout the State, and these wells are sampled regularly every five years. Many other wells are utilized by USGS for water-quality sampling, but are sampled for special investigations and do not provide long-term data for trend analyses. Most of the data derived from water-quality investigations are presented in reports, which are easily obtainable at the local or national level or online at http://ar.water.usgs.gov/; data also are available in downloadable tabular or graphic format on the USGS NWISWeb, see http://waterdata.usgs.gov/ar/nwis/gw/. The USGS, in cooperation with the ANRC, additionally monitors 100 wells in the Sparta aquifer and 100 wells in the alluvial aquifer for chloride and conductivity on a 3-year rotational basis; and 50 wells in both the Sparta and alluvial aquifers for conductivity on a 1-year rotational basis. Although limited in the number of constituents, the relatively large number of wells provides a means of documenting general water-quality trends over time, through the plotting and comparison of isopleth maps and the use of statistical programs.

Short-Term Water Quality Monitoring (Special Investigations)

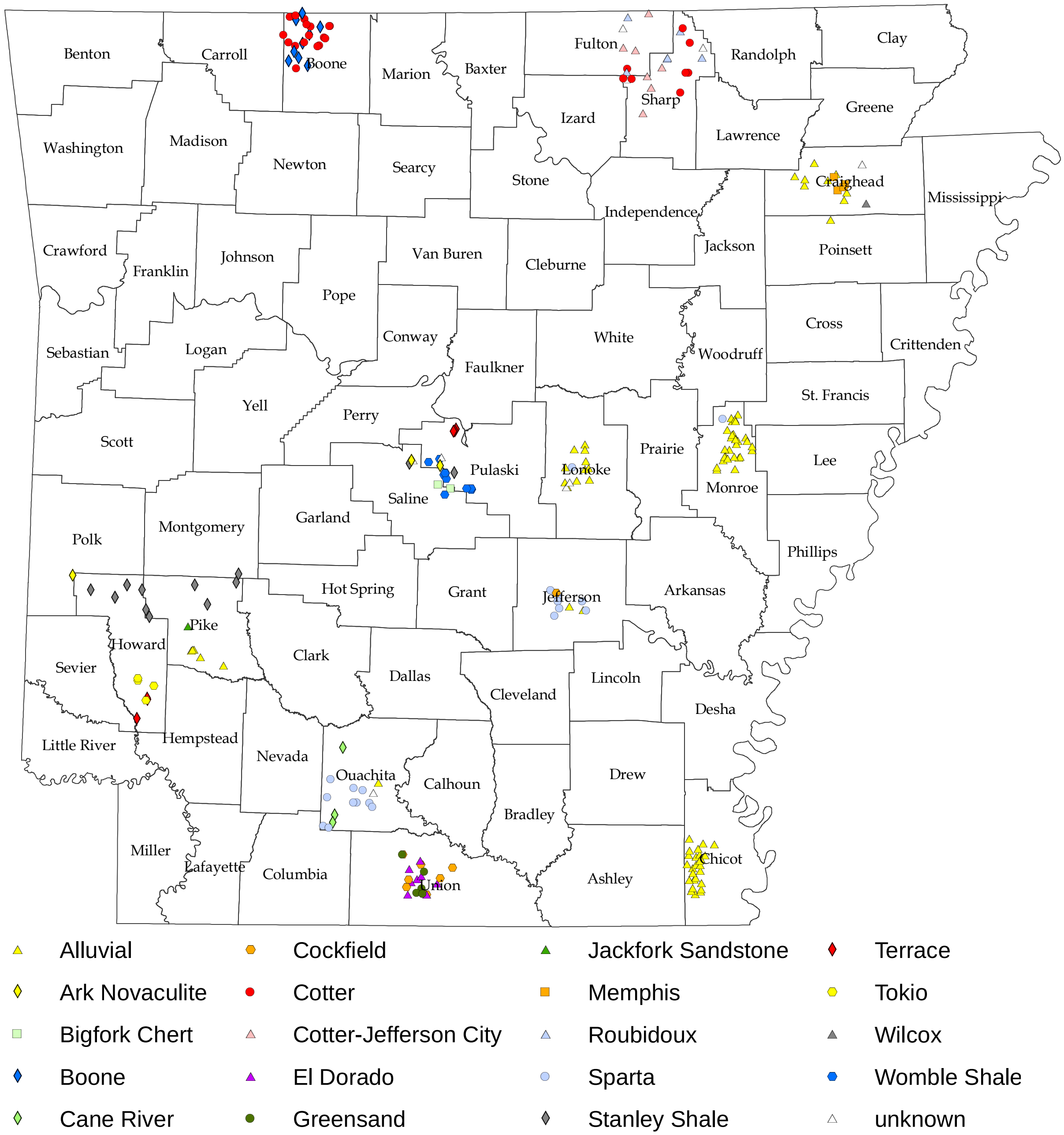
An extensive ground water quality data base has been developed as a result of numerous investigations primarily by the U of A at Fayetteville, USGS, and ADEQ. However, most of this information is available by hard-copy only in the form of reports and publications. A search of the list of publications for all organizations will reveal numerous ground water investigative reports for different areas of the State. These investigations are a valuable source of ground water quality data. However, similar caveats apply to the quality of the data as discussed above concerning data from regulated sites, in that some of these investigations may be performed at sites with known sources of contamination and do not necessarily represent ambient or background water quality.

Arkansas Department of Environmental Quality

The Arkansas Ambient Ground Water Monitoring Program (Program) was begun in 1986 to monitor overall ground water quality in the State. The program, originally called the Arkansas Prototype Monitoring Program, was renamed to better describe the program activities. The program currently consists of ten monitoring areas throughout Arkansas (Figure V-1). The monitoring areas were selected to gather water-quality data from various aquifers in select, representative areas of the State and to evaluate potential impacts from multiple land uses. The monitoring areas are sampled on an approximate three-year basis.

The monitoring areas are affected by agricultural, industrial practices or a combination of both sources. Potential impacts from anthropogenic sources include organic and inorganic compounds. In addition, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA - Superfund) facilities, RCRA facilities, MSW landfills, and underground storage tank sites potentially threaten or have adversely affected ground water in the monitoring areas.

Figure V-1: Arkansas's Groundwater Monitoring Wells



Because of the various potential sources of contamination among the different monitoring areas and the costs and time associated with laboratory analysis, each area has a specific parameter list to best evaluate water quality. All of the monitoring areas include field analysis of pH, conductivity, and temperature; laboratory analysis of nutrients, major cations and anions, total dissolved solids (TDS), and trace metals. Ground water samples obtained from areas potentially impacted by industry are analyzed for volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC). Ground water samples obtained from areas potentially impacted by agricultural activities are analyzed for pesticides. The current and proposed monitoring areas are described individually below.

Athens Piedmont Plateau/Gulf Coastal Plain Monitoring Area

The Athens Piedmont Plateau/Gulf Coastal Plain Monitoring Area in southwest Arkansas includes Paleozoic rocks of the Ouachita Mountains physiographic province and Cretaceous rocks and Quaternary deposits of the Gulf Coastal Plain physiographic province. The Paleozoic and Cretaceous aquifers within these provinces are new additions to the ground water monitoring network. Addition of this monitoring area serves to expand the knowledge of baseline ground water quality in this area and determine the potential impacts of the agricultural industry to ground water. The agricultural industry in this region includes extensive swine, poultry, and cattle operations. Currently, the monitoring area includes Howard and Pike counties and was first sampled in 2004. A total of 25 wells and one spring were sampled during the initial sampling event.

The samples from the northern part of the study area along the southern margin of the Ouachita Mountains were obtained from wells in the Devonian to Pennsylvanian Arkansas Novaculite, Stanley Shale, and Jackfork Sandstone. Samples taken in the southern part of the study area within the northern part of the Gulf Coastal Plain were obtained from the Cretaceous Tokio Formation and Quaternary (Pleistocene and Holocene) deposits comprising the alluvial aquifer. The majority of municipalities within the two county area derive their drinking water from surface sources, thus few municipal wells are available for sampling. However, many domestic and livestock wells exist that will enable future sampling from additional Cretaceous formations within the study area. Information related to the sampling sites and their locations is presented in Table B-19 in Appendix B.

Water quality in the study area is generally good. One of twenty-six samples, from a shallow well in the Stanley Shale, exceeded the MCL for nitrate-nitrogen (10 mg/L) at 14 mg/L, while the concentrations in the remainder of the samples were well below 1.0 mg/L. Chloride concentrations were notably highest in the Alluvial Aquifer, particularly the Holocene sediments, and ranged from 30.9 to 385.0 mg/L in four of the five samples from this interval. Three samples exceeded the secondary maximum contaminant level (SMCL) for iron (0.3 mg/L), and iron concentrations ranged from 0.0157 to 4.04 mg/L. SMCLs are unenforceable federal guidelines regarding taste, odor, color, and other aesthetic (cosmetic) characteristics of drinking water. Eleven samples exceeded the SMCL for manganese (0.05 mg/L). Manganese was detected in 23 samples and concentrations ranged from 0.00214 to 1.59 mg/L. Seven of eight of these detections were in samples derived from the Stanley Shale. TDS concentrations exceeded the suggested SMCL of 500 mg/L in two of the twenty-six samples. Arsenic was detected in four samples at concentrations ranging from 1.03 to

3.91 µg/L; however, these concentrations are well below the MCL for arsenic of 10 µg/L. Three of the arsenic detections were from the Alluvial Aquifer. Selected descriptive statistics are presented in Table B-20 in Appendix B.

Brinkley Monitoring Area

The Brinkley Monitoring Area encompasses the town of Brinkley and surrounding areas in northern Monroe County. It is located within the Mississippi Embayment physiographic province. The alluvial and Sparta aquifers provide 100 percent of community water needs. The primary uses are for drinking water and crop irrigation. Monitoring in this area was initiated during FY89 because of elevated chloride levels and potential impacts from pesticides to the alluvial aquifer. A total of 29 ground water wells, 28 from the Alluvial Aquifer and 1 from the Sparta Aquifer, were sampled during the most recent sampling event in June 2005.

Chloride levels ranged from 14 to 535 mg/L, and 7 of the 28 wells exceeded the 250 mg/L SMCL. Iron concentrations exceeded the SMCL of 0.3 mg/L in 26 of 29 samples, and manganese concentrations exceeded the SMCL of 0.05 mg/L in 27 of 29 samples. TDS concentrations exceeded the SMCL of 500 mg/L for TDS in 22 of the 29 samples. Arsenic was detected in 11 of the 29 samples at concentrations ranging from 0.55 to 21.5 µg/L, however, only 1 sample exceeded the MCL for arsenic of 10 µg/L. This well is used for irrigation purposes only and is not used as a source of drinking water. Pesticide analyses were last performed on 12 of the irrigation well samples in FY98. At that time, bentazon was detected in three of the samples and was the only pesticide detected in the pesticide scan. Information related to the wells and a summary of analyses are presented in Tables B-1 and B-2 in Appendix B.

Chicot Monitoring Area

The Chicot Monitoring Area is located west and south of the town of Lake Village in Chicot County, and is also in the Mississippi Embayment physiographic province. The Alluvial Aquifer is the only actively-used water source and is used for crop irrigation, fish farming, and municipal drinking water. In addition to potential impacts from pesticides, a zone of high chloride exists in western Chicot County. Although the high chloride water appears to benefit fish farming, it is detrimental to crops. Ground water monitoring in the Chicot monitoring area began during the third quarter of FY90 and originally consisted of 10 wells.

The number of sampled wells was increased during the fourth quarter of FY97 to 26 wells to better evaluate general water quality and the potential for expansion of the zone of elevated chloride concentrations. A summary of the sampling sites and their locations is in Table B-3 in Appendix B of this report. Chloride was detected in 21 of 26 wells at concentrations at or above the recommended SMCL of 250 mg/L. Iron was detected in 24 of 26 wells above the recommended SMCL of 0.3 mg/L. Measured TDS was above the recommended SMCL of 500 mg/L in 24 of 26 wells. Manganese was detected in 24 of 26 wells above the recommended SMCL of 0.05 mg/L. Selected descriptive statistics are listed in Table B-4 in Appendix B of this report. In addition to the routine analyses, pesticide analysis was conducted on selected samples that were adjacent to active crop-growing areas. Bentazon and p-p'-DDT were detected in two different wells at levels below their Heath Advisory

Levels (HALs). The HAL concentration of a chemical in drinking water is a value that, based on the available data, is virtually certain not to cause adverse human health effects if consumed over a lifetime.

An extensive investigation was initiated in the spring of 2000 to evaluate the source and extent of saltwater intrusion in Chicot County, Arkansas. A general background and problem statement detailing past studies and preliminary findings is located in Kresse, et al. (2000). By the start of 2003, 249 wells had been sampled in Chicot County, including 217 wells in the Alluvial Aquifer, 27 wells in the Cockfield Formation, 4 wells in the Sparta Aquifer and 1 well in the Wilcox Formation. Five monitoring wells were drilled and completed in the Cockfield Formation and one monitoring well was completed in the Sparta aquifer during the spring and summer of 2000. Personnel from the USGS provided electrical logs of the borings during the drilling operation. Analyses performed on the alluvial wells included chloride, bromide, fluoride, and sulfate in addition to field measurements of pH, temperature, and electrical conductance. All other well samples were analyzed for a complete set of analyses including nutrients, major cations and anions, total dissolved solids, and trace metals.

In early spring of 2002, prior to the irrigation season, water levels were measured in 100 alluvial wells to determine depth to water and ground water flow directions. Water-level measurements demonstrate a downward component of flow from shallow to deep for all three aquifer systems. A report summarizing these findings has yet to be published.

El Dorado Monitoring Area

The El Dorado Monitoring Area includes the town of El Dorado and surrounding areas in central Union County and is located in the Gulf Coastal Plain physiographic province. Three aquifers, the Cockfield, Upper Sparta (Greensand), and Lower Sparta (El Dorado), are sampled in this area. The Cockfield Aquifer is used primarily as a domestic drinking water supply, and the Greensand Aquifer is used for domestic and industrial purposes. The El Dorado Aquifer is used for industrial and municipal purposes. The El Dorado area is highly industrialized, primarily oil and gas production and bromine extraction from oilfield brines, as well as light manufacturing and food processing. Several national and international corporations have bromine production and refining plants in the area. Potential threats to ground water, particularly the shallow Cockfield Aquifer, are numerous. Ground water monitoring in the El Dorado Monitoring Area began in the first quarter of FY87 with the most recent sampling event conducted during the fourth quarter of FY04.

Ground water samples were obtained from eleven wells in the El Dorado Aquifer, five wells in the Greensand Aquifer and eight wells in the Cockfield Aquifer. In addition to the routine parameters, the samples from the Cockfield aquifer were analyzed for VOCs, SVOCs, pesticides, and PCBs. A summary of the sampling sites and their locations is presented in Table B-5 in Appendix B of this report. Overall ground water quality of all three aquifers is good. Iron was detected in 4 of 24 wells above the recommended SMCL of 0.3 mg/L and manganese was detected in 3 of 24 wells above the recommended SMCL of 0.05 mg/L. Selected descriptive statistics are presented in Table B-6 in Appendix B of this report. The only VOC detection was in sample UNI094, which had a chloroform concentration of 0.707

μg/L, probably the result of reaction of chlorine with dissolved and suspended organic carbon compounds in the water. The well owner, on the advice of a friend, had placed a large dose of household bleach into the well several months prior to the sampling date, and reportedly performs this disinfection technique twice a year. The resident is presently using municipal water for drinking purposes, and uses the well for watering purposes only. The SVOC di-n-butyl-phthalate was detected in each of the Cockfield wells at concentrations ranging from 1.28 μg/L to 3.75 μg/L. Di-n-butyl-phthalate is a manufactured chemical that is added to plastics, paint, glue, hair spray, and other household products. It is commonly found in the environment and no harmful effects have been found in humans. Pesticides and PCBs were not detected.

Hardy Monitoring Area

The Hardy Monitoring Area is located in northeast Arkansas in Sharp and Fulton counties. The area was first sampled in May 1998, and the FY05 sampling event included two springs and 24 wells ranging in depth from 120 to 1590 feet. Table B-7 in Appendix B contains locations and well depths for all wells. The area was originally chosen because of the lack of water quality data from the Lower Ordovician aquifers along the eastern end of the Ozark Plateaus physiographic province. The wells produce water from various formations including the Cotter and Jefferson City Dolomites, the Roubidoux Formation, and the Gunter Sandstone Member of the Gasconade Formation.

The water type is calcium plus magnesium bicarbonate, in which concentrations of magnesium and calcium, expressed as equivalent weights, are approximately equal in virtually every well-water sample. Sodium concentrations were less than five mg/L in all but two samples. TDS was not run for the FY05 sampling event, however, TDS concentrations from the FY03 sampling event were below 500 mg/L in all wells and springs including four wells exceeding 1000 feet in depth. The average TDS concentration was 296 mg/L. The four deep wells had a lower mean nitrate-nitrogen concentration (~ 0.23 mg/L) than the overall mean for all wells (1.03 mg/L). Average TDS, nitrate, and other parameters closely resembled the Ozark aquifer samples from the Omaha Monitoring Area. A summary of the data from the 2005 sampling event is presented in Table B-8 in Appendix B.

Jonesboro Monitoring Area

The Jonesboro Monitoring Area includes the town of Jonesboro and surrounding areas in central Craighead County and northern Poinsett County and is located in the Mississippi Embayment physiographic province. The Alluvial Aquifer and the Memphis (northern extension of the Sparta) Aquifer are the primary ground water sources in this area. One of the Jonesboro sampling locations is in the deeper Wilcox Formation. The monitoring area was selected because of the large population using ground water, the exposed condition of the municipal wells, and the extensive drawdown in the Alluvial Aquifer. This area of water level depression coincided with drawdown in the underlying Memphis Aquifer, indicating minimal or no confining units between the two aquifers. In addition, many potential contaminant sources exist in the area including pesticides, industrial solvents, landfill leachate, and septic systems. This area was originally sampled during the third quarter of FY89 and was last sampled in July 2003. Information related to the wells sampled for the Jonesboro Monitoring Area is located in Table B-9 of Appendix B.

The water ranged from a calcium-bicarbonate to a strongly sodium-bicarbonate water type, with an intermediate mixed water type containing approximately equal portions of calcium, sodium, and magnesium. Two of the six Memphis Aquifer samples were strongly sodium bicarbonate, containing sodium concentrations that comprised over 85 percent of the total cations. These two wells were greater than 800 feet in depth. Nine of the fourteen Alluvial Aquifer water samples had calcium concentrations comprising over 50 percent of the total cations (calcium-bicarbonate water type), and the rest of the wells were a mixed water type. This suggests a gradual chemical evolution from a calcium dominated water type in the shallow Alluvial Aquifer to sodium dominated water at depth within the Memphis Aquifer.

Overall water quality is suitable for most uses. TDS concentrations ranged from 71.5 to 703 mg/L, with 2 of the 18 samples exceeding the SMCL of 500 mg/L. Iron was detected in 16 of the 18 samples at concentrations ranging from 24.9 to 8790 µg/L, with 6 of these detections exceeding the SMCL of 300 µg/L. Manganese was detected in 16 of the 18 samples at concentrations ranging from 185 to 2180 µg/L, with 7 of these detections exceeding the SMCL of 50 µg/L. Nitrate-nitrogen was detected in 11 samples at concentrations ranging from 0.023 to 2.19 mg/L. A summary of the ground water analyses is presented in Table B-10 of Appendix B.

Lonoke Monitoring Area

The Lonoke Monitoring Area includes the town of Lonoke and surrounding areas in central Lonoke County and is also located in the Mississippi Embayment physiographic province. Ground water is withdrawn from the Alluvial and Sparta Aquifers for agricultural, domestic, and municipal use. This monitoring area was selected because it represents a rural, agricultural community that relies entirely on ground water for all of its water needs. Pesticides are the primary potential contaminants in the area. Ground water monitoring in the Lonoke Monitoring Area began in 1988 with the most recent sampling event occurring in the fourth quarter of FY04.

Ground water samples were obtained from 13 wells screened in the Alluvial Aquifer and 2 wells completed in the Sparta Aquifer. A summary of the sampling sites and their locations is presented in Table B-11 in Appendix B of this report.

Ground water quality is generally good. Iron was detected in all 15 wells at concentrations ranging from 526 to 22,900 µg/L, which exceed the SMCL. Manganese also was detected in all wells at concentrations above the SMCL, and ranged from 243 to 2,460 µg/L. TDS concentrations ranged from 138 to 523 mg/L, with the SMCL of 500 mg/L exceeded in one well. Selected descriptive statistics are presented in Table B-12 in Appendix B of this report. There was only one pesticide detection in the 2004 data. Metolachlor was detected in one well (LON009A) at a concentration of 0.054 µg/L; this concentration is well below the USEPA HAL for metolachlor of 100 µg/L.

Northeastern Ouachita Mountains Monitoring Area

The Northeastern Ouachita Mountains Monitoring Area, also known as the Frontal Ouachita area, is located in central Arkansas within Pulaski and Saline counties in the Ouachita

Mountains physiographic province. Strata within this monitoring area consist of Paleozoic sandstones, shales, novaculites, and cherts. These strata were intensely folded and faulted during the late Paleozoic into generally east-west trending anticlines and synclines, and imbricate strike ridges and valleys. Typically, novaculite or sandstone forms prominent ridge tops, while intervening valleys are composed mainly of shales. Initial sampling took place during the fourth quarter of FY04 and the first quarter of FY05, and was limited to rural areas where domestic wells, springs, and small community systems were available. This area was chosen for study to establish baseline ground water quality for several Paleozoic aquifers previously excluded from the monitoring network, to evaluate possible anthropogenic effects of growing commercial and residential development, and to assess the potential impact of septic systems, livestock and poultry production to ground water. A total of 27 wells and two springs were sampled during the initial sampling event. Laboratory analyses included inorganic chemistry and nutrients.

Paleozoic strata exposed at the surface include formations ranging in age from Ordovician through Mississippian. Twenty-four of the twenty-seven wells are completed in bedrock and are mostly uncased and likely receive water from more than one formation. Because of the structurally complex nature of the area geology, each sampling location was assigned to the formation present at the surface. As such, 18 samples were taken from the Ordovician Womble Shale, 3 from the Ordovician Bigfork Chert, 2 from the Devonian to Mississippian Arkansas Novaculite, 2 from the Mississippian Stanley Shale, and 1 from a spring at the Ordovician Bigfork Chert/Polk Creek Shale contact. The remaining three wells are completed in Quaternary terrace deposits of the Alluvial Aquifer. Information related to the wells and springs sampled for this monitoring area is located in Table B-21 of Appendix B.

Overall ground water quality was good. Iron was detected in 23 of the 29 samples at concentration ranging from 0.26 to 5910 µg/L, with three exceedances of the SMCL (300 µg/L). Manganese was detected in 27 of the 29 samples at concentrations ranging from 0.24 to 735 µg/L, with eight exceedances of the SMCL (50 µg/L). Arsenic was detected in 16 of 29 samples at concentrations ranging from 0.78 to 3.39 µg/L, thus all were below the 10 µg/L MCL. Nitrate-nitrogen was detected in 26 of the 29 samples at concentrations ranging from 0.012 to 12.8 mg/L, with only one exceedance of the MCL (10mg/L). A number of the nitrate detections are located in an area where septic systems are used exclusively, livestock is present, and chicken houses were present in the past. Selected descriptive statistics are presented in Table B-22 in Appendix B.

Omaha Monitoring Area

The Omaha Monitoring Area encompasses the northwest quarter of Boone County and is located in the Ozark Plateaus physiographic province. Ground water is obtained from the Springfield Plateau and Ozark Aquifers, which are in limestone and dolostone formations, respectively. Ground water monitoring was initiated to evaluate potential impacts in an area of karst geology. Potential contaminant sources include abundant livestock farms and USTs. In addition, ground water contamination was documented within the monitoring area at a former wood treatment plant; a listed Superfund site. Monitoring began during the first and second quarters of FY89 with the most recent sampling event occurring during the spring of 2007. Ground water samples were obtained from 10 springs and 15 wells. With one exception, all of the springs discharge from the Springfield Plateau aquifer. Similarly, all but one of the wells penetrates the Ozark aquifer. A summary of the sampling sites and their locations is in Table B-13 in Appendix B of this report.

The 2007 analytical data for the samples from the Springfield Plateau Aquifer are presented in Table B-14a in Appendix B. Overall ground water quality was good. Iron was detected in only one well at a concentration of 21.1 µg/L which is below the SMCL (300 µg/L). Manganese was detected in one well and one spring at the concentrations of 0.59 to 87.7µg/L, respectively. The manganese concentration in the spring exceeded the SMCL (50 µg/L). Nitrate nitrogen was detected in all Springfield Plateau Aquifer samples at concentration ranging from 1.89 to 9.25 mg/L, with an average concentration of 3.51 mg/L. Nitrate-nitrogen concentrations were generally higher in the Springfield Plateau Aquifer spring samples, ranging from 1.89 to 9.25 mg/L, with a mean concentration of 3.51 mg/L. Arsenic was detected in eight samples at concentrations ranging from 0.53 to 0.83 µg/L, which are below the MCL of 10 µg/L.

The 2007 analytical data for the samples from the Ozark Aquifer are presented in Table B-14b in Appendix B. Overall ground water quality was good. Iron was detected in only one Ozark Aquifer sample at a concentration of 52.8 µg/L, which is below the SMCL (300 µg/L). Manganese was detected in 12 of 15 samples at concentrations ranging from 0.43 to 7.26 µg/L, which are below the SMCL (50 µg/L). Nitrate-nitrogen was detected in all of the Ozark Aquifer samples at concentrations ranging from 0.051 to 3.84 mg/L, with a mean concentration of 0.804 mg/L. Arsenic was detected in 12 Ozark aquifer samples at concentrations ranging from 0.53 to 4.42 µg/L; however, these concentrations are lower than the 10 µg/L MCL for drinking water.

Ouachita Monitoring Area

The Ouachita County Monitoring Area is located in western Ouachita County and includes the city of Camden. This monitoring area is located in the Gulf Coastal Plain physiographic province within the recharge area of the Sparta Aquifer; the second most heavily used aquifer in the State. In addition, a portion of the Cockfield Aquifer recharge area is located in the southwestern portion of this monitoring area. Ground water is the primary water source used for domestic, municipal, and industrial purposes. Ground water monitoring began during the first quarter of FY86 and has continued on a three-year interval. The most recent sampling event occurred during the second quarter of FY04. Ground water samples were obtained from 14 shallow to moderately deep wells and 1 spring. Most of the wells penetrate the Sparta Aquifer; however, several wells potentially penetrate the underlying Cane River Formation. This formation is considered the lower confining unit of the Sparta; however, some minor water-bearing zones exist which are used for domestic water supplies. A summary of the sampling sites and their locations is in Table B-15 in Appendix B.

Selected descriptive statistics for the Ouachita County monitoring area are presented in Table B-16 in Appendix B. Water quality in this monitoring area is also good, with TDS concentrations ranging from 19.5 to 207.0 mg/L. Water type is variable and generally ranges from a calcium-bicarbonate water type at shallow depths to a sodium-bicarbonate water type in the deeper portions of the aquifer. Iron was detected in 12 of 15 wells at concentrations ranging from 21.4 to 3250 µg/L, with six detections above the recommended SMCL of 300 µg/L. Manganese was detected in all of the Ouachita County samples at concentrations ranging from 0.77 to 63.8 µg/L, with one of 15 samples above the SMCL of 50 µg/L. Nitrate-nitrogen was also detected in all samples at concentrations ranging from 0.02 to 4.87 mg/L, with an average concentration of 0.96 mg/L.

Pine Bluff Monitoring Area

The Pine Bluff Monitoring Area includes the town of Pine Bluff and surrounding areas in central Jefferson County. The monitoring area straddles the boundary between the Gulf Coastal Plain and Mississippi Embayment physiographic provinces. Ground water in the area is withdrawn from the Alluvial, Cockfield, and Sparta Aquifers, which are the only sources of water to the community. The Alluvial and Cockfield Aquifers are used primarily for irrigation and domestic purposes, while the Sparta is used for municipal and industrial purposes. The Pine Bluff monitoring area was originally sampled during the first quarter of FY87. The most recent sampling event occurred during the fourth quarter of FY04. Three wells penetrate the Cockfield Aquifer, four wells penetrate the Alluvial Aquifer, and ten wells penetrate the Sparta Aquifer. A summary of the sampling sites and their locations is in Table B-17 in Appendix B of this report.

Selected descriptive statistics for the Pine Bluff monitoring area are presented in Table B-18 in Appendix B. The ground water quality was generally good. The Alluvial Aquifer produces a calcium-bicarbonate water type; whereas, the Cockfield and Sparta Aquifers produce a sodium-bicarbonate water type. Iron was detected all 17 of the Pine Bluff wells at concentrations ranging from 22 to 44,500 µg/L, with 15 detections exceeding the SMCL (300 µg/L). Manganese was detected in 16 of the 17 wells at concentration ranging from 27 to 2850 µg/L, with 14 detections exceeding the SMCL (50 µg/L). Nitrate-nitrogen was detected in all wells at very low concentration ranging from 0.011 to 0.232 mg/L. Arsenic was detected in only two wells, both completed in the Alluvial Aquifer. The arsenic concentrations were 3.32 µg/L and 28.9 µg/L, with the latter concentration exceeding the MCL of 10 µg/L. This well is used for irrigation purposes only. VOC analysis was conducted on the four alluvial wells. Methylene chloride, a common laboratory contaminant, was the only VOC detected.

Short-Term Water Quality Monitoring (Special Investigations)

An extensive ground water quality data base has been developed as a result of numerous investigations primarily by the U of A at Fayetteville, USGS, and ADEQ. However, most of this information is available by hard-copy only in the form of reports and publications. A search of the list of publications for all organizations will reveal numerous ground water investigative reports for different areas of the State. These investigations are a valuable source of ground water quality data. However, similar caveats apply to the quality of the data as discussed above concerning data from regulated sites, in that some of these investigations may be performed at sites with known sources of contamination and do not necessarily represent ambient or background water quality.

United States Geological Survey

During FY04 through FY07, the USGS Arkansas Water Science Center (WSC) was involved in several projects related to the assessment of ground water quantity and quality issues. Many of the projects involved cooperative efforts with other state agencies and are described below.

Ground water data collection activities in the State continue with high visibility resulting from increasing public and agency concerns over drawdowns in the Sparta and Alluvial aquifers. Continuing USGS ground water programs include: a cooperative program to monitor the ground water levels of Arkansas's eight major aquifers on a rotating basis, collection of conductance samples, the master wells ground water quality program, operation of five continuous ground water recorders and 20 real-time stations, geophysical logging of wells and conducting one aquifer test on a yearly basis. The Arkansas WSC collected specific conductance from 50 wells, water-level measurements in over 300 alluvial aquifer wells, and 330 water levels from the Sparta aquifer as part of the 2-year rotating ground water program.

A 2-year stream flow gain and loss synoptic study evaluated the ground water and surface water interactions and assessed base-flow water quality and quantity within the Buffalo River from the upstream park boundary to the confluence with the White River. Objectives included: 1) identify spatial locations of stream flow gain and loss; 2) assess base-flow water quality in the Buffalo River and selected tributaries; and 3) quantify the proportion of total annual stream flow contributed by base flow at gauged sites. A seepage run was conducted and data analysis and report writing followed.

Recent USGS findings at Hot Springs National Park (HSNP) show the existence of a geothermal system east of the boundaries and observed hydrologic behaviors that highlight the vulnerability of the thermal water resource of HSNP to changes resulting from human activities, particularly continued urban and suburban development and expansion of infrastructure; including building and extension of major roadways. At this point in time the construction of the Highway 270 east bypass is of great concern.

Activities associated with highway construction and land-use changes may affect the hot springs of HSNP by: 1) causing changes in the quality of the water that recharges the system by introduction of contaminants associated with construction and new land-use activities; and 2) causing changes to the physics of the flow system by opening or closing fracture conduits, by changing surface recharge characteristics (introducing impervious surfaces; removing soil, regolith, and rock strata; changing vegetation cover type and density). The USGS is conducting a four-year study to determine connectivity of the thermal springs flow paths with the area of the proposed highway alignment and potential effects of highway construction and land-use change on the springs.

The three ground water flow and conjunctive-use optimization models (two alluvial and one Sparta) are now complete. Each of the optimization models provides estimates of "sustainable yield" based on constraints that are consistent with criteria used by the ANRC.

ANRC is extremely interested in the results of all three of these modeling studies and is funding a continuing “modeling technical assistance” project that will assist ANRC personnel at public meetings, prepare and conduct presentations, publish fact sheets, and run additional scenarios. The models have helped ANRC understand how redefining certain constraints may affect sustainable yield from the aquifer and rivers, aerial distribution of withdrawals contributing to sustainable yield, and/or total maximum conjunctive withdrawals. Recent applications of the ground water flow model for the alluvial aquifer north of the Arkansas River were published and show the effect of various water-use scenarios for two municipalities in Lonoke County. In addition, several scenarios designed to assess various pumping and stream flow constraints on optimized sustainable yield estimates have been simulated.

Calibration of a ground water flow model of the Ozark Plateaus aquifer system of the Tri-state mining district is nearing completion. The model simulates ground water discharge to streams and springs, and flow through the Springfield Plateau and Ozark aquifers over an area covering about 7,500 square miles. The model will be used to simulate various projected water-use increases out to 2050. A companion water-level map report of the Springfield Plateaus and Ozark aquifers was recently published by the USGS.

The Sparta aquifer is a major water resource for municipal, industrial, and agricultural uses in Union County with water-level declines of more than 360 feet in some areas. Local industry, the city of El Dorado, and Union County currently are working to reduce withdrawals from the Sparta aquifer through water reuse and withdrawing surface water for industry. The impact of these conservation efforts in the recovery of water levels within the Sparta aquifer are being monitored in this study as well as any changes in water-quality characteristics of the aquifer system. This study is providing continuous, real-time, web-accessible water-level data from a network of 8 wells and periodic water-quality data (conductance and chloride) from a network of 12 wells withdrawing water from the Sparta aquifer to detect trends. This project is in its sixth year and is funded by the Union County Water Conservation Board (UCWCB). The USGS is working closely with the consulting firm Burns and McDonnell who are under contract to the UCWCB and act as their staff.

The Ozark Plateaus study unit of the USGS National Water-Quality Assessment Program was selected in 2004 as one of three new Nutrient Enrichment and Ecology Topic (NEET) study units. Approximately 30 stream sites in Arkansas, Missouri, and Oklahoma will be selected in 2005 and sampled in 2006. The sites will span the range of nutrient concentrations in streams in non-urban settings in the Springfield and Salem Plateaus. Sampling of water quality, benthic macroinvertebrates, and periphyton were conducted at two trend stream sites in 2005. Ground water sampling of six wells were conducted in western Arkansas, western Missouri, and eastern Oklahoma in 2005.

The Ozark cavefish’s (*Amblyopsis rosae*) distribution includes Missouri, Arkansas, and Oklahoma, and was listed as a threatened species in November of 1984 due to threats from human disturbance and water quality. The extent and location of the local recharge areas that contribute water to selected caves where the cavefish live in the Ozark Plateaus in Arkansas and Oklahoma is unknown. The sources of water in caves are from aquifers whose recharge area may be the local surface water drainage divide or from geologic/aquifer outcrop areas located at a distant. The objective of this 3-year study is to collect hydrologic information that will provide a preliminary delineation of the boundaries of the local recharge to six caves in the Ozark Plateaus of Arkansas and Oklahoma.

Arkansas Department of Environmental Quality

A review of existing water quality data sets from ADEQ files was conducted in FY03 to assess the occurrence, distribution, and concentration of arsenic (As) in various aquifer systems throughout Arkansas, with particular emphasis on elevated arsenic in the Alluvial Aquifer of eastern Arkansas. The assessment of arsenic in ground water was prompted by the USEPA revision of the MCL for arsenic from 50 µg/L to 10 µg/L. The final rule was published in the Federal Register on January 22, 2001 (USEPA, 2001). A review of the ground water quality data reveals that arsenic concentrations >10 µg/L have been found solely in ground water within the Quaternary alluvial sediments in eastern Arkansas. Although arsenic concentrations in samples from mineralized fault zones and whole-rock demonstrate the potential for ground water contamination in the Ozark and Ouachita Mountain regions of Arkansas, no arsenic concentrations >10 µg/L have been documented in ground water samples from these regions of the state.

Preliminary evidence from the statistical treatment of existing data sets suggested that elevated levels of arsenic in the alluvial aquifer of eastern Arkansas were the result of the dissolution of arsenic-bearing iron oxyhydroxide coatings on the sand grains serving as the aquifer material. The primary evidence for reductive dissolution of the Fe oxides was based on geochemical trends of reduction-sensitive parameters including As, NO_3-N, NH_4-N and Fe. The oxidation of low-grade lignite and weathered peat is proposed as the reduction driver in the alluvial aquifer, based on numerous drill logs documenting abundant organic matter. The past use of arsenical pesticides were ruled out as a potential source based on the low-leaching potential, competition with phosphorus in the formation of insoluble salts, the lack of arsenic concentrations in ground water with TDS concentrations <175 mg/L, and the inverse relation of arsenic with NO_3-N and ortho-phosphate concentrations (Kresse and Fazio, 2003).

During the second half of FY05, ADEQ ground water program personnel initiated an intensive sampling program with the intent of sampling approximately one well per square mile in the upper Bayou Bartholomew watershed to assess the aerial distribution of arsenic with respect to geology and other attributes. A total of 109 water samples were collected from irrigation wells in the upper portion of the Bayou Bartholomew watershed in Jefferson County. The investigation demonstrated that elevated arsenic (>10 µg/L) occurs almost solely in stream channel deposits (Qcm), with low arsenic concentrations in the over bank deposits (Qso). Ground water from the Qso deposits contained significantly higher sulfate concentrations than ground water in the Qcm deposits. A strong inverse relationship between arsenic and sulfate concentrations tends to support an earlier theory of sulfide formation as a solubility control on soluble arsenic in ground water.

Following completion of the well-sampling program, ADEQ worked with the Arkansas Geological Commission to drill approximately nine borings in Jefferson County, including the collection of 60-65 grab samples of cuttings from the borings. The USGS National Geochemical Survey Project, under the guidance of Andrew Grosz, was designed to create a consistent national geochemical database from approximately 25,000 stream sediment and soil samples with an average grid spacing of 17km and which have all been analyzed with the same analytical routines. The USGS in Reston, Virginia, performs analysis of the sediment samples, and Mr. Grosz agreed to sample the cuttings from the borings installed for the arsenic monitoring program in the Bayou Bartholomew watershed. The USGS laboratory has a rather extensive backlog of samples, and the analyses are not currently completed. ADEQ hopes to use this data to show the vertical distribution and range of arsenic in sediments within sediment profiles from different geologic settings in the upper Bayou Bartholomew watershed in Jefferson County.

ADEQ assisted the University of Arkansas (U of A) in a detailed, state-of-the-science, investigation into sources of arsenic in the Bayou Bartholomew watershed in Jefferson County. The investigation involved coring of three holes along a line perpendicular to Bayou Bartholomew and including both the Qcm and Qso exposures, bench-scale leaching of sediment samples from the core according to a tiered extraction process, X-ray diffraction of sediments, arsenic speciation of ground water samples from wells installed in the three borings, and other activities to evaluate present theories derived from existing water-quality analyses in the area. Activities completed in 2006 included drilling of the holes, coring for sediment samples, installation of wells, and the start of sediment extraction. Field activities were completed during 2006 and laboratory extraction was completed in late 2007. Results of the study have been published in several parts, within one Master's thesis and one PhD dissertation produced under the auspices of the U of A Department of Geosciences.

University of Arkansas at Fayetteville

The U of A at Fayetteville has been involved in ground water quality investigations for almost three decades. Early studies focused on recording and describing general water quality in the shallow aquifer systems in northwest Arkansas, but have advanced to include investigations of the various ground water flow components in both the unsaturated and saturated zones of karst areas; impacts to ground water quality from point source and nonpoint sources in northwest Arkansas; fate and transport of pollutants in shallow ground water systems; and modeling of both flow and contaminant transport with particular emphasis on karst ground water flow systems. The U of A has extended their boundaries of investigations to include ground water investigations in the eastern portion of the state, including contaminant transport and vertical and horizontal flow determinations in the Sparta and Alluvial Aquifer systems. Much of this research has been funded or performed in conjunction with state agencies and furthers the goals of the State in preserving ground water quality and quantity throughout Arkansas. Additionally, much of the research has been performed at the Savoy Experimental Watershed (SEW), which is a joint effort of the U of A Departments of Animal Science and Geosciences, ADEQ, the Agricultural Research Service of the USDA, and USGS. The 1250-hectare site is unique in that it is truly an experimental watershed with heavily-forested areas and limited grazing on small, pastured sections. The following table includes recently initiated or completed theses that have benefited from ADEQ collaboration, or have application to ADEQ objectives:

NAME	TOPIC	STAUTS
Tiong Ee Ting	Chemical Procedures for Tagging Bacteria and Clays with Lanthanides for Use as Hydrologic Tracers	Ph.D.—Completed (CHEN) 2005 Advisor--Thoma
Sherri DeFauw	Processes and Controls Affecting Ground Water in the Epikarst of an Agroforestry Research Site, Southern Ozarks	Ph.D.--Completed 2006 (ENDY) Advisor-Hays
Ruwaya Al-Kendi	Development of a Bacterial Source Tracking and Apportionment Methodology Using DNA Micro Arrays and Luminex Micro Beads, and Its Application to To the Ozark Plateau	Ph.D.—In Prep (ENDY) Advisor-Davis
Chris Hobza	Ground Water Quality Near a Swine Waste Lagoon in a Mantled Karst Terrane in Northwestern Arkansas	M.S.—Completed 2006 (GEOL) Advisor-Hays
Susan Bolyard	Hydrogeology and Geochemical Processes and Water-Quality Evolution Related to the Parsons Landfill near the Beaver Reservoir Area, Arkansas	M.S.—2007 (GEOL) Advisor-Brahana
Paul Little	Hydrogeologic Factors Controlling Ground water Flow in Basin 2, Savoy Experimental Watershed, Northwest Arkansas	M.S.—In Prep (GEOL) Advisor-Brahana
Mansour Leh	Quantification of Rainfall-Runoff Mechanisms in Pasture-Dominated Watersheds	M.S.—Completed 2006 (BAEG) Advisor-Chaubey
Aaron Laubhan	Hydrogeologic Controls on Flow and Transport in the Vicinity of the Tontitown Landfill, Northwest Arkansas	M.S.—Completed 2007 (GEOL) Advisor-Davis
Dan Wagner	In-situ Assessment of Waste Storage Effectiveness in Karst Using Stable Isotope Biogeochemistry	M.S.—Completed 2007 (GEOL) Advisor-Hays
Jozef Laincz	Nitrogen Transport and Cycling in the Interflow Zone of a Mantled Karst Watershed, Northwest Arkansas	Ph.D.—In Prep ENDY Advisor-Hays

In a cooperative study between NRCS National Water Management Center (NWMC), U of A, and ADEQ, nitrate processing is being characterized in karst hydrogeological zones, particularly in the interflow zone. Nutrient processing that may occur in the zone, which has increased ground water retention time and water-matrix interaction, is important because of the lack of processing in the focused-flow karst soil areas. Nitrate processing was characterized using dissolved organic carbon concentration and bioavailability, and concentration of reactive (nitrate) versus conservative (chloride) species. Also, concentration and isotopic composition of nitrate was used to determine the extent of denitrification and immobilization of nitrate. Study results show that 30 percent of the nitrate moving through the zone can be microbially processed. The level of processing is dependent upon flow-path and hydrologic conditions. Bioavailability of DOC is increased relative to the focused-flow area under high flow conditions. Nitrogen and oxygen stable isotope data suggest denitrification is occurring. The zone appears to be potentially important for nitrate attenuation in karst settings. Work in progress will better quantify processing rates and differences in flow paths. In other activities at the SEW, 6 new wiers were installed in Basin 1 to improve assessment of surface water movement in that portion of the watershed.

A related study, applying concepts learned in the biogeochemical study described above, also being conducted by the NWMC, U of A, and ADEQ is examining water-quality effects and behavior of nutrients from a swine waste storage lagoon in mantled karst terrane. The lagoon is an anaerobic swine waste lagoon constructed at the Savoy Swine Facility in compliance with Natural Resources Conservation Service Conservation Waste Storage Practice Standard no. 313. Nine shallow monitoring wells were augered to refusal in the regolith. Shallow ground water from wells, springs and an interceptor trench was sampled and analyzed for nutrients, major cations, and major anions during high-flow and low-flow conditions. Results from ground water sampling indicate concentrations of chloride and nitrate were higher than concentrations from non-agricultural land-use areas in the Ozarks, but were statistically insignificant compared to concentrations near the site prior to the construction of the swine facility. The differences in concentrations of chloride during high and low-flow conditions were determined to vary because of dilution, in contrast with nitrate for which decreases in concentrations probably represented biological processing. The results of an electromagnetic geophysical survey indicated no preferential flow paths from the swine waste lagoon.

In order to better characterize nutrient processing and potentially identify preferential zones of flow, two additional shallow ground water interception trenches have recently been completed. Additional monitoring wells also are planned. Water samples taken from the lagoon, trenches, wells, and surface waters presumed to be impacted by anaerobic lagoon leachate will be analyzed for isotope ^{15}N and isotope ^{18}O of nitrate in an effort to define source(s) in the waters and to quantify denitrification indicated by earlier results. Samples also will be analyzed for stable hydrogen isotope ratios and isotope ^{18}O of water and isotope ^{13}C of DIC/DOC to analyze microbial activity in the system and determine mixing relationships between ground waters.

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CHAPTER THREE GROUND WATER/SURFACE WATER INTERACTIONS

The physical interaction of ground and surface water, manifested in the form of losing and gaining streams, impacts regulatory, pollution-prevention, and research programs. This problem has plagued ADEQ in policy and regulatory development and in regulation and cleanup at contaminated sites. Standards used for remediation of ground water contamination associated with an industrial site may adhere to ground water uses; however, these same concentrations may violate stream standards where the ground water discharges into a given stream. In addition, over pumping of ground water, which previously provided base flow to a stream, may reduce the stream storage during dry periods resulting in an impact to the use of the stream. In the Gulf Coastal Plain and Mississippi Embayment, such reversal of a gaining stream to a losing stream has been documented in Ackerman (1996).

Water quality relationships between ground water and surface water in eastern Arkansas are not well understood at the present time. Although both water sources are intensely sampled for general water quality and pesticides, the influence of one source as a contaminant transport pathway to the other source has not been identified. One possible mechanism for the occurrence of pesticides in ground water in eastern Arkansas is the recharge of pesticide-contaminated stream water in losing-stream segments. However, analysis of pesticide data indicates some differences in the types and amounts of pesticides detected in surface water versus those detected in ground water (Kresse et al., 1997). The investigation of saltwater contamination in Chicot County included review of both stream-station and ground water data to evaluate the potential for chloride contamination of streams from high chloride, base flow contributions. However, elevated chlorides occurred in the streams predominantly during the summer months, which might reflect runoff from ground water irrigated fields rather than base flow contributions.

In northwest Arkansas, both hydrologic budget analyses and contaminant transport have been studied to a greater degree in terms of surface water/ground water interaction than in any other portion of the State. During the last decade, numerous investigations coupled with ongoing monitoring efforts have been performed by dominantly multi-agency coalitions including ADEQ, University of Arkansas at Fayetteville, USGS, ANRC, and National Park Service (NPS). Some of the studies have concentrated on nutrient budgets in addition to hydrologic budgets, while others focus on water quality monitoring coupled with implementation of Best Management Practices (BMP). All studies, however, contain components of surface and ground water interaction.

Nine river sites, twenty tributaries, and three springs are routinely sampled as part of Buffalo National River's Water Quality Monitoring Program. Of the monitored springs, Gilbert Spring has the highest average fecal coliform counts and nitrate-N concentrations and showed a positive trend for fecal coliform concentrations over ten years of monitoring. Storm flow sampling revealed fecal coliform counts as high as 17,700 colonies/100mL from this spring. Highest nitrate concentrations are observed during base flow. Higher and increasing concentrations of bacteria at Gilbert Spring appear to be related to cattle and dairy operations in the Dry Creek drainage, which is pirated by Gilbert Spring.

Mill Creek is a major tributary to the Buffalo National River that has been shown to contribute 96 percent of the nitrate/nitrite-nitrogen load to the Buffalo River below their confluence. Macroinvertebrate community structure and function analyses demonstrate this nitrate load and other pollutants detrimentally affect biologic communities within Mill Creek and the Buffalo River. A synoptic survey of Mill Creek revealed nitrate and orthophosphate concentrations increase upstream to peak at two springs near its head waters. Subsequent dye-tracing showed that the recharge area for these springs extended far beyond their surface watershed and into the adjacent Crooked Creek basin. Geologic mapping indicates that these springs discharge from the base of the Boone Formation, a 120-meter thick karst aquifer, and are localized near the corner of a fault-bounded block that extends beneath both watersheds.

Flow and water quality measurements taken from 1998 to the present and from both streams and springs in the adjoining Crooked Creek and Mill Creek basins help define and characterize the interbasin recharge. Stream discharge/watershed area ratios employed early in the study raised initial suspicions of interbasin transfer; later they verified the accuracy of the dye-trace delineated basins. Water quality analyses showed that springs in the Mill Creek basin that receive interbasin recharge have similar water quality to both streams and springs in the Crooked Creek basin and reflect the more intense agricultural land use occurring in the Crooked Creek basin.

Continued efforts in determining ground water contributions to the Buffalo River, especially in regard to defining ground water recharge zones outside of the Buffalo River watershed, has resulted in the delineation and characterization of ground water recharge in the vicinity of Davis Creek and John Eddings Cave. The Davis Creek watershed is approximately 10 square miles and has numerous places where the water goes subsurface and resurfaces down gradient. A total of 17 traces were conducted in the Davis Creek watershed and surrounding areas between May 2002 and May 2003. A total of 13 ground water traces were conducted for the John Eddings Cave/Elm Springs portion of the study, including four separate types of dye, between April 2001, and April 2002. The Davis Creek traces were made to delineate the recharge area of the Davis Creek basin, while additionally investigating the relationship between Mitch Hill Spring and the Davis Creek basin. Some conclusions regarding the traces were that the total recharge area for Mitch Hill Spring (31,774 acres) is large relative to its surface watershed (2,277 acres), that most of the Davis Creek watershed provides recharge to Mitch Hill Spring, and that the total recharge area for Davis Creek (20,301 acres) is only slightly larger than its surface watershed (18,016 acres). Conclusions regarding the John Eddings Cave/Elm Springs traces were that while Elm Spring and John Eddings Cave are located relatively close to each other, they do not share a common recharge area and are hydrologically isolated from each other, that the total recharge area for John Eddings Cave (231 acres) is roughly three times larger than its surface watershed (75 acres), and that the total recharge area for Elm Spring (1,772 acres) is over twice as large as its surface water recharge area (755 acres) (Mott, 2003). The National Park Service remains committed to delineating and characterizing ground water flow and quality to determine ground water flow contributions and ground water quality impacts from pirated subsurface basins outside of the Buffalo National River watershed.

Several of the U of A investigations involve surface/ground water interaction as a major component of these studies because of the abundant karst features associated with the study sites, including sinkholes, losing stream segments, and springs, which interact on a small spatial scale. The movement of contaminants, especially within the mantled karst aquifer system, has significant impact on both surface and subsurface water quality because of the high degree of surface water and ground water interaction. Many of the subsurface fracture and bedding plane flow paths ultimately exit as springs and seeps, which are tributary to nearby primary streams. The multiple tracer study at the Savoy site, described in the "special investigations" section above, has confirmed that a wet weather losing stream has dual terminal springs located approximately 0.5 kilometers from the losing stream section. Based on the results of modeling at the site, the researchers demonstrated that MODFLOW can be used to simulate steady state flow in mantled karst aquifers with the condition that sufficient detailed data are available to identify matrix and fracture flow paths (Davis et.al. 2006).

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CHAPTER FOUR MAJOR SOURCES OF CONTAMINATION

There are numerous potential and actual sources of ground water contamination in the State. Most of the sources are common to all states and include anthropogenic as well as natural sources. It is difficult to define which sources have the greatest impact on ground water quality, because each source varies in the aerial extent of resulting contamination and in the impact to water quality. For example, a hazardous waste site may result in a severe impact to ground water with numerous organic contaminants exceeding drinking water standards. However, the aerial extent of the contaminant plume may be very limited with no known receptors at risk. Conversely, contamination from agricultural activities may be aerially extensive with little or no impacts to use of the water for drinking and/or other purposes.

Potential point sources of contamination from disposal sites, underground storage tanks, mining operations and other activities are regulated under various programs within ADEQ. Agriculture and other land-use activities commonly are addressed by voluntary BMPs, which strive to protect ground water through landowner education on management. These programs are described in the section titled "Ground Water Protection Programs."

Several investigations have documented nitrate problems in northwest Arkansas, and ongoing monitoring programs in the Coastal Plain area of the State have revealed numerous detections of low concentration pesticides in conjunction with row-crop agriculture. Saltwater intrusion is a localized but very serious problem related to heavy drawdown, irrigation practices, and/or the area hydrogeology. Brine contamination is also a localized problem related to improperly lined surface impoundments, corroded casing of injection wells, or from earlier improper disposal to the land surface or streams. Also, the Surface Water Treatment Rule (SWTR) package under the Safe Drinking Water Act has focused attention on microbial contamination in our public water systems. Recent documented waterborne disease outbreaks have been a cause of national concern. The intent of ADEQ's ongoing, ambient water quality monitoring program is to document changes in the quality of ground water over time, to determine if known areas of contamination are expanding (i.e., areas of saltwater intrusion), and to assist in water quality planning.

Water quality degradation has also been documented from natural sources including saline water and radioactivity. Occurrence of these contaminants is often unique to the stratigraphy of the aquifer, the depositional environments in which the strata were deposited, and in the case of radionuclides, the redox conditions in the water producing horizons.

Contaminants documented in a water supply system, domestic or municipal, may be related to problems in the distribution line or plumbing. As such, these problems may reflect contamination within the system, not actual ground water quality. Table V-4 lists the potential contamination sources.

USEPA 1996 305(b) guidelines encourage each state to list the 10 highest priority sources of ground water contamination. The factors considered when selecting these priority sources Table V-4 are listed in order of importance next to each source. However, the contaminant sources are not ranked. The following factors are listed below:

Table V-4: Major Sources of Ground Water Contamination

Contaminant Source	Ten Highest Priority Sources (X)	Factors Considered	Contaminants
Agricultural Activities			
Agricultural Chemical Facilities			
Animal Feedlots	X	1,4,5,6	
Drainage Wells			
Fertilizer Applications	X	1,4,5,6	
Irrigation Practices			
Pesticide Applications	X	1,5,6	
Storage & Treatment Activities			
Land Application			
Material Stockpiles			
Storage Tanks Above Ground			
Storage Tanks Underground	X	1,2,3,4,5	
Surface Impoundments	X	1,3,4,5	
Waste Piles			
Waste Tailings			
Disposal Activities			
Deep Injection Wells			
Landfills	X	1,3,5,6	
Septic Systems	X	1,3,4,5	
Shallow Injection Wells			
Other			
Hazardous Waste Generators			
Hazardous Waste Sites	X	1,2,3,5,6	
Industrial Facilities			
Material Transfer Operations			
Mining and Mine Drainage			
Pipelines and Sewer Lines			
Salt Storage and Road Salting			
Salt Water Intrusion	X	1,3,4	
Spills	X	1,2,3,5	
Transportation of Materials			
Urban Runoff			

1) Human health and/or environmental risk (toxicity)
2) Size of the population at risk
3) Location of the sources relative to drinking water sources
4) Number and/or size of contaminant sources
5) Hydrogeologic sensitivity
6) State findings, other findings
7) Other criteria

The following contaminants are considered to be associated with each of the sources that were checked:

A) Inorganic pesticides
B) Organic pesticides
C) Halogenated solvents
D) Petroleum compounds
E) Nitrate
F) Fluoride
G) Salinity/brine
H) Metals
I) Radionuclides
J) Bacteria
K) Protozoa
L) Viruses
M) Other

Table V-5 lists the present status of the State Ground Water Protection Programs. As can be seen, most of the programs are fully established or are in the process of implementation. One progressive step that ADEQ's Water Division has taken toward early detection at facilities with potential sources of ground water contamination is to include ground water monitoring requirements for certain facilities within NPDES and State Programs (no discharge) permits. This procedure assists in assessing the impact from sludge application, manure spreading, earthen lagoons, and other sources of potential ground water contamination. Currently, the State Programs Branch has begun the permitting of commercial soil treatment facilities for treatment of petroleum contaminated soils. Ground Water Protection Program personnel are active in reviewing these permits in order to insure that ground water will be protected beneath these facilities. In addition to these steps, the Ground Water Protection Program is actively involved in expanding existing monitoring areas for further inclusion of aquifer systems which lack adequate monitoring, in addition to actively initiating and cooperating on numerous special investigations into ground water threats statewide including confined animal operations, use of pesticides, and saltwater intrusion. The Water Division has also teamed with other divisions to craft a draft policy and technical guidance for setting consistent ground water remediation criteria across all programs. Both the draft policy and technical guidance were completed and signed by the Director in 2006.

Table V-5: Summary of State Ground Water Protection Programs

Program or Activities	**Check (X)**	**Implementation Status**	**Responsible State Agency**
Act SARA Title III Program	X	Fully Established	ADEQ
Ambient Ground Water Monitoring	X	Fully Established	ADEQ
Aquifer Vulnerability Assessment	X	Continuing Efforts	ANRC/U of A
Aquifer Mapping	X	Continuing Efforts	Multi-Agency
Aquifer Characterization	X	Continuing Efforts	Multi-Agency
Comprehensive Data Management	X	Under Development	ANRC
USEPA Endorsed CSGWPP	X	Pending	ANRC
Ground Water Discharge Permit	NA	NA	ADEQ
Ground Water – BMPs	X	Continuing Efforts	Multi-Agency
Ground Water Legislation	X	Usage only/Established	ANRC
Ground Water Classification	X	Continuing Efforts	ADEQ/ANRC
Ground Water Quality Standards	X	Under Development	ADEQ
Interagency Coordination – GW	X	Continuing Efforts	ANRC
Nonpoint Source Controls	X	Continuing Efforts	ANRC/ADEQ
Pesticide State Mgmt Plan	X	Fully Established	SPB
Pollution Prevention Program	X	Continuing Efforts	ADEQ, ANRC, ADH, ASP, CES, NRCS
RCRA Primacy	X	Fully Established	ADEQ
State Superfund	X	Fully Established	ADEQ
State RCRA Program – More Strict than RCRA Primacy	NA	NA	ADEQ
State Septic Tank Regulations	X	Fully Established	ADH, ADEQ
UST Installation Requirements	X	Fully Established	ADEQ
UST Remediation Fund	X	Fully Established	ADEQ
UST Permit Program	X	Fully Established	ADEQ
UIC Program	X	Fully Established	ADEQ
Vulnerability Assessment for Drinking Water/Wellhead Protection	X	Continuing Efforts	ADH
Well Abandonment Regs.	X	Fully Established	AWWCC/ANRC
USEPA-Approved WHPP	X	Fully Established	ADH
Well Installation Regulations	X	Fully Established	AWWCC/ANRC

ADEQ: Arkansas Department of Environmental Quality; AS&WCC: Arkansas Natural Resources Commission; ADH: Arkansas Department of Health; SPB: Arkansas State Plant Board; NRCS: Natural Resources Conservation Service; CES: University of Arkansas Cooperative Extension Service; AWWCC: Arkansas Water Well Construction Commission.

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PART VI PUBLIC PARTICIPATION (REG NO. 8)

The Public Participation Program (Regulation No. 8) at ADEQ is designed to be an active program that seeks out individuals and/or organizations that may provide useful input and those who will be affected by ADEQ activities. The program includes provisions for disseminating information to the public through easily accessible avenues. These avenues include, but are not limited to, local media, internet access, and information depositories located throughout the State. Additional avenues include the publication and distribution of newsletters, informational pamphlets, and activity reports; and the participation of ADEQ representatives at public meeting, hearings, and citizen group gatherings.

The purpose of the public participation program at ADEQ is to inform affected Arkansans, organizations, and public officials of the factors involved in, and of decisions contemplated in, ADEQ activities. It is also used to incorporate public thinking into planning decisions and to provide all citizens and organizations an equal opportunity to influence the design of alternatives and selection of choices. This process will produce activities that have substantial community support.

The current Public Participation Program at ADEQ complies with all applicable regulations and guidelines of the FWPCA amendments of 1979 40 CFR, Parts 25 and 35

For additional information concerning the Public Participation Program at ADEQ, visit the Water Division web site http://www.adeq.state.ar.us/water/reports_data.htm and go to the Continuing Planning Process document.

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APPENDIX A WATERBODY-SPECIFIC INFORMATION BY PLANNING SEGMENT

A segment-specific water quality analysis was conducted for each of the 38 planning segments utilizing the monitoring network stations and other available data. Support or nonsupport of a designated use was assessed by using the assessment methodology described earlier.

Data included for each planning segment includes:

1. A description of the segment location and its major waters.
2. A narrative summary of the water quality within the segment.
3. A planning segment map with river reaches identified by hydrologic unit code and reach numbers, and includes monitoring stations and NPDES permitted discharges.
4. An assessment of use support by river reach.
5. A listing of permitted discharges within the segment.

The stream reach assessment tables utilize the following abbreviations:

General
E = Evaluated Assessment
M = Monitored Assessment
U = Unassessed (Unknown)
S = Use Supported
N = Use Not Supported
R = Use Removed

Designated Uses
FC = Fish Consumption
AL = Aquatic Life Use
PC = Swimming (Primary Contact)
SC = Secondary Contact
DW = Drinking Water Use
AI =Agriculture and Industrial Use

Causes
SI = Siltation/Turbidity
AM = Ammonia
NO_3 = Nitrogen (Nitrates)
TP = Total Phosphorus
NU = Nutrients (NO_3, TP)
DO = Dissolved Oxygen
Temp = Water Temperature
PA = Pathogen Indicators (Bacteria)
CL = Chlorides
SO_4 = Sulfates
TDS = Total Dissolved Solids
OE = Organic Enrichment
PO = Priority Organics
Al = Aluminum
Be = Beryllium
Cu = Copper
Hg = Mercury
Pb = Lead
Zn = Zinc

Sources
AG = Agriculture
SE = Surface Erosion
RE = Resource Extraction
SV = Silviculture
UR = Urban Runoff
RC = Road Construction/Maintenance
IP = Industrial Point Source
MP = Municipal Point Source
HP = Hydropower
UN = Unknown
NB = Naturally Occurring (Background)

Water Quality Monitoring
Y = USGS Gauging Station Present
A = Ambient Network Sampling Station
R = Roving Network Sampling Station
S = Special Project Sampling Station
USNPS = U.S. National Park Service
1 = Assessment based on new data
2 = Assessment forwarded from 2006

STATUS = assessment status

1 = Attaining all designated uses;

2 = Attaining some designated uses, but there is insufficient data to determine if other uses are being attained;

3 = Insufficient data to determine if any designated use is attained;

4 = Impaired for one or more designated uses, but does not require the development of a TMDL because:

a. A TMDL has been completed for the listed parameter(s);
b. Other pollution control requirements are expected to result in attainment of water quality standards; and/or
c. Impairment is not caused by a pollutant

5 = The waterbody may be impaired, or one or more designated uses may not be attained. Waterbodies in Category 5 are placed in one of the following subcategories:

a. Truly impaired; develop a TMDL or other corrective action(s) for the listed parameter;
b. Waters currently not attaining standards, but may be de-listed with future revisions to Regulation No. 2, the state water quality standards;
c. Waters in which the data is questionable because of QA/QC procedures and which require confirmation before a TMDL is scheduled;
d. Waters which need data verification to confirm use impairment (additional sampling, biological assessment) before a TMDL is scheduled;
g. Waters which are impaired by point source discharges and future permits restrictions are expected to correct the problem;
h. These are waters that are not currently meeting a water quality standard. However, "the basis for not meeting an applicable water quality standard is not caused by a pollutant, but is attributed to other types of pollution" (EPA, 2005).
g. Waterbodies added to ADEQ's list of Impaired Waterbodies by EPA.

Appendix A Table of Contents

This appendix contains the following sections:

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Red River Basin

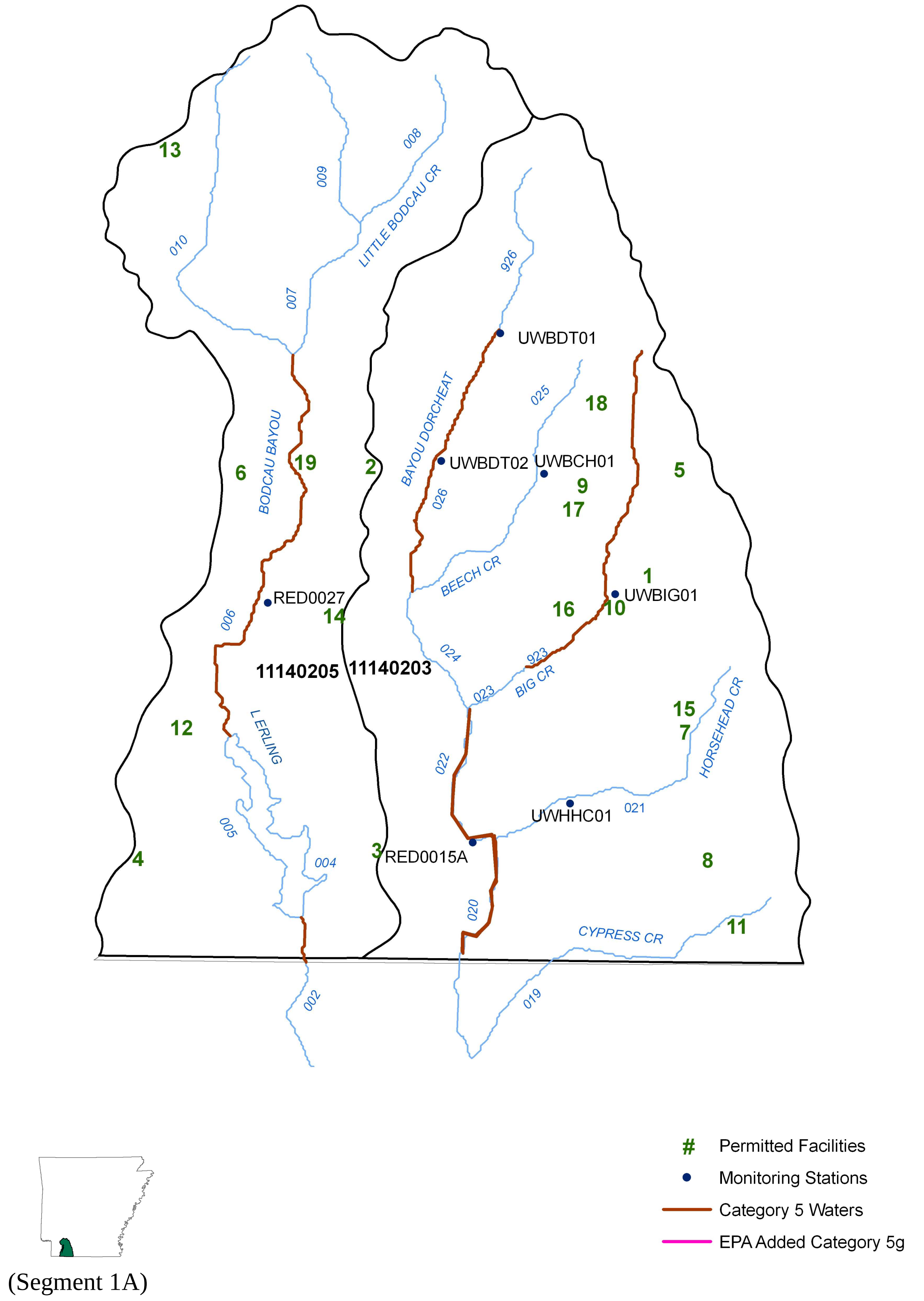
SEGMENT 1A DORCHEAT BAYOU AND BODCAU BAYOU

This segment is located in the southwest corner of the State and includes most of Columbia County as well as parts of Nevada, Hempstead, and Lafayette Counties. The drainage is generally southward into Louisiana and the major streams are Dorcheat Bayou and Bodcau Bayou. Lake Erling is a major impoundment on Bodcau Bayou and Lake Columbia is a major impoundment on Beech Creek, a tributary to Dorcheat Bayou.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation and public, industrial, and agricultural water supplies. Monitored data were used as the basis of assessing 116 miles of stream within this segment. An additional 81.5 miles were evaluated, bringing the total number of miles assessed with in this segment to 197.5 stream miles.

Figure A-1: Planning Segment 1A



(Segment 1A)

Table A-1: Planning Segment 1A—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NON-SUPPORT
SEG-1A																										
Dorcheat Bayou[1]	11140203	-926	11.4	UWBDT01	M	S	S	S	S	S	S									1						
Dorcheat Bayou[2]	11140203	-026	11.7	UWBDT02	M	N	N	S	S	S	S	UN	UN			pH	DO			5f	5f			FISH CONSUMPTION	165.5	32.0
Dorcheat Bayou	11140203	-024	7.0		E	S	S	S	S	S	S									1				AQUATIC LIFE	118.6	78.9
Dorcheat Bayou	11140203	-022	8.4	RED0015A	M	N	N	S	S	S	N	UN	UN	SE	UN	1	Pb	SI	pH	5d	5d	5d	5f	PRIMARY CONTACT	197.5	0.0
Dorcheat Bayou	11140203	-020	11.9		E	N	N	S	S	S	N	UN	UN	SE	UN	1	Pb	SI	pH	5d	5d	5d	5f	SECONDARY CONTACT	197.5	0.0
Cypress Creek	11140203	-019	18.5		E	S	S	S	S	S	S									1				DRINKING SUPPLY	197.5	0.0
Horsehead Creek	11140203	-021	16.8	UWHHC01	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	177.2	20.3
Big Creek	11140203	-923	18.5	UWBIG01	M	S	N	S	S	S	S	IP				Pb				5d						
Big Creek	11140203	-023	3.3	RED0065	M	S	S	S	S	S	S									1						
Beech Creek	11140203	-025	15.7	UWBCH01	M	S	S	S	S	S	S									1						
Bodcau Creek	11140205	-010	19.5	RED0056	E	S	S	S	S	S	S									1						
Bodcau Creek	11140205	-009	9.5		E	S	S	S	S	S	S									1						
Bodcau Creek	11140205	-008	9.1		E	S	S	S	S	S	S									1						
Bodcau Creek	11140205	-007	7.8	RED0057	M	S	S	S	S	S	S									1						
Bodcau Creek	11140205	-006	22.4	RED0027	M	S	N	S	S	S	S	UN	SE	UN		2	SI	pH		5d	5d	5f				
Bodcau Creek	11140205	-002	6.0		E	S	N	S	S	S	S	UN	SE	UN		2	SI	pH		5d	5d	5f				
TOTAL MILES	197.5																									
MILES UNASSESSED	0																									
MILES EVALUATED	81.5																									
MILES MONITORED	116.0																									

FC = TMDL for Hg, Category 4a

1 = SO4 & TDS
2 = Cu, Pb, & Zn.

1 Reach formally -026U
2 Reach formally -026L

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
UWBDT01	Bayou Dorcheat at Highway 355		2	R
UWBDT02	Bayou Dorcheat at Highway 82, 6 miles west of Waldo		2	R
RED0015A	Bayou Dorcheat east of Taylor	Y	1	A
UWHHC01	Horsehead Creek at Highway 19, 2 miles north of Walkerville		2	R
UWBIG01	Big Creek at Highway 132 near Magnolia		2	R
UWBCH01	Beech Creek at Highway 82 near Waldo		2	R
RED0056	Little Bodcaw Creek at Highway 29 near Lewisville		2	R
RED0057	Bodcaw Creek at Highway 355 near Hempstead County Line		2	R
RED0027	Bodcaw Creek south of Lewisville	Y	1	A

Table A-2: Segment 1A Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000434	AMERICAN FUEL CELL & COATED FA	TRIB,BIG CK,DORCHEAT BU,RED RV	11140203	023	1
AR0000493	ENTERGY-HARVEY COUCH STEAM ELE	LK JUNE TRIB,BODCAW CK	11140205	006	2
AR0020044	TAYLOR, CITY OF	LTL CROOKED CK	11140203	020	3
AR0020621	BRADLEY, CITY OF	TRIB,WHEELER CK,MARTIN CK,BODCAW BU	11140205	002	4
AR0021555	MCNEIL, CITY OF	O'REAR CK,BIG CK,RED RV	11140203	023	5
AR0035696	LEWISVILLE, CITY OF	STEEL CK,BODCAU BU	11140205	006	6
AR0038857	ALBEMARLE CORP-SOUTH PLANT	TRIB,HORSEHEAD CK,DORCHEAT BU,RED R	11140203	021	7
AR0039594	EMERSON, CITY OF	TRIB,LTL CYPRESS CK,DORCHEAT BU	11140203	019	8
AR0043508	WALDO, CITY OF	TRIB,BIG CK	11140203	023	9
AR0043613	MAGNOLIA, CITY OF-BIG CREEK WA	DIT,BIG CK,DORCHEAT BU,RED RV	11140203	023	10
AR0043923	WEYERHAEUSER CO.-EMERSON DIV.	S CYPRESS CK,DORCHEAT BU,L BISTINEA	11140203	019	11
AR0045535	CANFIELD BAPTIST ASSEMBLY	TRIB,MILL BR,HEIRS BR,LK ERLING	11140205	006	12
AR0046345	SPRING HILL SCHOOL	TRIB,FLAT BOIS D'ARC C,LT BODCAW C	11140205	010	13
AR0046418	LONGVIEW GAS CO	1) TRIB,CRKD CK,BU DORCHEAT, 2) CRKD CK	11140203	020	14
AR0046973	MAGNOLIA COUNTRY CLUB	TRIB,HORSEHEAD CK,DORCHEAT BU,RED R	11140203	021	15
AR0047635	ALBEMARLE CORP-WEST PLANT	DISMUKES BR,BIG CK,BU DORCHEAT,RED	11140203	023	16
AR0047953	DELTIC TIMBER CORP.-WALDO MILL	TRIB,BEECH CK,LK COLUMBIA	11140203	025	17
AR0048054	QUAD HARDWOOD PRODUCTS	TRIB,BEECH CK,DORCHEAT BU,RED RV	11140203	025	18
AR0048305	STAMPS, CITY OF-SOUTH WWTF	DIT,BODCAU CK	11140205	006	19

SEGMENT 1B — RED RIVER, SULPHUR RIVER, AND McKINNEY BAYOU

Segment 1B is located in the southwest corner of the State. It includes all of Miller County and parts of Little River, Hempstead, and Lafayette Counties. Major streams within this segment are the Red River from its point of entrance into Arkansas to the Louisiana state line, the Sulphur River, and McKinney Bayou.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation and public, industrial, and agricultural water supplies. Monitored data were used as the basis of assessing 187.6 miles of stream within the segment. An additional 152.5 miles of stream were evaluated bringing the total miles of assessed streams within this segment to 340.1.

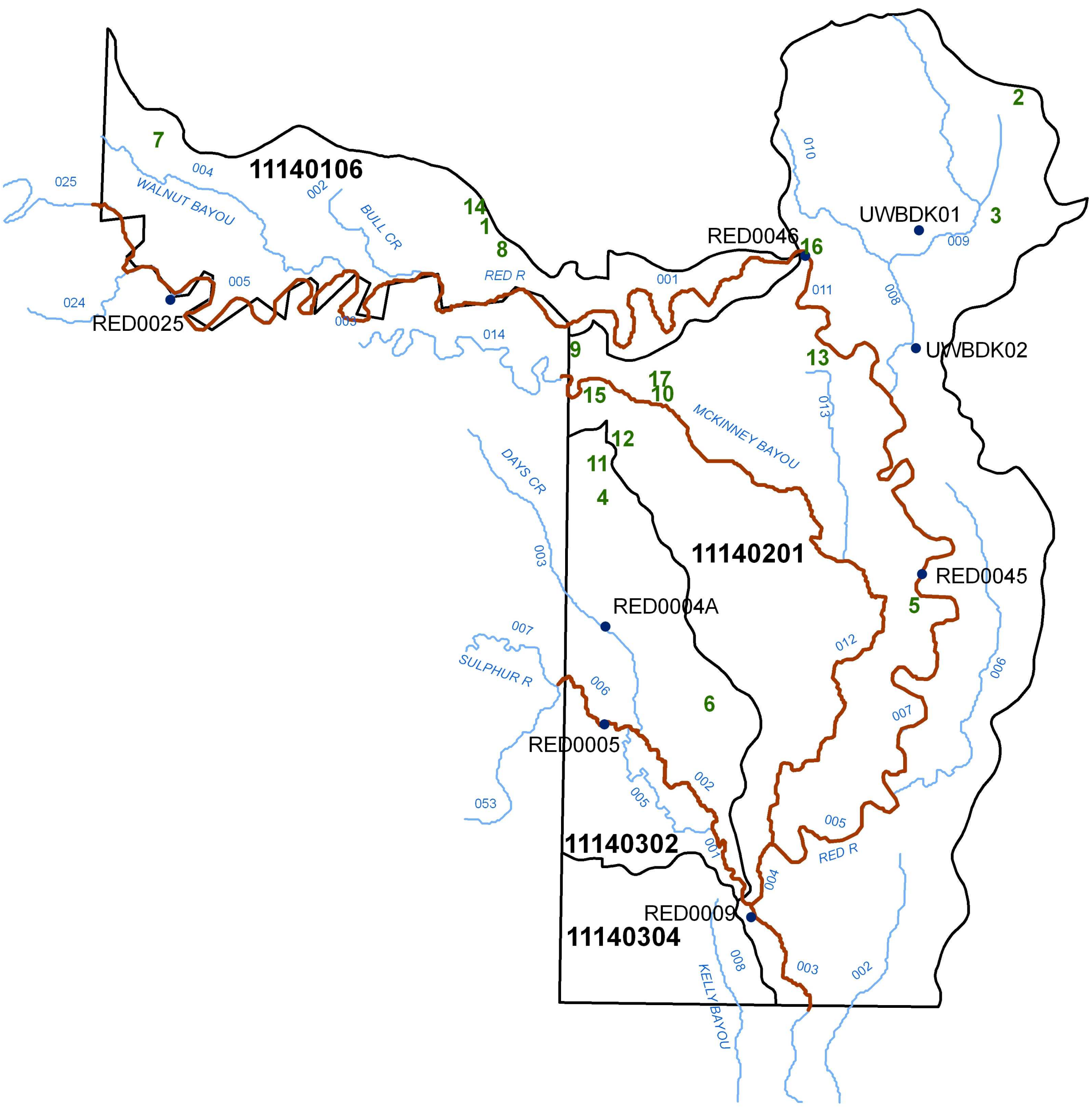
Monitored data on the Red River near its entrance into Arkansas indicates total dissolved solids, sulfate, and chloride criteria, protective of the public water supply use, are not being maintained. However, the drinking water designated use has been removed from the Red River from its point of entrance into the State to its confluence with the Little River.

Total dissolved solids and sulfate concentrations exceed the drinking water and agricultural and industrial water supply standards for McKinney Bayou. This is a reflection of the natural background conditions of the streams in the area.

Data trends for Days Creek reveal major water quality improvements in the creek as a result of the City of Texarkana's improvement of its WWTF. However, Days Creek continues not to meet the drinking water designated use due to high nitrate levels. A TMDL to address this problem was completed in early 2006.

Turbidity trend analysis from the Sulphur River indicates an increasing trend over the past 10 years from an average of about 20 NTU to over 60 NTU (Figure A-3). Turbidity concentrations the past five years have routinely been above the in stream "storm flow" standard of 32 NTU. As a result, three stream segments of the Sulphur River in Arkansas have been assessed as not attaining the aquatic life use due to excessive in stream turbidity; predominately caused by surface erosion.

Figure A-2: Planning Segment 1B



(Segment 1B)

Permitted Facilities
● Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-3: Planning Segment 1B—Designated Use Attainment Status and Water Quality Monitoring Stations

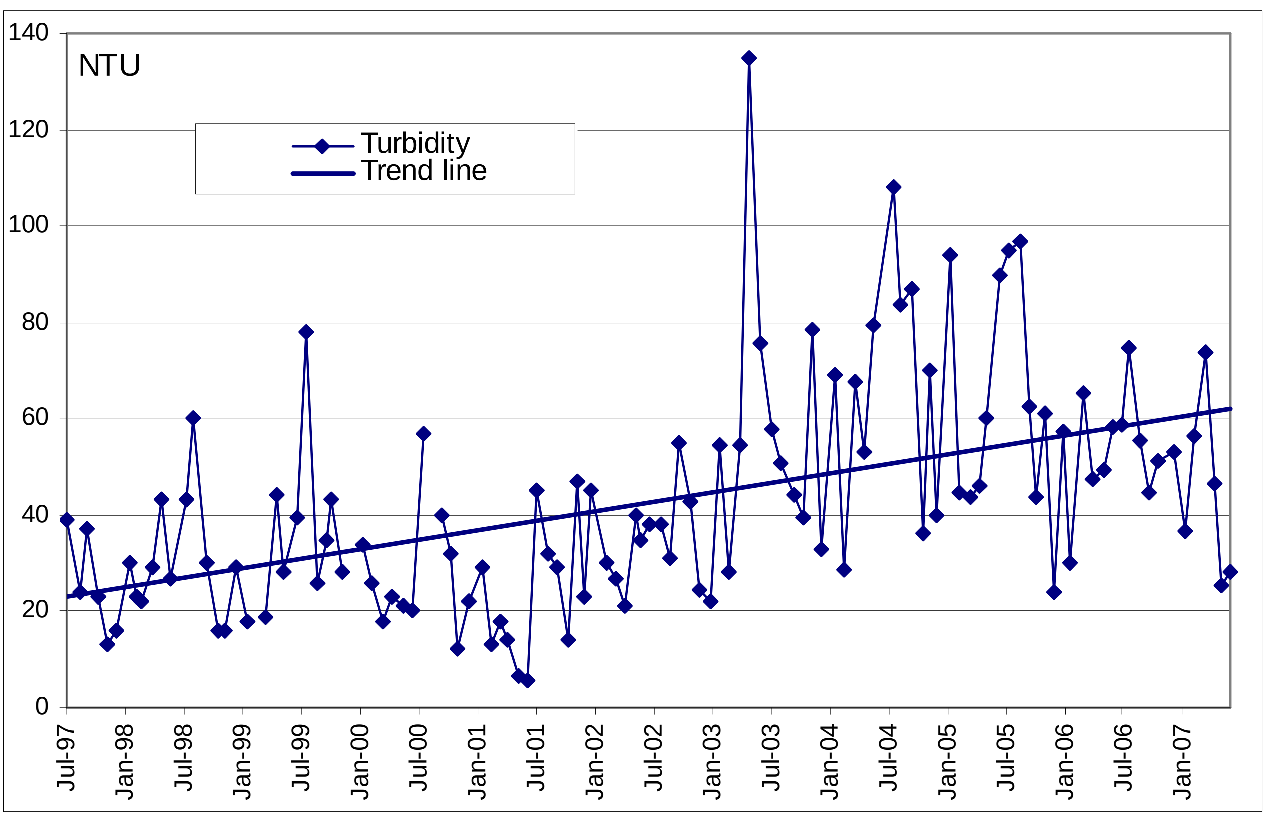
STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-1B																										
Red River	11140201	-011	15.2	RED0046	M	S	S	S	S	S	N	UN	UN			Cl	TDS			5f	5f			FISH CONSUMPTION	340.1	0.0
Red River	11140201	-007	40.1	RED0045	M	S	S	S	S	S	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f		AQUATIC LIFE	301.8	38.3
Red River	11140201	-005	12.0		E	S	S	S	S	S	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f		SWIMMING	340.1	0.0
Red River	11140201	-004	4.0		E	S	S	S	S	S	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f		SECONDARY CONTACT	340.1	0.0
Red River	11140201	-003	15.5	RED0009	M	S	N	S	S	S	N	UN	SE			TDS	SI			5f	5d			DRINKING SUPPLY	221.9	11.0
Posten Bayou	11140201	-002	18.7		E	S	S	S	S	S	S									1				AGRI & INDUSTRY	130.7	209.4
Maniece Bayou	11140201	-006	24.2		U															3						
Bois D'Arc Cr.	11140201	-008	8.9	UWBDK02	M	S	S	S	S	R	S									1						
Bois D'Arc Cr.	11140201	-009	20.4	UWBDK01	M	S	S	S	S	R	S									1						
Bridge Creek	11140201	-010	12.1		E	S	S	S	S	S	S									1						
McKinney Bayou	11140201	-012	23.1	RED0054	M	S	S	S	S	S	N	UN	UN			TDS	SO4			5d	5d					
McKinney Bayou	11140201	-014	21.6	RED0055	M	S	S	S	S	S	N	UN	UN			TDS	SO4			5d	5d					
Red Chute Creek	11140201	-013	12.5		U															3						
Sulphur River	11140302	-001	6.3		E	S	N	S	S	S	S	UN				SI	Temp			5a	5f					
Sulphur River	11140302	-002	8.5		E	S	N	S	S	S	S	UN				SI	Temp			5a	5f					
Sulphur River	11140302	-004	0.7		E	S	N	S	S	S	S	UN				SI	Temp			5a	5f					
Sulphur River	11140302	-006	6.5	RED0005	M	S	N	S	S	S	S	UN				SI	Temp			5a	5f					
Sulphur River	11140302	-008	0.8		E	S	N	S	S	S	S	UN				SI	Temp			5a	5f					
Days Creek	11140302	-003	11.0	RED0004A	M	S	S	S	S	N	S	MP				NO3				4a						
Mercer Bayou	11140302	-005	12.8		U															3						
Red River	11140106	-001	34.8		E	S	S	S	S	R	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f				
Red River	11140106	-003	9.8		E	S	S	S	S	R	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f				
Red River	11140106	-005	25.3	RED0025	M	S	S	S	S	R	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f				
Red River	11140106	-025	8.0		E	S	S	S	S	R	N	UN	UN	UN		Cl	TDS	SO4		5f	5f	5f				
Bull Creek	11140106	-002	9.3		E	S	S	S	S	S	S									1						
Walnut Bayou	11140106	-004	20.3		E	S	S	S	S	S	S									1						
Kelley Bayou	11140304	-006	7.2		E	S	S	S	S	S	S									1						
TOTAL MILES	389.6																									
MILES UNASSESSED	49.5																									
MILES EVALUATED	152.5																									
MILES MONITORED	187.6																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
RED0046	Red River at Fulton railroad bridge		1	A
RED0045	Red River at Highway 82 near Garland		1	A
RED0009	Red River near Doddridge	Y	1	A
UWBDK02	Bois D' Arc Creek on county road northwest of Center Point		2	R
UWBDK01	Bois D' Arc Creek at Highway 67 near Hope		2	R
RED0054	McKinney Bayou at Highway 296, east of Mandeville		2	R
RED0055	McKinney Bayou at Highway 134, southeast of Fouke		2	R
RED0005	Sulphur river south of Texarkana	Y	1	A
RED0004A	Days Creek southeast of Texarkana	Y	1	A
RED0025	Red River south of Foreman	Y	1	A

Table A-4: Segment 1B Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0002968	DOMTAR A.W. CORP.	PIPING & OPEN CANAL,RED RV	11140106	001	1
AR0021326	TYSON FOODS INC-HOPE PROCESSIN	DIT,CANEY CK,BOIS D'ARC CK	11140201	909	2
AR0038466	HOPE, CITY OF-BOIS D'ARC WWTP	BLACK BR,BOIS D'ARC CK,RED RV	11140201	009	3
AR0038822	COOPER TIRE & RUBBER CO-TEXARK	DIT,NIX CK,DAYS CK	11140302	003	4
AR0050857	GARLAND, CITY OF	RED RV	11140201	007	5
AR0041548	FOUKE, CITY OF	TRIB,CHICKEN CK,BOGGY CK,SULPHUR RV	11140302	003	6
AR0042846	ASH GROVE CEMENT COMPANY	FRENCH CK,WALNUT BU,RED RV	11140106	004	7
AR0042951	ASHDOWN, CITY OF	G.P. CANAL,RED RV	11140106	001	8
AR0043346	AR HWY DEPT-RED RV TOURIST CTR	RED RV	11140201	001	9
AR0044709	FLYING J TRAVEL PLAZA #5021	TRIB,BOIS D'ARC BU,RED RV	11140201	014	10
AR0046671	DOW CHEMICAL COMPANY	TRIB,OAK CK,NIX CK,DAYS CK	11140302	003	11
AR0046795	ELECTRIC COWBOY OF TEXARKANA	TRIB,MCKINNEY BU	11140201	014	12
AR0048356	TYSON FOODS INC-RIVER VALLEY A	RED RV	11140201	011	13
AR0048411	DOMTAR INDUSTRIES, INC-ASHDOWN	TRIB,HUDSON CK,LITTLE RV	11140106	001	14
AR0048691	TEXARKANA, CITY OF-NORTH WWTP	MCKINNEY BU,RED RV	11140302	014	15
AR0048810	FULTON, CITY OF	RED RV	11140201	011	16
AR0049905	RED BARN BBQ	TRIB,CLEAR LK	11140201	014	17

Figure A-3: Sulphur River (RED0005) Turbidity 10-Year Trend



SEGMENT 1C LITTLE RIVER AND TRIBUTARIES

Segment 1C is located in southwest Arkansas north of Texarkana and includes all of Sevier County and parts of Polk, Howard, Hempstead, and Little River Counties. This includes the entire reach of the Little River in Arkansas from its point of entrance into the State to its confluence with the Red River. The major tributaries include Rolling Fork, Cossatot River, Saline River, and Mine Creek. The major reservoirs located in this segment include DeQueen, Gillham, and Dierks Reservoirs, all of which drain into Millwood Reservoir.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, public, industrial and agricultural water supplies and contains ecologically sensitive waterbodies. Monitored data were used as the basis of assessing 180.3 miles of stream within this segment. An additional 150.5 miles were evaluated bring the total number of stream miles assessed 330.8 stream miles. Overall water quality is fair in the basin with the exception of several long-term problem areas.

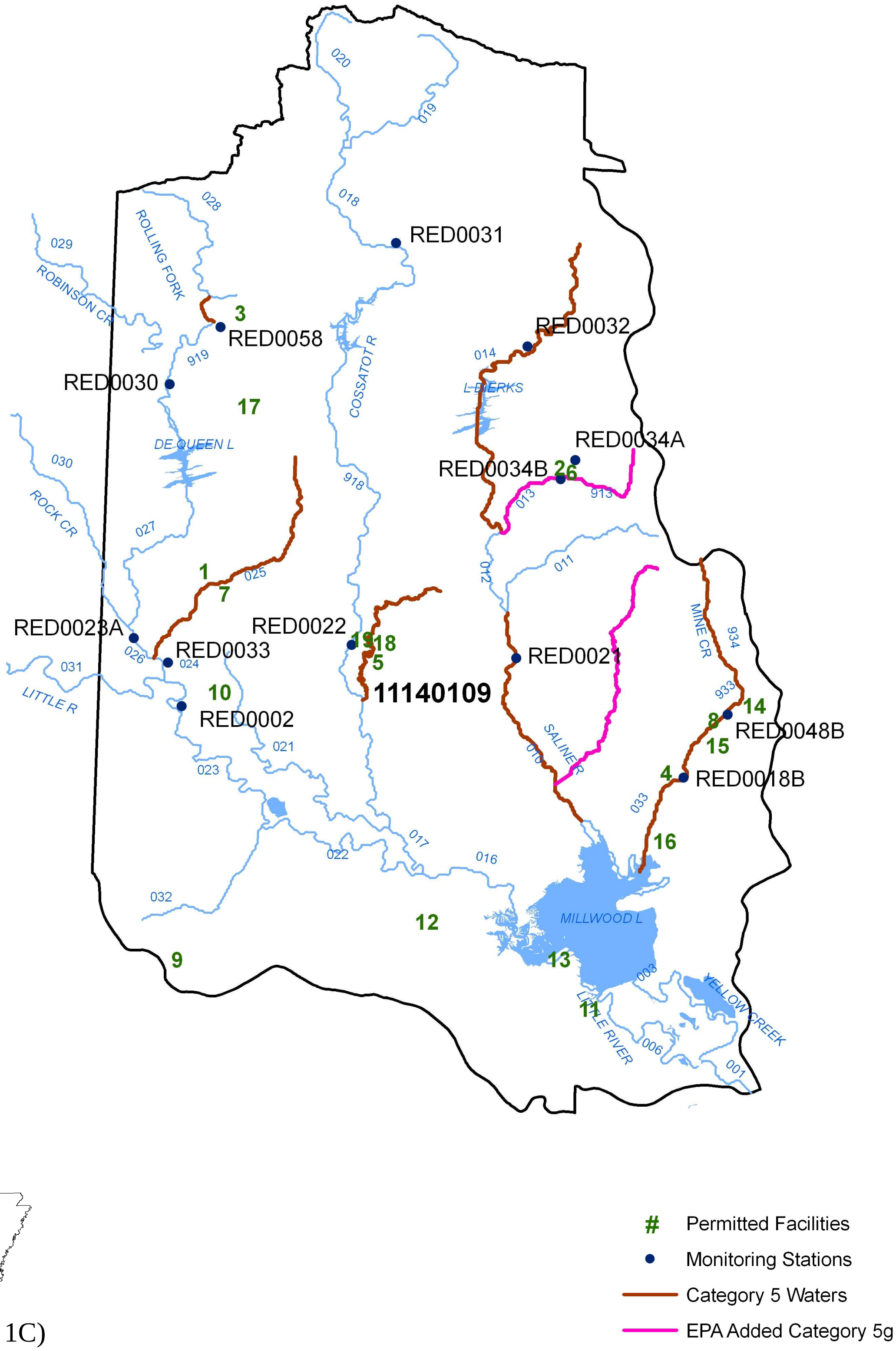
Holly Creek below Dierks is impacted by elevated levels of zinc originating from the city WWTF and/or Weyerhaeuser, Inc. discharges. Additional monitoring to accurately assess the stream segment, and/or additional point source controls are needed to address the problem.

Bear Creek has shown major improvements over the last several years, but is still impacted by elevated nutrients from the City of DeQueen effluent. Bear creek is currently listed as not attaining the drinking water use because of excessive nitrates.

The Rolling Fork River above DeQueen Reservoir has elevated nutrient concentrations (see charts RED0030 and RED0058) and has been placed on the 303(d) list for elevated copper concentrations. A TMDL addressing the nutrients was completed in 2006. Additional point source controls will be investigated to implement the TMDL and address the copper issue.

Mine Creek has elevated nutrients and metals (copper and zinc) discharged from the Tyson, Inc. plant at Nashville. Additional point source controls will be investigated to address these issues.

Figure A-4: Planning Segment 1C



(Segment 1C)

Table A-5: Planning Segment 1C—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4
SEG-1C																							
Little River	11140109	-001	4.0		U															3			
Mine Creek[1]	11140109	-934	9.1	RED0048A	M	S	S	S	S	S	S									1			
Mine Creek[2]	11140109	-933	1.3	RED0048B	M	S	N	S	S	S	S	IP	IP	IP	UN	Cu	Zn	SO4	DO	5e	5e	5e	5f
Mine Creek[3]	11140109	-033	11.4	RED0018B	M	S	S	N	S	N	S	UN	UN			SO4	PA			5d	5g		
Blue Bayou	11140109	-009	16.0	BLB0001	M	S	N	S	S	S	S	UN				PA				5g			
Saline River	11140109	-010	15.2	RED0021	M	S	N	S	S	S	S	UN				Pb				5d			
Messer Creek	11140109	-011	12.6		E	S	S	S	S	S	S									1			
Saline River	11140109	-012	6.1		E	S	S	S	S	S	S									1			
Holly Creek[4]	11140109	-913	6.7	RED0034A	M	S	S	S	S	S	S									1			
Holly Creek[5]	11140109	-013	6.2	RED0034B	M	S	N	S	S	S	S	UN				PA				5g			
Saline River	11140109	-917	8.0		E	S	S	S	S	S	S									1			
Saline River	11140109	-014	12.1	RED0032	M	S	N	S	S	S	S	UN				DO				5f			
Little River	11140109	-016	11.7		E	S	S	S	S	S	S									1			
Cossatot R.	11140109	-017	4.6		E	S	S	S	S	S	S									1			
Pond Creek	11140109	-021	23.5		E	S	S	S	S	S	S									1			
Cossatot R.	11140109	-918	37.2	RED0022	M	S	S	S	S	S	S									1			
Cossatot R.	11140109	-018	19.0	RED0031	M	S	S	S	S	S	S									1			
L. Cossatot R.	11140109	-920	12.2	LCO01	M	S	S	N	S	S	S	UN				TDS				5d			
Cossatot R.	11140109	-019	14.2		E	S	S	S	S	S	S									1			
Bushy Creek	11140109	-020	11.6		E	S	S	S	S	S	S									1			
Little River	11140109	-022	15.8		E	S	S	S	S	S	S									1			
Flat Creek	11140109	-032	10.7		U															3			
Little River	11140109	-023	17.8	RED0002	M	S	S	S	S	S	S									1			
Rolling Fork	11140109	-024	1.7		E	S	S	S	S	S	S									1			
Bear Creek	11140109	-025	17.3	RED0033	M	S	S	S	S	N	S	MP				NO3				5e			
Rolling Fork	11140109	-919	12.8	RED0058	M	S	S	N	S	S	S	IP				Cu				5a			
Rolling Fork	11140109	-026	2.7	RED0023A	M	S	S	S	S	S	S									1			
Rock Creek	11140109	-030	10.0		U															3			
Rolling Fork	11140109	-027	15.1		E	S	S	S	S	S	S									1			
Robinson Creek	11140109	-029	25.6		E	S	S	S	S	S	S									1			
Rolling Fork	11140109	-919	12.8	RED0030,58	M	S	N	S	S	S	S	IP	IP	IP		Cu	NO3	TP		5e	4a	4a	
Rolling Fork	11140109	-028	8.3		M	S	S	S	S	S	S									1			
Little River	11140109	-031	8.0		E	S	S	S	S	S	S									1			

1 Reach formally -033A
2 Reach formally -033B
3 Reach formally -033C
4 Reach formally -013A
5 Reach formally -013B

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	376.6	0
AQUATIC LIFE	313	63.6
PRIMARY CONTACT	340.2	36.4
SECONDARY CONTACT	376.6	0
DRINKING SUPPLY	347.9	28.7
AGRI & INDUSTRY	376.6	0

TOTAL MILES	401.3
MILES UNASSESSED	24.7
MILES EVALUATED	158.5
MILES MONITORED	218.1

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
RED0021	Saline River at Highway 24	Y	1	A
RED0034A	Holly Creek above Dierks		1	A
RED0034B	Holly Creek below Dierks		1	A
RED0032	Saline River at Highway 4 north of Dierks		1	A
SAL01	Saline River near Direks		2	S
SAL03	Saline River west		2	S
BLB01	Blue Bayou west of Mineral Springs		2	S
BRI01	Bridge Creek southwest of Lockesburg		2	S
CEG01	Cool Creek south of Walnut Springs		2	S
COS01	Cossatot River northwest of DeQueen		2	S
COS03	Cossatat River south of Lockesburg		2	S
RED0031	Cossatot River at Highway 4 near Wickes		1	A
RED0022	Cossatot River at Highway 24 bridge	Y	1	A
RED0002	Little River near Horatio	Y	1	A
RED0033	Bear Creek below Process City		1	A
RED0033B	Bear Creek at Highway 24 near Horatio		2	A
RED0023A	Rolling Fork River at county road north of Highway 24	Y	1	A
RED0030	Rolling Fork River above Dequeen Reservoir		1	A
RED0058	Rolling Fork River near Grannis		1	A
RED0018B	Mine Creek at Highway 355 above Tyson effluent		1	A
RED0048A	Mine Creek at Highway 27 bypass above Tyson effluent		2	A
RED0048B	Mine Creek near Nashville below Tyson effluent		1	A
RED0051	City of Nashville effluent		2	S
DIL0001	Dillard creek at Highway 27 south of Nashville		2	S
MIN0002	Mine Creek 1.4 miles west of Tollerre		2	S

Table A-6: Segment 1C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0002909	WEYERHAEUSER CO-DEQUEEN WOOD	BEAR CK,ROLLING FRK,LT RED RV	11140109	025	1
AR0002917	WEYERHAEUSER DIERKS	HOLLY CK,SALINE RV,RED RV	11140109	013B	2
AR0003018	TYSON FOODS INC-GRANNIS PROCES	TRIB,ROLLING FORK RV,LITTLE RV,RED	11140109	919	3
AR0021261	MINERAL SPRINGS, CITY OF	MINE CK,LITTLE RV	11140109	033C	4
AR0021377	LOCKESBURG, CITY OF	LTL COSSATOT RV TRIB	11140109	918	5
AR0021709	DIERKS, CITY OF	HOLLY CK,SALINE RV,LITTLE RV,RED RV	11140109	013B	6
AR0021733	DEQUEEN, CITY OF	DIT,BEAR CK,LITTLE RV	11140109	025	7
AR0021776	NASHVILLE, CITY OF	MINE CK,MILLWOOD LK,LITTLE RV,RED R	11140109	033C	8
AR0023817	FOREMAN, CITY OF	E FLAT CK,FLAT CK,LITTLE RV,RED RV	11140109	032	9
AR0035785	HORATIO, CITY OF	TRIB,POND CK,COSSATOT RV,LITTLE RV	11140109	021	10
AR0037079	ARK PARKS MILLWOOD DAM PARK	TRIB,BUSTER CK,LITTLE RV,RED RV	11140109	006	11
AR0040886	WILTON, TOWN OF	TRIB,LICK CK,MILLWOOD LK,LITTLE RV	11140109	016	12
AR0041246	MILLWOOD WATER CORP	TRIB (LK MILLWOOD),LITTLE RV,RED RV	11140109	006	13
AR0041734	TYSON FOODS, INC.-NASHVILLE	MINE CK,MILLWOOD LK,LITTLE RV,RED R	11140109	033B	14
AR0041769	DALTON MOBILE HOME PARK	TRIB,MINE CK,MILLWOOD LK	11140109	033C	15
AR0045144	TOLLETTE, CITY OF	MINE CK,MILLWOOD LK,LITTLE RV,RED R	11140109	033C	16
AR0047996	GILLHAM REGIONAL WW DISTRICT	BELLAH CK,DEQUEEN LK,ROLLING FK CK	11140109	027	17
AR0048593	BRUCE KENNEDY SAND & GRAVEL CO	TRIB,MILL SLU,COSSATOT R, LITTLE R	11140109	918	18
AR0049034	CROW AGGREGATES LTD., CO.	SLU,LTL COSSATOT,COSSATOT RV,LTL RV	11140109	918	19

SEGMENT 1D MOUNTAIN FORK AND TRIBUTARIES

This segment is located on the western edge of Arkansas County and covers a portion of Polk County. It encompasses a 20-mile reach of the Mountain Fork of Little River from its headwaters to the Arkansas-Oklahoma state line.

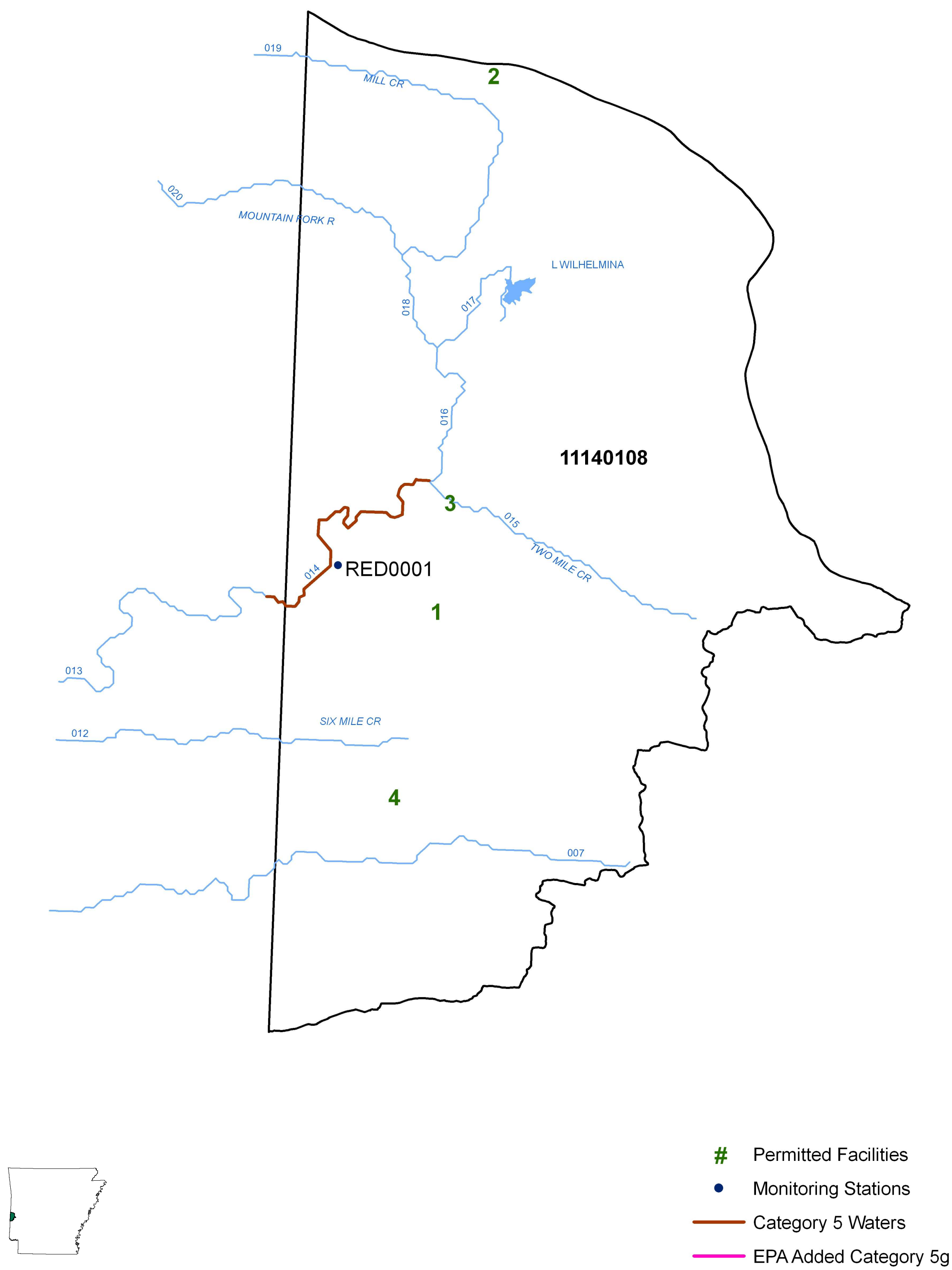
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation and public, industrial, and agricultural water supplies. The Mountain Fork River also is designated as an extraordinary resource water and an ecologically sensitive waterbody because of the occurrence of the leopard darter in this basin. Monitored data were used for assessing 11 miles of stream within this segment and an additional 36.3 stream miles were evaluated.

The temperature standard in the Mountain Fork is routinely exceeded during the low-flow season. This usually occurs when the ambient day-time air temperatures reach into the upper nineties and in stream flow is reduced to the 7_Q10 flow of less than 1 cubic foot per second. The in stream habitat in Mountain Fork is a typical Ouachita Mountains a step-pool habitat. This creates shallow, wide pools between short runs. These wide pools reduce the percent canopy of the stream. All of these factors influence the natural occurring in stream water temperature during the critical season.

It is also evident that a 10 percent exceedance rate of a water quality standard to determine attainment of a designated use may not always be appropriate. There have been 13 exceedances out of 100 samples of the temperature standard at RED0001 during the past 10 years (Figure A-6). This equates to a 13 percent exceedance rate, or 1.3 exceedances per year. This is most likely not impairing any of the designated uses in the stream.

Figure A-5: Planning Segment 1D



(Segment 1D)

Table A-7: Planning Segment 1D—Designated Use Attainment Status and Water Quality Monitoring Stations

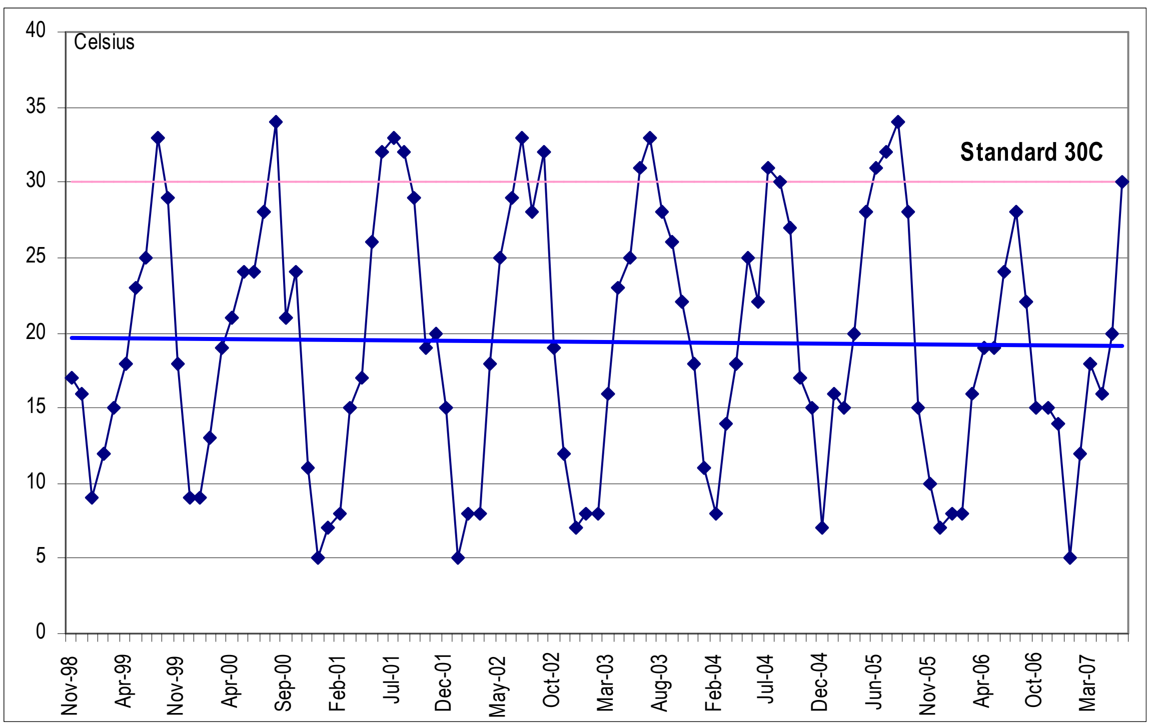
STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-1D																										
Buffalo Creek	11140108	-007	9.5		U															3				FISH CONSUMPTION	47.3	0
Sixmile Creek	11140108	-012	4.1		U															3				AQUATIC LIFE	36.3	11
Mountain Fork	11140108	-014	11.0	RED0001	M	S	N	S	S	S	S	UN				Temp				5f				PRIMARY CONTACT	47.3	0
Twomile Creek	11140108	-015	8.1		E	S	S	S	S	S	S									1				SECONDARY CONTACT	47.3	0
Mountain Fork	11140108	-016	4.5		E	S	S	S	S	S	S									1				DRINKING SUPPLY	47.3	0
Mountain Fork	11140108	-018	2.8		E	S	S	S	S	S	S									1				AGRI & INDUSTRY	47.3	0
Powell Creek	11140108	-017	4.7		E	S	S	S	S	S	S									1						
Mill Creek	11140108	-019	12.2		E	S	S	S	S	S	S									1						
Mountain Fork	11140108	-020	4.0		E	S	S	S	S	S	S									1						
TOTAL MILES	60.9																									
MILES UNASSESSED	13.6																									
MILES EVALUATED	36.3																									
MILES MONITORED	11																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
RED0001	Mountain Fork near Hatfield	Y	1	A

Table A-8: Segment 1D Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0035483	HATFIELD, CITY OF	JOSHLING CK,MOUNTAIN FORK RV	11140108	014	1
AR0037605	AR PARKS & TOURISM-QUEEN WILHE	TRIB,MILL CK,MTN FRK OF LITTLE RV	11140108	019	2
AR0046787	BOY SCOUTS OF AMERICA-CAMP PIO	TWO MILE CK,MOUNTAIN FORK RV	11140108	015	3
AR0049247	COVE, CITY OF	BUFFALO CK,MOUNTAIN FORK RV,RED RV	11140108	007	4

Figure A-6: Mountain Fork (RED0001) Water Temperature



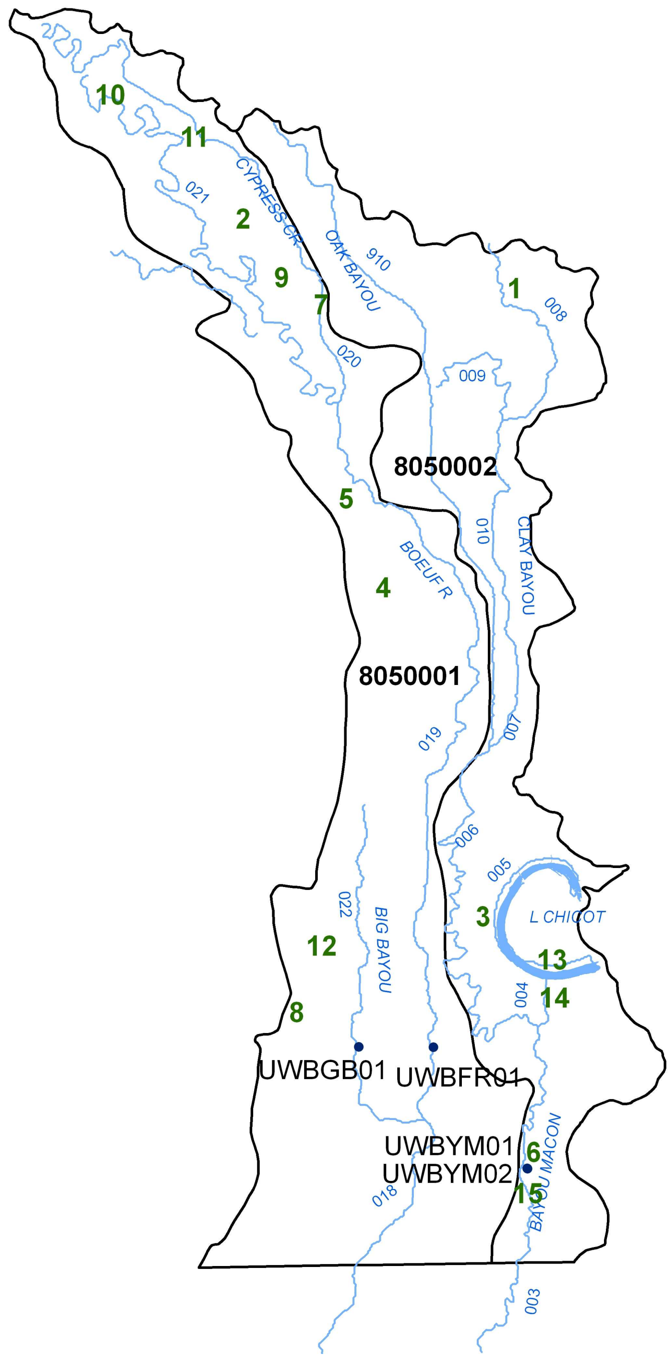
SEGMENT 2A BOEUF RIVER AND TRIBUTARIES

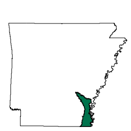
This segment is located in the extreme southeastern corner of Arkansas. It includes most of Chicot and Desha Counties, the northeastern part of Lincoln County, and small areas of Drew, Ashley, and Jefferson Counties. Major streams within this segment include the Boeuf River and its tributaries; Macon Bayou, Cypress Creek, Big Bayou, Oakwood Bayou, and others. The flows are generally southward into Louisiana. Row crop agriculture is the dominant land use in this watershed.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. The majority of the waters in this segment have been severely altered by channelization, ditching, and rerouting the drainage patterns. Monitored data were used as the basis of assessing 413.6 miles of stream within this segment. An additional 50.6 miles were evaluated bring the total number of miles assessed with in this segment to 464.2 stream miles.

Figure A-7: Planning Segment 2A





(Segment 2A)

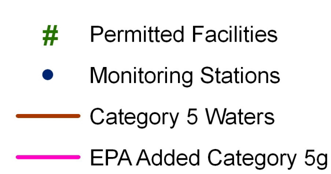


Table A-9: Planning Segment 2A—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-2A																										
Boeuf River	8050001	-018	49.4	OUA0015A	M	S	N	S	S	S	S	AG	AG	AG		SI	SO4	CL		4a	4a	4a		FISH CONSUMPTION	464.2	0
Boeuf River	8050001	-019	58.1	UWBFR01	M	S	S	S	S	S	S									1				AQUATIC LIFE	396.5	67.7
Big Bayou	8050001	-022	27.1	UWBGB01,+	M	S	S	S	S	S	S									1				PRIMARY CONTACT	464.2	0
Cypress Creek	8050001	-020	47.5	OUA0180	M	S	S	S	S	S	S									1				SECONDARY CONTACT	464.2	0
Choctaw Bayou	8050001	-021	58.9	OUA0181	M	S	S	S	S	S	S									1				DRINKING SUPPLY	464.2	0
Macon Bayou	8050002	-003	80.5	UWBYM01	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	464.2	0
Ditch Bayou	8050002	-004	4.0	OUA0172	M	S	S	S	S	S	S									1						
Macon Bayou	8050002	-006	38.6		E	S	S	S	S	S	S									1						
Clay Ditch	8050002	-007	24.3	OUA0173	M	S	S	S	S	S	S									1						
Boggy Creek	8050002	-009	12.0		E	S	S	S	S	S	S									1						
Oak Bayou[1]	8050002	-910	18.3	OUA0179+	M	S	N	S	S	S	S	AG	AG	AG		SI	CL	TDS		4a	4a	4a				
Canal No. 43[2]	8050002	-010	28.5	OUA0174	M	S	S	S	S	S	S									1						
Red Fork Creek	8050002	-008	17.0	OUA0177	M	S	S	S	S	S	S									1						
TOTAL MILES	464.2																									
MILES UNASSESSED	0																									
MILES EVALUATED	50.6																									
MILES MONITORED	413.6																									

1 Reach formally -010U
2 Reach formally -010L

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
OUA0015A	Boeuf River near Arkansas-Louisiana State line	Y	1	A
UWBFR01	Boeuf River at Highway 278, 4 miles west of Chicot		2	R
OUA0032	Big Bayou at Highway 144 near Jerome		2	R
UWBGB01	Big Bayou at Highway 278, 5 miles east of Portland		2	R
OUA0180	Cypress Creek on county road off Highway 277 southwest of Dumas		2	R
OUA0181	Choctaw Bayou at county road southwest of Dumas		2	R
UWBYM01	Macon Bayou at Highway 65 near Eudora		2	R
OUA0172	Ditch Bayou at AGFC access off US 82 near Lake Village		2	R
OUA0173	Clay Bayou at Highway 35		2	R
OUA0175	Macon Bayou at Highway 1 near McArthur		2	R
OUA0176	Amos Bayou off Highway 1 near Rohwer		2	R
OUA0174	Canal No. 43, Amos Bayou, at Highway 35		2	R
OUA0179	Oak Bayou at Highway 277 southeast of Dumas		2	R
OUA0177	Red Fork Bayou on county road northeast of Kelso		2	R
OUA0178	Oak Log Bayou at county road off Highway 277 southeast of Dumas		2	R
			2	R

Table A-10: Segment 2A Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021610	WATSON, CITY OF	RED FORK BU,BOGGY BU,CLAY BU	08050002	008	1
AR0021679	GOULD, CITY OF	TRIB,KERCH CAN,CYPRESS CK	08050001	020	2
AR0021849	LAKE VILLAGE, CITY OF	LTL LAKE BU,BU MACON,BOEUF RV	08050002	006	3
AR0022071	MCGEHEE, CITY OF	BU BARTHOLOMEW,OUACHITA RV	08050001	019	4
AR0033707	TILLAR, CITY OF	CAN #18,MACON BU,BOEUFF RV	08050001	019	5
AR0033839	EUDORA, CITY OF	BU MACON,OUACHITA RV	08050002	003	6
AR0033987	DUMAS, CITY OF	CAN #19,BU MACON,OUACHITA RV	08050001	020	7
AR0034371	PORTLAND, CITY OF	TRIB,BU BARTHOLOMEW,OUACHITA RV	08040205	002	8
AR0037125	MITCHELLVILLE, CITY OF	CAN #19,AMOS BU,MACON BU	08050002	020	9
AR0039381	GRADY, CITY OF	CAN #19,BU MACON,BOEUF RV,OUACHITA	08050001	020	10
AR0040827	AR DEPT OF CORRECTION-CUMMINS	CAN #19	08050002	020	11
AR0041297	MONTROSE, CITY OF-WASTE WATER	TRIB WARDS BU,BIG BU,BOEUF RV	08050001	022	12
AR0050008	CHICOT COUNTY PARK	LK CHICOT,DITCH BU,MACON BAYOU,...	08050002	004	13
AR0050091	CHICOT COUNTY-DITCH BAYOU BOAT	DITCH BU,BU MACON	08050002	004	14
AR0050580	HARVEST SELECT CATFISH EUDORA	BU MACON,OUACHITA RV	08050002	003	15

SEGMENT 2B BAYOU BARTHOLOMEW AND TRIBUTARIES

Segment 2B, located in the southeastern part of Arkansas and drains portions of Jefferson, Lincoln, Drew, and Ashley Counties and very small portions of Cleveland, Desha, and Chicot Counties. The major streams in this segment are Bayou Bartholomew, Ables Creek, Cutoff Creek, Deep Bayou, and their tributaries.

Summary of Water Quality Conditions

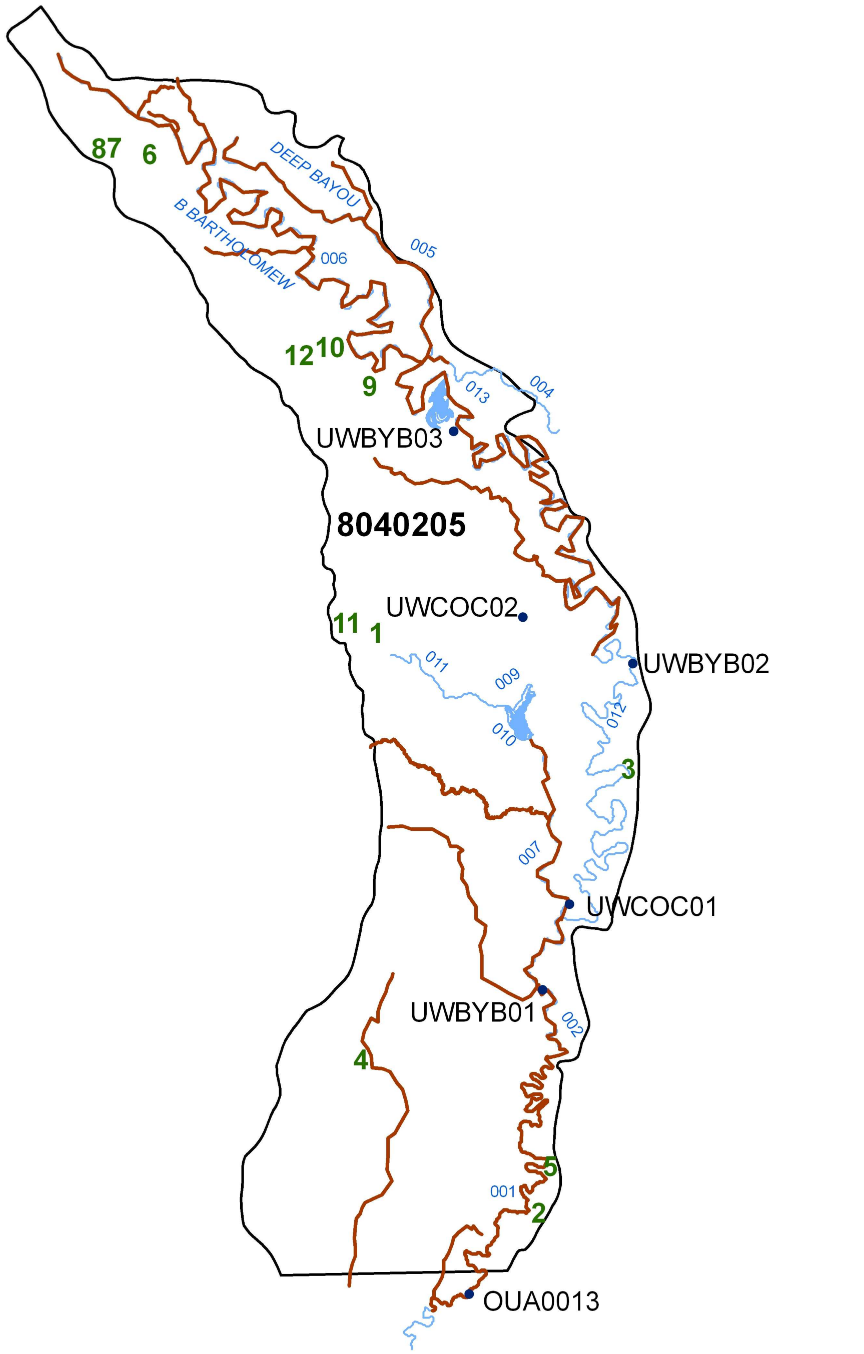
The waters within this segment have been designated as suitable for the propagation of fish, wildlife, primary and secondary contact recreation, as well as public, industrial, and agricultural water supplies. This segment contains a total of 453.5 stream miles, all of which are being assessed using monitoring data.

Water quality is impacted in much of this segment by nonpoint pollution generated by row crop agriculture. Silt loads and turbidity are consistently very high, thus causing degradation to the aquatic life within many of these streams. Over the past 10 years, the Bayou Bartholomew Alliance has been addressing these concerns through the implementation of best management practices on a watershed scale. Even though the 10-year trend analysis for turbidity at OUA0013 indicates an increasing trend, the 5 year trend analysis, which might better reflect the recent implementation of best management practices, indicates a noticeable decline in the in stream turbidity in Bayou Bartholomew.

Historically, fecal coliform data were used to list several streams as impaired for primary contact recreation. Recently, at the request of USEPA, ADEQ adopted *Escherichia coli* as the assessment parameter for primary contact recreation into the State’s water quality regulations.

Additional data will be developed to better assess the primary contact recreation use in these streams.

Figure A-8: Planning Segment 2B



(Segment 2B)

Table A-11: Planning Segment 2B—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-2B																										
B. Bartholomew	8040205	-001	60.1	OUA0013	M	S	N	S	S	S	S	AG	AG			Zn	SI			5d	4a			FISH CONSUMPTION	429.6	59.7
Wolf Creek	8040205	-701	10.8	OUA0156	M	S	N	S	S	S	S	UN				DO				5f						
B. Bartholomew	8040205	-002	17.9	OUA0154	M	N	N	S	S	S	N	AG	AG	UN		DO	SI	Hg		5f	5a	4a		AQUATIC LIFE	22.7	466.6
Bearhouse Creek	8040205	-901	24.4	OUA0155	M	S	N	S	S	S	S	UN	UN	UN		PA	Pb	DO		5d	5d	5f		PRIMARY CONTACT	396	93.3
B. Bartholomew	8040205	-006	82.3	OUA0033	M	S	N	S	S	S	S	UN	AG	AG		DO	SI	Pb		5f	4a	5d		SECONDARY CONTACT	482.3	7
Main Street Ditch	8040205	-909	2.0	OUA0146	M	S	N	S	S	S	S	UR	UR	UN		Cu	Pb	DO		5d	5d	5f		DRINKING SUPPLY	474.7	14.6
Harding Creek	8040205	-902	4.6	OUA0145	M	S	N	S	N	S	S	UR	UR	UR	UR	PA	Cu	Pb	Zn	5d	5d	5d	5d	AGRI & INDUSTRY	354.8	134.5
Nevins Creek	8040205	-906	8.5	OUA0144	M	S	S	S	S	S	S									1						
Bayou Imbeau	8040205	-910	7.5	OUA0147	M	S	N	S	S	S	S	UR	UN			Pb	DO			5d	5f					
Melton's Creek	8040205	-903	8.7	OUA0148	M	S	N	S	S	S	S	UN				PA				5d						
Deep Bayou	8040205	-005	28.9	OUA0151	M	S	N	N	S	S	S	AG	AG			PA	SI			5d	4a					
Jacks Bayou	8040205	-904	6.0	OUA0150	M	S	N	S	S	S	S	UN				DO				5f						
Cross Bayou	8040205	-905	2.4	OUA0152	M	S	S	S	N	S	S	UN				PA				5d						
Able's Creek	8040205	-911	14.6	OUA0158	M	S	N	S	S	N	S	UN	UN			Be	SI			5d	5d					
B. Bartholomew[1]	8040205	-912	82.7		E	S	N	S	S	S	N	AG	AG	UN	AG	CL	TDS	DO	SI	5d	5d	5f	4a			
B. Bartholomew	8040205	-012	25.0	UWBYB02	M	N	N	S	S	S	S	AG	UN			SI	Hg			4a	4a					
B. Bartholomew	8040205	-013	33.9	UWBYB03	M	S	N	N	S	S	N	UN	AG	AG	AG	DO	TDS	PA	Pb	5f	5d	5d	5d			
Cutoff Creek	8040205	-007	16.8	UWCOC01	M	N	N	S	S	S	S	UN	UN	UN		SI	DO	Hg		5d	5f	4a				
Cutoff Creek	8040205	-011	11.8	UWCOC02	M	S	S	S	S	S	S									1						
Chemin-A-Haut Creek	8040205	-907	30.5	OUA0012	M	S	N	N	S	S	S	UN	UN			PA	DO			5d	5f					
Overflow Creek	8040205	-908	9.9	OUA0012A	M	S	N	S	S	S	S	UN	UN			SI	Cl			5d	5d					
TOTAL MILES	489.3																									
MILES UNASSESSED	0																									
MILES EVALUATED	82.7																									
MILES MONITORED	406.6																									

AL = TMDL for silt

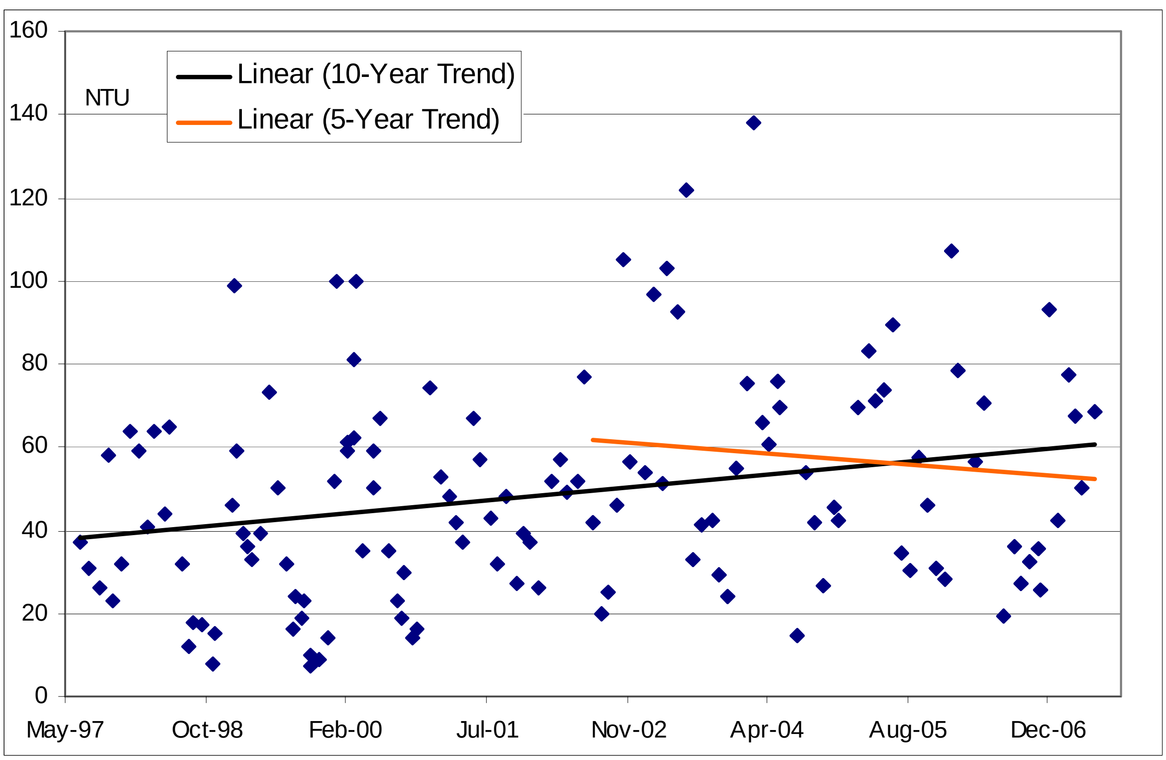
1 Reach formally -012U

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
OUA0013	Bayou Bartholomew near Jones Louisiana	Y	1	A
OUA0154	Bayou Bartholomew at Highway 278 west of Portland		2	S
OUA0155	Bearhouse Creek at county road 75, north of Snyder		2	S
OUA0033	Bayou Bartholomew near Ladd	Y	1	A
OUA0145	Harding Creek on Oak Wood road in Pine Bluff		2	S
OUA0148	Melton's Creek on county road 2 miles south of Tarry		2	S
OUA0151	Deep Bayou at Highway 11, 3 miles south of Grady		2	S
OUA0152	Cross Bayou on county road 2 miles south of Highway 114 near Fresno		2	S
UWBYB02	Bayou Bartholomew at Highway 4 near McGehee		2	R
UWBYB01	Bayou Bartholomew at Highway 82 near Thebes		2	R
UWBYB03	Bayou Bartholomew at Highway 54 at Garrett Bridge		1	A
OUA0144	Nevins Creek on Good Faith road in Pine Bluff		2	S
UWCOC01	Cut-Off Creek near Boydell		2	R
UWCOC02	Cut-Off Creek at Highway 4 east of Monticello		2	R
OUA0012	Overflow Creek at Louisiana Highway 590 in Morehouse Parish		2	R
OUA0012A	Chemin-A-Haut Creek at Louisiana Highway 834 in Morehouse Parish		2	R

Table A-12: Segment 2B Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021831	MONTICELLO, CITY OF-EAST PLANT	TRIB,GODFREY CK,LOWER CUTOFF CK,...	08040205	011	1
AR0022144	WILMOT, CITY OF	BU BARTHOLOMEW,OUACHITA RV	08040205	001	2
AR0022250	DERMOTT, CITY OF-SOUTH POND	BU BARTHOLOMEW,OUACHITA RV	08050001	012	3
AR0034029	HAMBURG, CITY OF	CHEMIN-A-HAUT CK,OUACHITA RV	08040205	907	4
AR0037141	PARKDALE, CITY OF	BU BARTHOLOMEW	08040205	001	5
AR0037885	SUBURBAN SID NO. TANTARA #1 OF	BOGGY BU,BU BARTHOLOMEW,ARKANSAS RV	08040205	006	6
AR0039144	PINEWOOD SEWER IMPROVEMENT	TRIB,NEVINS CK,BU BARTHOLOMEW	08040205	006	7
AR0041602	SUBURBIA SID #1	NEVIN CK,BU BARTHOLOMEW	08040205	006	8
AR0045888	ARK PARKS CANE CREEK	CANE CK,BU BATHOLOMEW,OUACHITA RV	08040205	006	9
AR0046477	STAR CITY, CITY OF	CANE CK,BU BARTHOLOMEW,OUACHITA RV	08040205	006	10
AR0047350	PINE HAVEN MOBILE LODGE	TRIB,GODFREY CK,CUTOFF CK,BU BARTHO	08040205	011	11
AR0047872	ROBERT FLOYD SAWMILL, INC	TRIB,CANE CK,BU BARTHOLOMEW	08040205	006	12

Figure A-9: Bayou Bartholomew (OUA0013) Turbidity 5- & 10-Year Trends



SEGMENT 2C SALINE RIVER AND TRIBUTARIES

Segment 2C is located in south central Arkansas and covers parts of Saline, Garland, Hot Spring, Grant, Dallas, Jefferson, Cleveland, Lincoln, Drew, Bradley, and Ashley Counties. This segment contains the Saline River drainage system from its headwaters in the Ouachita Mountains to its confluence with the Ouachita River. The principal tributaries are Hurricane Creek, Hudgins Creek, L'Aigle Creek, Derrieusseaux Creek, and the four forks of the upper Saline River.

Summary of Water Quality Conditions

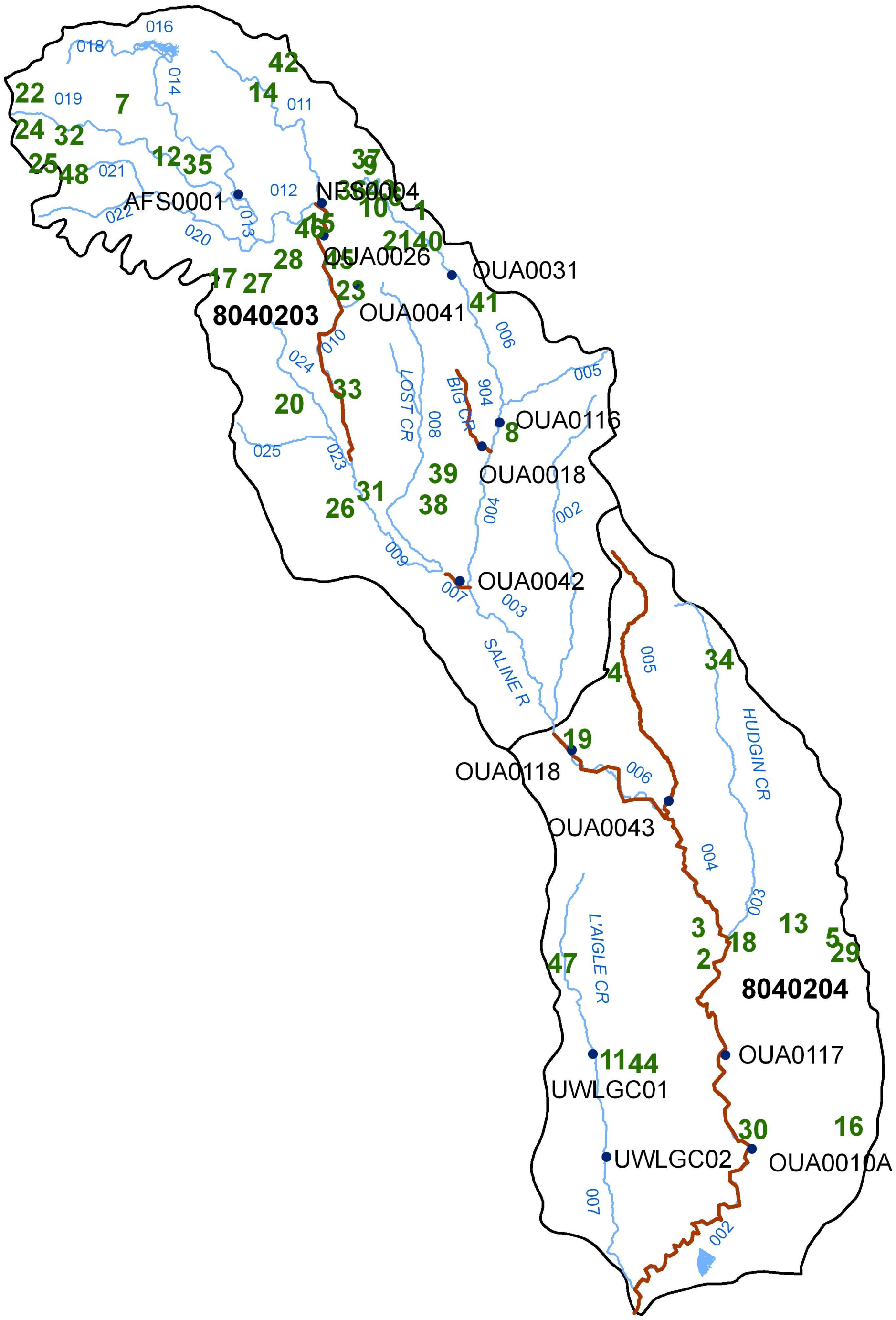
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. Slightly over one-half of the total stream miles within this segment are designated as extraordinary resource waters. This includes the Saline River and its primary headwater tributaries. Monitored data were used to assess 367.8 miles of stream and another 208.5 miles were evaluated

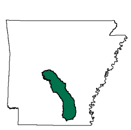
The domestic water supply use has been removed from 83.8 miles in the Hurricane Creek sub-watershed because of excessive mineral content. Mineral content (chlorides, sulfates, and other dissolved minerals) originates in this basin from open pit bauxite mining activities

Water quality in Big Creek below the City of Sheridan effluent has improved, yet dissolved oxygen violations still occur as well as elevated BOD and TOC levels. A TMDL was completed for dissolved oxygen (D.O.) in Big Creek in 2007. This stream is classified as a seasonal fishery and the critical season D.O. standard is 2 mg/L to prevent nuisance conditions. Many small seasonal streams in this ecoregion have D.O. levels below 2 mg/L during the critical season.

A fish consumption advisory has been placed on much of the lower Saline River because of mercury contamination. A TMDL was completed in September 2002 for these waters.

Figure A-10: Planning Segment 2C





(Segment 2C)

Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Figure A-11: Planning Segment 2C

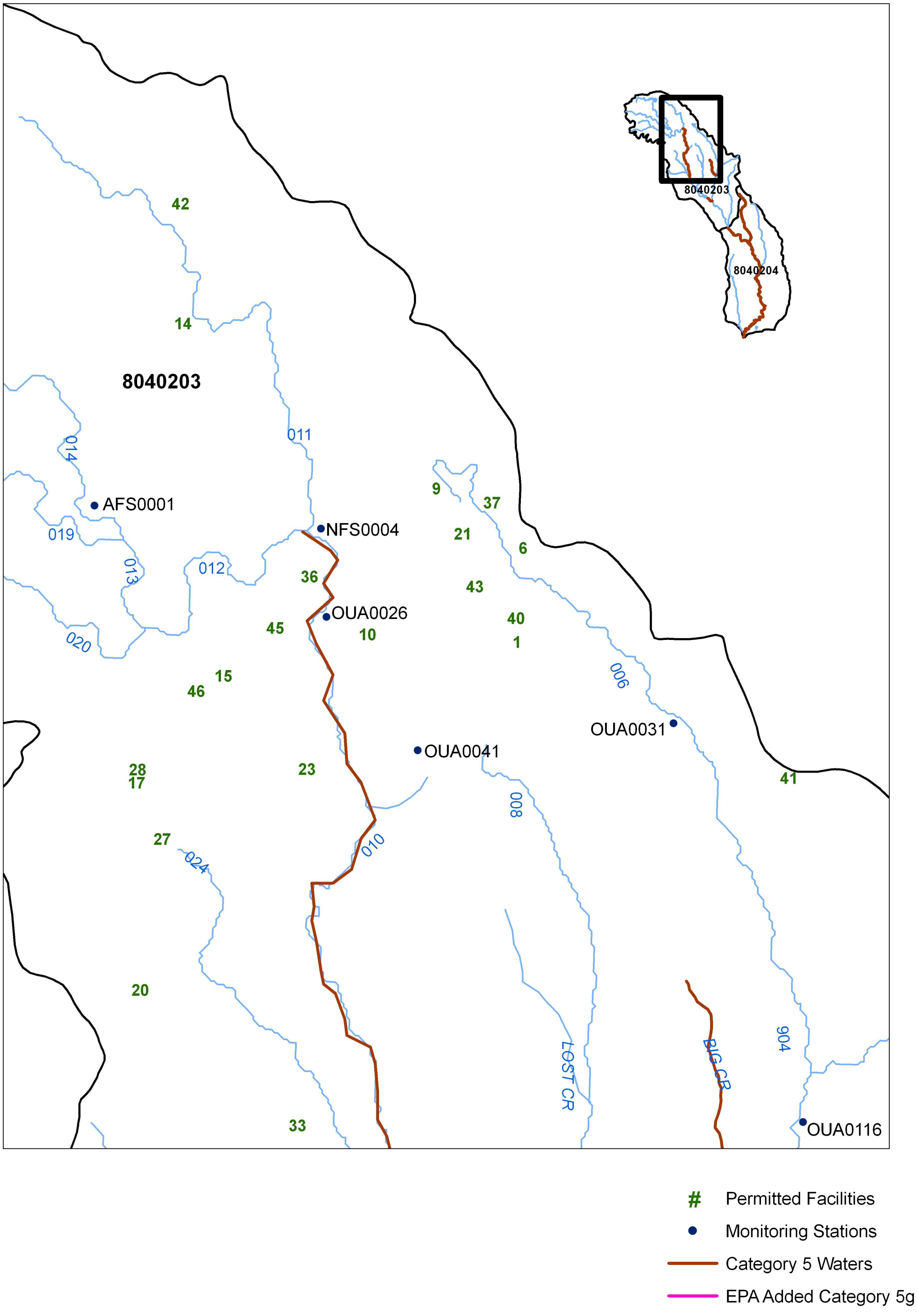


Table A-13: Planning Segment 2C—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-2C																										
Saline River	8040203	-001	0.2		E	N	S	S	S	S	S	UN				Hg				4a				FISH CONSUMPTION	437.3	89.9
Derrieusseaux	8040203	-002	34.3	OUA0166	E	S	S	S	S	S	S									1				AQUATIC LIFE	386.3	140.9
Saline River	8040203	-003	17.2		E	S	S	S	S	S	S									1				PRIMARY CONTACT	527.2	0
Hurricane Cr.	8040203	-004	19.5	OUA0116	M	S	S	S	S	S	S									1				SECONDARY CONTACT	527.2	0
Simpson Creek	8040203	-005	12.3		E	S	S	S	S	S	S									1				DRINKING SUPPLY	414	113.2
Hurricane Cr.	8040203	-006	30.8	OUA0031	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	407.7	119.5
Saline River	8040203	-007	3.8	OUA0042	M	S	S	S	S	N	S	UN				Be				5d						
Lost Creek	8040203	-008	33.5		U															3						
Saline River	8040203	-009	15.6		U															3						
Saline River	8040203	-010	29.8	OUA0026,41	M	S	N	S	S	S	N	SE	UN			SI	TDS			5a	5a					
N. Fork Saline	8040203	-011	23.2	NFS01	M	S	S	S	S	S	S									1						
Saline River	8040203	-012	10.2		E	S	S	S	S	S	S									1						
Saline River	8040203	-013	4.0		E	S	S	S	S	S	S									1						
Alum Fork	8040203	-014	24.6	AFS01	M	S	S	S	S	S	S									1						
Alum Fork	8040203	-015	3.2		E	S	S	S	S	S	S									1						
Alum Fork	8040203	-018	10.0		E	S	S	S	S	S	S									1						
M. Fork Saline	8040203	-019	30.9	MFS01	M	S	S	S	S	S	S									1						
S. Fork Saline	8040203	-020	14.9	SFS01	M	S	S	S	S	S	S									1						
Cedar Creek	8040203	-021	9.1		E	S	S	S	S	S	S									1						
S. Fork Saline	8040203	-022	10.9		E	S	S	S	S	S	S									1						
Francois Cr.	8040203	-023	2.9		E	S	S	S	S	S	S									1						
Francois Cr.	8040203	-024	14.9		E	S	S	S	S	S	S									1						
Huskey Creek	8040203	-025	11.0		E	S	S	S	S	S	S									1						
Big Creek	8040203	-904	10.0	OUA0018	M	S	N	S	S	N	S	SE	UN	UN	MP	SI	Pb	Be	OE	5a	5d	5d	4a			
Saline River	8040204	-001	2.8		E	N	N	S	S	S	N	UN	UN			Cu	TDS			5d	5d					
Saline River	8040204	-002	53.0	OUA0010A,117	M	N	N	S	S	N	N	UN	UN	UN	UN	Cu	Be	TDS	Pb	5d	5d	5d	5g			
Saline River	8040204	-004	16.4		E	N	N	S	S	S	N	UN	UN			Cu	TDS			5d	5d					
Saline River	8040204	-006	17.5	OUA0118	M	N	S	S	S	N	N	UN	UN			Be	TDS			5d	5d					
Hudgens Creek	8040204	-003	36.7	OUA0167	M	S	S	S	S	S	S									1						
Big Creek	8040204	-005	28.9	OUA0043	M	S	N	S	S	N	S	SE	UN	UN		SI	Be	pH		5d	5d	5f				
L'Aigle Creek	8040204	-007	44.2	UWLGC01,02	M	S	S	S	S	S	S									1						
TOTAL MILES	576.3																									
MILES UNASSESSED	49.1																									
MILES EVALUATED	159.4																									
MILES MONITORED	367.8																									

FC = TMDL for Hg

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
OUA0166	Derrieusseaux Creek at Highway 35 northwest of Rison		2	R
OUA0116	Hurricane Creek at Highway 270 bridge	Y	1	A
OUA0031	Hurricane Creek near Sardis	Y	1	A
OUA0042	Saline River at Highway 167 near Sheridan	Y	1	A
OUA0026	Saline River near Benton	Y	1	A
OUA0041	Saline River at Shaw Bridge south of Benton	Y	1	A
NFS01	North Fork Saline River at Highway 5 near Benton		2	R
AFS01	Alum Fork Saline River at Highway 5 east of Crows		1	R
MFS01	Middle Fork Saline River at county road south of Crows		1	R
SFS01	South fork Saline River on county road north of Nance off US 70		2	R
OUA0018	Big Creek below Sheridan		1	A
OUA0010A	Saline Rive near Fountain Hill	Y	1	A
OUA0117	Saline River at Ozment Bluff	Y	1	A
OUA0118	Saline River at Highway 79 bridge	Y	1	A
OUA0167	Hudgens Creek at Highway 35 east of Rye		2	R
OUA0043	Big Creek at Highway 35 northwest of Sheridan		1	A
UWLGC01	L'Aigle Creek at Farmville Road, 2 miles southeast of Farmville		2	R
UWLGC02	L'Aigle Creek at county road, 2.5 miles west of Ingalls		2	R

Table A-14: Segment 2C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000582	ALCOA INC - BAUXITE	HURRICANE CK (008,028);HOLLY CK(009	08040203	006	1
AR0000876	BRADLEY LUMBER COMPANY	TRIB,SALINE RV (1,2) & BRUSHY FK(3)	08040204	002	2
AR0000914	POTLATCH FOREST PRODUCTS CORP.	FRANKLIN CK,SALINE RV,OUACHITA RV	08040204	002	3
AR0021695	RISON, CITY OF	TRIB,HARRISON CK,SALINE RV	08040204	006	4
AR0021822	MONTICELLO, CITY OF-WEST PLANT	10-MILE CK,SALINE RV,OUACHITA RV	08040204	002	5
AR0034002	BRYANT, CITY OF	TRIB,HURRICANE CK,SALINE RV,OUACHITA	08040203	006	6
AR0034291	HOT SPRINGS VILLAGE POA-MILL C	MILL CK,MIDDLE FK,ALUM FK,SALINE RV	08040203	019	7
AR0034347	SHERIDAN, CITY OF-WASTEWATER T	BIG CK,HURRICANE CK,SALINE RV	08040203	904	8
AR0035955	BRYANT PUB SCHOOL-SALEM ELEMEM	TRIB,HURRICANE CK,SALINE RV,OUACHIT	08040203	006	9
AR0036498	BENTON, CITY OF	TRIB,DEPOT CK,SALINE RV	08040203	010	10
AR0038989	HERMITAGE, CITY OF	BIG TOWN CK,L'AIGLE CK,SALINE RV	08040204	007	11
AR0039284	HOT SPRINGS VILLAGE-CEDAR CK	CEDAR CK,SOUTH FORK,SALINE RV	08040203	021	12
AR0040096	WILMAR, CITY OF	FLAT BRANCH CK,TEN MILE CK,OUACHITA	08040204	002	13
AR0041416	TIMBER RIDGE RANCH NEUROREHABI	DOG CK,TEN MILE CK,N FK/SALINE RV	08040203	011	14
AR0042277	PAWNEE VILLAGE POA	TRACE CK TRIB,SALINE RV	08040203	010	15
AR0042421	FOUNTAIN HILL, CITY OF	TRIB,FLAT CK,SALINE RV	08040204	002	16
AR0042889	JJ'S TRUCK STOP, INC	TRIB,BRUSHY CK,FRANCOIS CK,SALINE R	08040203	024	17
AR0043427	WARREN WATER & SEWER, CITY OF	SALINE RV	08040204	002	18
AR0043672	KINGSLAND, CITY OF	PANTHER CK,SALINE RV,OUACHITA RV	08040204	006	19
AR0044105	FLAKEBOARD AMERICA LIMITED	TRIB,BIG CK,SALINE RV,OUACHITA RV	08040203	024	20
AR0044156	ALCOA ROAD MOBILE HOME PARK	TRIB,HURRICANE CK,SALINE RV,OUACHIT	08040203	006	21
AR0044423	JESSIEVILLE PUBLIC SCHOOL	TRIB,COLEMAN CK,SALINE RV	08040203	019	22
AR0044547	HASKELL, CITY OF	TRACE CK,SALINE RV,OUACHITA RV	08040203	010	23
AR0045047	VILLAGE SQUARE SHOPPING CENTER	TRIB,MILL CK,SALINE RV	08040203	019	24
AR0046141	MTN VALLEY RETREAT CENTER	TRIB,S FK SALINE RV,SALINE RV	08040203	022	25
AR0046698	INTERNATIONAL PAPER CO-LEOLA L	SALINE RIVER TRIB	08040203	009	26
AR0046817	GLEN ROSE SCHOOL DIST	TRIB,10-MILE CK	08040203	024	27
AR0047431	PATHWAY CAMPGROUND, AR CHURCH	TRIB,BRUSHY CK,SALINE RV,OUACHITA R	08040203	024	28
AR0047732	J.P. PRICE LUMBER CO	TRIB,CLEAR CK,SALINE RV	08040204	002	29
AR0047830	JOHNSVILLE COMPANY, LLC	HUNT BR,SALINE RV,OUCHITA RV	08040204	002	30
AR0047902	H.G. TOLER & SON LUMBER CO, IN	TRIB,SALINE RV,OUACHITA RV	08040203	009	31
AR0048194	N GARLAND COUNTY BOYS & GIRLS	TRIB,COLEMAN CK,MID FK SALINE RV	08040203	019	32
AR0048445	POYEN, CITY OF-WWTP	TRIB,BIG CK,FRANCOIS CK,SALINE RV	08040203	025	33
AR0048569	WOODLAWN SCHOOL DISTRICT #6	TRIB,HUDGIN CK,SALINE RV	08040204	003	34
AR0049328	SALINE CO.PROP. IMPROV DIST#37	TRIB,SOUTH FORK SALINE R,SALINE R	08040203	020	35
AR0049506	BENTON PACKING COMPANY	TRIB,SALINE RV,OUACHITA RV	08040203	010	36
AR0049522	FREDS STORE/COMMERCIAL PARK	TRIB,HURRICANE CK,SALINE RV	08040203	006	37
AR0049751	M & H, INC-D/B/A SHERIDAN WHIT	TRIB,LOST CK,SALINE RV,OUACHITA RV	08040203	008	38
AR0049778	ARKANSAS DECORATIVE STONE, LLC	FLAT CK	08040203	008	39
AR0049786	BAUXITE, AR WWTF	TRIB,HURRICANE CK,SALINE R,OUACHITA	08040203	006	40
AR0050113	GENE GRAVES ENTERPRISES, LLC D	TRIB,HURRICANE CK,SALINE RV	08040203	006	41
AR0050202	DESTINED TO WIN/FAMILY OUTREAC	TRIB,N FRK SALINE RV,SALINE RV	08040203	011	42
AR0050270	ALMATIS, INC.	HURRICANE CK,SALINE RV,OUACHITA RV	08040203	006	43
AR0050300	BRADLEY LUMBER COMPANY-HERMITA	TRIB,L'AIGLE CK,SALINE RV,OUACHITA	08040204	007	44
AR0050326	CENTRAL ARKANSAS UTILITY SERVI	TRIB,SALINE RV,OUACHITA RV	08040203	010	45
AR0050563	CENTRAL ARK UTILITY-CROSSROADS	TRIB,CLIFT CK,SALINE RV	08040203	010	46
AR0050601	BANKS, CITY OF	TRIN,L'AIGLE CK,SALINE RV,OUACHITA	08040204	007	47

AR0050750	FOUNTAIN LAKE HEALTHCARE/REHAB	S. FORK OF SALINE RV, SALINE RV, OUACHITA RV	08040203	022	48

SEGMENT 2D LOWER OUACHITA RIVER AND TRIBUTARIES

Segment 2D occupies the south central part of Arkansas covering Calhoun, Bradley, Dallas, Ouachita, Cleveland, Columbia, Ashley, Nevada, and Union Counties. Segment 2D encompasses the lower Ouachita River and its tributaries from the confluence of the Little Missouri and Ouachita Rivers to the Louisiana state line. The major tributaries are Moro Creek, Lapile Creek, Champagnolle Creek, and Smackover Creek.

Summary of Water Quality Conditions

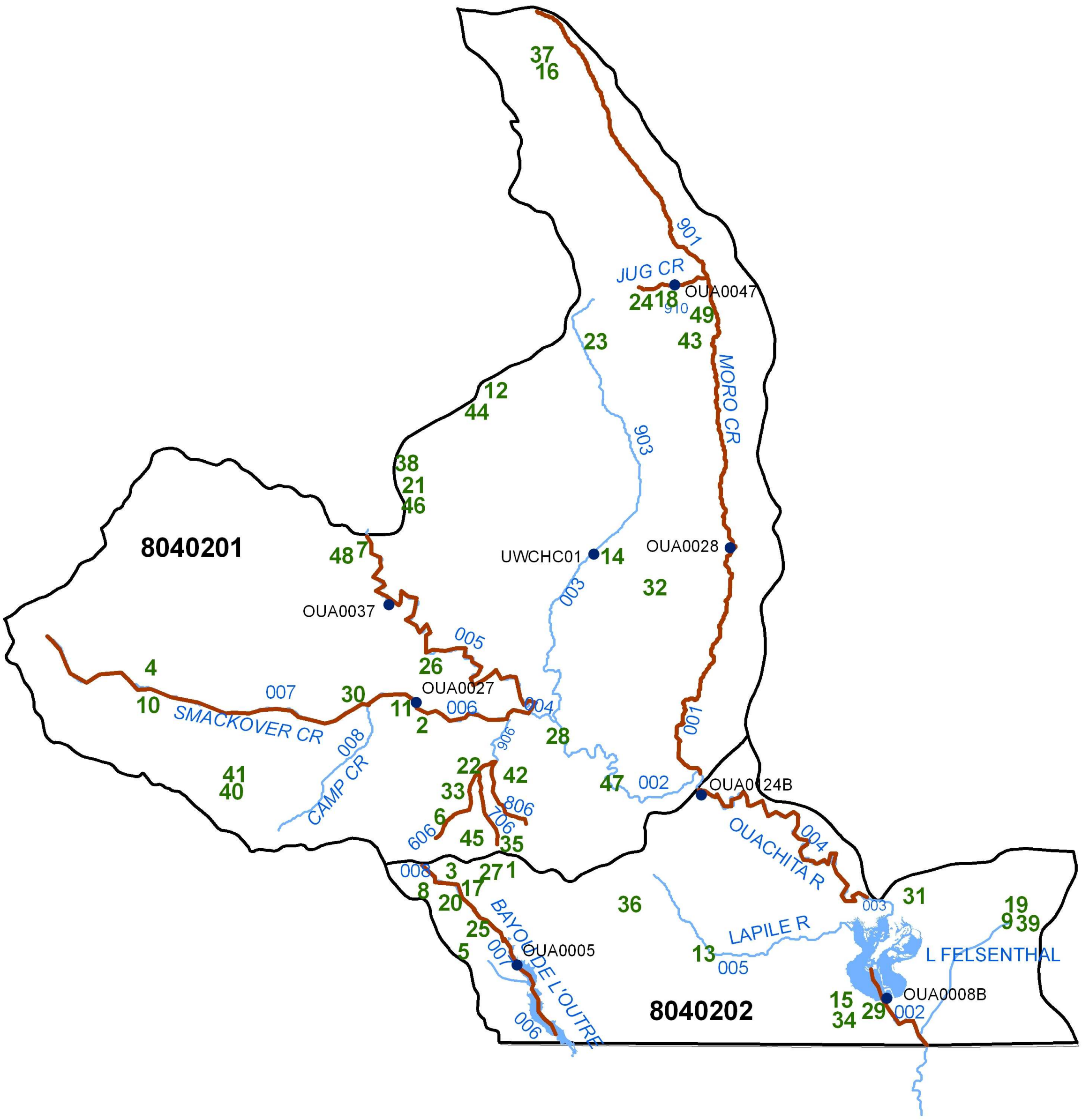
The waters within this segment have been designated as suitable for fish propagation, wildlife, primary and secondary contact recreation, as well as public, industrial, and agricultural water supplies. Monitored data were used as the basis of assessing 220.2 miles of stream. An additional 125.4 miles were evaluated bringing the total number of miles assessed within this segment to 345.6 stream miles.

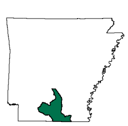
The Lower Ouachita River, Champagnolle, and Moro Creeks have fish consumption advisories due to mercury contamination. A consumption advisory has been placed on 66.3 miles of the Ouachita River, 20.0 miles of Champagnolle Creek, and 12 miles of Moro Creek. A TMDL was completed in 2002 for mercury in the lower Ouachita River Basin in Arkansas and Louisiana.

Bayou De L'Outre has been listed as not attaining the aquatic life use and the agriculture and industrial water supply uses because of elevated levels of total dissolved solids, sulfates, lead and zinc. A combination of nonpoint source pollution runoff, and discharges from industrial and municipal point sources are the suspected sources. Additional monitoring is needed to better assess the impairments and delineate the sources.

Some of the most severe water quality problems exist in the unnamed tributary from El Dorado Chemical Company (ELCC), in Flat Creek and Salt Creek. The ELCC tributary contains toxic ammonia levels, very high nitrates, high minerals (SO_4/ TDS), and metals (copper and zinc); the source is from the El Dorado Chemical Company discharge. Flat Creek and Salt Creek have very high minerals (CL/ SO_4/TDS) and metals (copper and zinc). The exact source is unknown, but these drainage basins are from the northern edge of El Dorado where numerous oil and brine processing and storage facilities exist along with numerous abandoned pumping facilities. These streams enter Smackover Creek below the ambient monitoring station. TMDLs were completed in October 2002 and in October 2003. Additional point source controls are also needed to address these issues.

Figure A-12: Planning Segment 2D





(Segment 2D)

Table A-15: Planning Segment 2D—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-2D																										
Ouachita River	8040202	-002	4.0	OUA0008B	M	N	N	S	S	S	S	UN	UN	UN		Zn	Cu	Hg		5d	5d	4a		FISH CONSUMPTION	226.4	119.2
Ouachita River	8040202	-003	8.4		M	N	S	S	S	S	S	UN				Hg				4a				AQUATIC LIFE	74.3	271.3
Ouachita River	8040202	-004	28.9	OUA0124B	M	N	N	S	S	S	S	UN	UN			Zn	Hg			5d	4a			PRIMARY CONTACT	345.6	0.0
Lapile Creek	8040202	-005	25.3		U															3				SECONDARY CONTACT	345.6	0.0
B. De L'Outre	8040202	-006	32.4	OUA0005	M	S	N	S	S	S	N	RE/IP/MP				Zn	TDS	SO4		5a	5a	5a	5a	DRINKING SUPPLY	313.1	32.5
B. De L'Outre	8040202	-007	6.9		E	S	N	S	S	S	N	RE/IP/MP				Zn	TDS	SO4		5a	5a	5a	5a	AGRI & INDUSTRY	295.7	49.9
B. De L'Outre	8040202	-008	10.6		E	S	N	S	S	S	N	RE/IP/MP				Zn	TDS	SO4		5a	5a	5a	5a			
Moro Creek[1]	8040201	-901	57.9		E	S	N	S	S	S	S	SE	UN	UN		SI	Pb	1		5a	5d	5d				
Moro Creek[2]	8040201	-001	12.0	OUA0028	M	N	N	S	S	S	S	SE	UN	UN	UN	SI	Pb	1	Hg	5a	5d	5d	4a			
Ouachita River	8040201	-002	22.5		M	N	S	S	S	S	S	UN				Hg				4a						
Ouachita River	8040201	-004	2.5		M	N	S	S	S	S	S	UN				Hg				4a						
Ouachita River	8040201	-005	34.2	OUA0037	M	S	N	S	S	S	S	UN	UN			Cu	Zn			5d	5d					
l. Champagnolle[3]	8040201	-903	20.9		E	N	S	S	S	S	S	UN				Hg				4a						
Champagnolle[4]	8040201	-003	20.0	UWCHC01	M	N	S	S	S	S	S	UN				Hg				a4						
Smackover Cr.	8040201	-006	14.8	OUA0027	M	S	N	S	S	S	S	UN	UN	SE		Zn	DO	SI		5a	5a	5a				
Smackover Cr.	8040201	-007	29.1		E	S	N	S	S	S	S	UN	UN	SE		Zn	DO	SI		5a	5a	5a				
Camp Creek	8040201	-008	13.3		U															3						
Elcc Trib.	8040201	-606	8.5	OUA0137A+	M	S	N	S	S	N	S	IP	IP	IP		NO3	Cu	Zn		5e	5e	5e	*			
Flat Cr.	8040201	-706	16.0	OUA0137C	M	S	N	S	S	N	S	IP	IP			Cu	Zn			5e	5e		*			
Salt Cr.	8040201	-806	8.0	OUA0137D	M	S	N	S	S	N	S	IP	IP			Cu	pH			5e	5e		*			
Haynes Cr.	8040201	-906	10.0		U															3						
Jug Creek[5]	8040201	-910	8.0	OUA0047	M	S	N	S	S	S	S	MP	MP			Pb	Cu			5e	5e					
TOTAL MILES	394.2																									
MILES UNASSESSED	48.6															1 = Cu & Zn				* = TMDLs for AM, CL, SO4, & TDS.						
MILES EVALUATED	125.4																									
MILES MONITORED	220.2																									

1 Reach formally -001U
2 Reach formally -001L
3 Reach formally -003U
4 Reach formally -003L
5 Reach formally -901

Table A-16: Segment 2D Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000574	COOPER STANDARD AUTOMOTIVE	DIT,BOGGY CK,BU DE LOUTRE	08040202	007	1
AR0000591	CROSS OIL REFINING & MARKETING	SMACKOVER CK (1-3) & HOLMES CK (4)	08040201	006	2
AR0000647	LION OIL COMPANY-EL DORADO REF	1-7: LOUTRE CK; 010: OUACHITA RV	08040202	007	3
AR0000663	BERRY PETROLEUM CO-STEPHENS	TRIB,SMACKOVER CK,OUACHITA RV	08040201	007	4
AR0000680	GREAT LAKES SOUTH	GUM CK-2D (1) & WALKER CK-2E (2,3)	08040202	007	5
AR0000752	EL DORADO CHEMICAL CO, INC	TRIB,FLAT CK,HAYNES CK,OUACHITA RV	08040202	606	6
AR0000841	ARKANSAS ELECTRIC COOP-MCCLELL	OUACHITA RV	08040201	005	7
AR0001171	GREAT LAKES CHEMICAL CORP-CENT	BU DE LOUTRE;LTL CORNIE BU;OUACHITA	08040202	007	8
AR0001210	GEORGIA PACIFIC-CROSSETT PAPER	MOSSY LK,COFFEE CR, OUACHITA RV	08040202	902	9
AR0020168	STEPHENS, CITY OF	SMACKOVER CK,OUACHITA RV	08040201	007	10
AR0021440	SMACKOVER, CITY OF	SMACKOVER CK,OUACHITA RV	08040201	006	11
AR0021474	BEARDEN, CITY OF	TWO BAYOU CK,OUACHITA RV	08040201	005	12
AR0021687	STRONG, CITY OF	LAPILE CK,OUACHITA RV	08040202	005	13
AR0021873	HAMPTON, CITY OF	CHAMPAGNOLLE CK	08040201	003	14
AR0022268	HUTTIG, CITY OF	OUACHITA RV	08040202	002	15
AR0033715	CARTHAGE, CITY OF	MORO CK TRIB,OUACHITA RV	08040201	001	16
AR0033723	EL DORADO, CITY OF-SOUTH WWTP	BU DE LOUTRE,OUACHITA RV	08040202	007	17
AR0033758	FORDYCE, CITY OF	JUG CK,MORO CK,OUACHITA RV	08040201	901	18
AR0033812	N CROSSETT UTILITIES	LTL BRUSHY CK, BIG BRUSHY CK	08040202	003	19
AR0033936	EL DORADO, CITY OF-NORTH WWTP	TRIB,FLAT CK,HAYNES CK,SMACKOVER	08040201	706	20
AR0034363	SHUMAKER PUBLIC SERVICE CORP	UNNAMED TRIB, TWO BAYOU CK,OUACHITA RV	08040201	005	21
AR0035653	NORPHLET, CITY OF	TRIB/ELCC TRIB/FLAT CK,HAYNES CK,SMACKOVER CK	08040201	606	22
AR0035661	THORNTON, CITY OF	TURNERS CK,CHAMPAGNOLLE CK,OUACHITA	08040201	003	23
AR0036064	GEORGIA PACIFIC WOOD PRODUCTS	DIT,JUG CK,MORO CK	08040201	901	24
AR0036072	GEORGIA PACIFIC WOOD PROD,LLC-	TRIB,BAYOU DE LOUTRE,OUACHITA RV	08040202	007	25
AR0037761	LIBERTY BAPT ASSN-DBA BEECH SP	TRIB,OUACHITA RV	08040201	005	26
AR0037800	CLEAN HARBORS EL DORADO, LLC	BOGGY CK	08040202	007	27
AR0038211	CALION, CITY OF	CHAPELLE SLU,OUACHITA RV	08040201	002	28
AR0039659	FELSENTHAL, TOWN OF	WOLF SLOUGH, OUACHITA RV	08040202	002	29
AR0040517	LOUANN, CITY OF	BRUSHY CK,SMACKOVER CK,OUACHITA RV	08040201	007	30
AR0042315	CROSSETT HARBOR PORT AUTHORITY	OUACHITA RV	08040202	003	31
AR0042609	HARRELL, CITY OF	SPRING BR,BLANN CK,LLOYD CK,MORO CK	08040201	001	32
AR0044733	CEDARWOOD LEISURE PARK, LLC	TRIB,FLAT CK,HAYNES CK,SMACKOVER CK	08040201	606	33
AR0046116	WEST FRASER (SOUTH), INC	DOLLAR SLU (1,2); BUCKHORN SLU (4)	08040202	003	34
AR0047368	COLUMBIAN CHEMICALS COMPANY	TRIB,BOGGY CK,BU DE LOUTRE,OUACHITA	08040201	007	35
AR0047384	ANTHONY FOREST PRODUCTS COMPAN	N LAPILE CK,LAPILE CK OUACHITA RV	08040202	005	36
AR0047503	IDAHO TIMBER CORP OF CARTHAGE,	TRIB,MORO CK,SALINE RV,OUCHITA RV	08040201	001	37
AR0048046	ROGERS LUMBER COMPANY, INC	TRIB,OLD LOWER RV,OUACHITA RV	08040102		38
AR0048097	GEORGIA PACIFIC, LLC-N LOG YRD	TRIB,LTL BRUSHY CK,BRUSHY CK	08040202	003	39
AR0048381	WATSON SAWMILL, INC.	TRIB,BEECH CK,SMACKOVER CK,OUACHITA	08040201	007	40
AR0049123	MT HOLLY SCHOOL WASTEWATER SYS	TRIB,DRY CK,BEECH CK,SMACKOVER CK	08040201	007	41
AR0049140	UNION POWER PARTNERS, LP-UNION	OUACHITA RV	08040201	806	42
AR0049204	GEORGIA PACIFIC-FORDYCE OSB FA	TRIB,MORO CK,OUACHITA RV	08040201	001	43
AR0049646	STANDARD GRAVEL COMPANY, INC	MILL CK,FREECO BU,OUACHITA RV	08040102	001	44

AR0049743	EL DORADO WATER UTILITIES	OUACHITA RV	08040201	706	45
AR0049891	ANTHONY TIMBERLANDS, INC.	TRIB. OUACHITA R.	08040102	001	46
AR0050296	EL DORADO WATER UTILITIES JOIN	OUACHITA RV	08040201	002	47
AR0050482	GARLAND GASTON LUMBER COMPANY,	TRIB,MILL CK,TWO BU,OUACHITA RV	08040201	005	48
AR0050661	TINSMAN, CITY OF	WATSON CK,MORO CK,OUACHITA RV	08040201	001	49

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SEGMENT 2E UPPER CORNIE BAYOU AND TRIBUTARIES

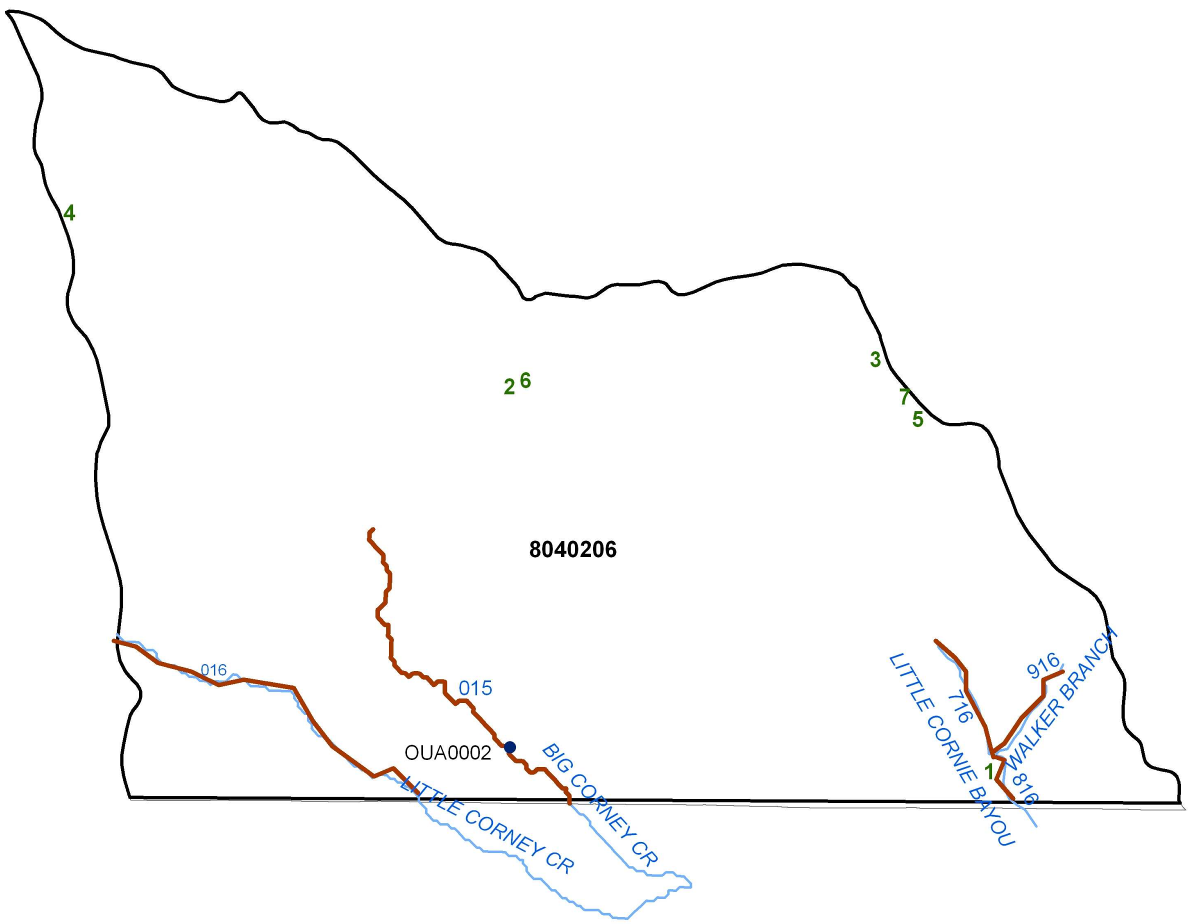
Segment 2E is located in south central Arkansas and covers parts of Columbia and Union Counties. This segment includes the upper portions of Cornie Bayou and Little Cornie Bayou, which eventually flow into the Ouachita River in northern Louisiana. The two major tributaries are Beech Creek and Three Creeks.

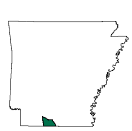
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. From a total of 44.0 miles of stream within this segment, 15.0 stream miles were assessed using monitored data and 29.0 stream miles were evaluated.

Sulfates and zinc continue to be the major causes of impairment to all of the waters within this basin. Siltation was added most recently as impairing the aquatic life use to the streams in this basin. Resource extraction is listed as the source of the silt. Additional assessment and reclamation activities are needed to address these issues.

Figure A-13: Planning Segment 2E





(Segment 2E)

Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-17: Planning Segment 2E—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-2E																										
Big Cornie Cr.	8040206	-015	15.0	OUA0002	M	S	N	S	S	S	N	RE	RE	RE	UN	Zn	SI	SO4	Be	5c	5c	5d	5d	FISH CONSUMPTION	44.0	0.0
Little Cornie Cr.	8040206	-016	18.0		E	S	N	S	S	S	N	RE	RE	RE		Zn	SI	SO4		5c	5c	5d		AQUATIC LIFE	0.0	44.0
Little Cornie Bayou	8040206	-716	5.0		E	S	N	S	S	S	N	RE	RE	RE		Zn	SI	SO4		5c	5c	5d		PRIMARY CONTACT	44.0	0.0
Little Cornie Bayou	8040206	-816	3.0		E	S	N	S	S	S	N	RE	RE	RE		Zn	SI	SO4		5c	5c	5d		SECONDARY CONTACT	44.0	0.0
Walker Branch	8040206	-916	3.0		E	S	N	S	S	S	N	RE	RE	RE		Zn	SI	SO4		5c	5c	5d		DRINKING SUPPLY	44.0	0.0
																								AGRI & INDUSTRY	0.0	44.0

TOTAL MILES	44.0
MILES UNASSESSED	0.0
MILES EVALUATED	29.0
MILES MONITORED	15.0

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
OUA0002	Cornie Bayou near Three Creeks	Y	1	A

Table A-18: Segment 2E Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0022179	JUNCTION CITY, CITY OF	LTL CORNIE BU,LOUISIANA STATE LINE	08040206	016	1
AR0043516	GREAT LAKES WEST	SEWELL CK,W THREE CKS,THREE CKS,...	08040206		2
AR0047813	OAK MANOR WATER & WASTEWATER	JAY DISON SPRING BR,CORNIE BU	08040206		3
AR0047945	GUNNELS MILL, INC	TRIB,LTL CORNIE BU,CORNIE CK	08040206		4
AR0048461	DEL-TIN FIBER L.L.C.	TRIB,CORNIE CK,OUACHITA RV	08040206		5
AR0049000	ALBEMARLE CORP-EAST PLANT	SEWELL CK,THREE CKS,OUACHITA RV	08040206		6
AR0049182	WILLIAM R. GAUNT PROPERTIES	TRIB,FLAT CK,HAYNES CK,SMACKOVER CK	08040206		7

SEGMENT 2F OUACHITA RIVER AND TRIBUTARIES: HEADWATERS TO MOUTH OF TWO BAYOU

Segment 2F, located in west central Arkansas, covers most of Hot Spring, Garland, and Montgomery Counties and portions of Clark, Dallas, Pike, Polk, Yell, Perry, Calhoun, and Ouachita Counties. This segment consists of a 220-mile reach of the upper Ouachita River and a 70-mile reach of the Caddo River. Principal tributaries include the South Fork of the Ouachita River, Mazarn Creek, L'Eau Frais Creek, and Irons Fork Creek. Segment 2F contains three major impoundments of the Ouachita River: Lake Ouachita, Lake Hamilton, and Lake Catherine. DeGray Reservoir, an impoundment of the Caddo River, is also located in Segment 2F.

Summary of Water Quality Conditions

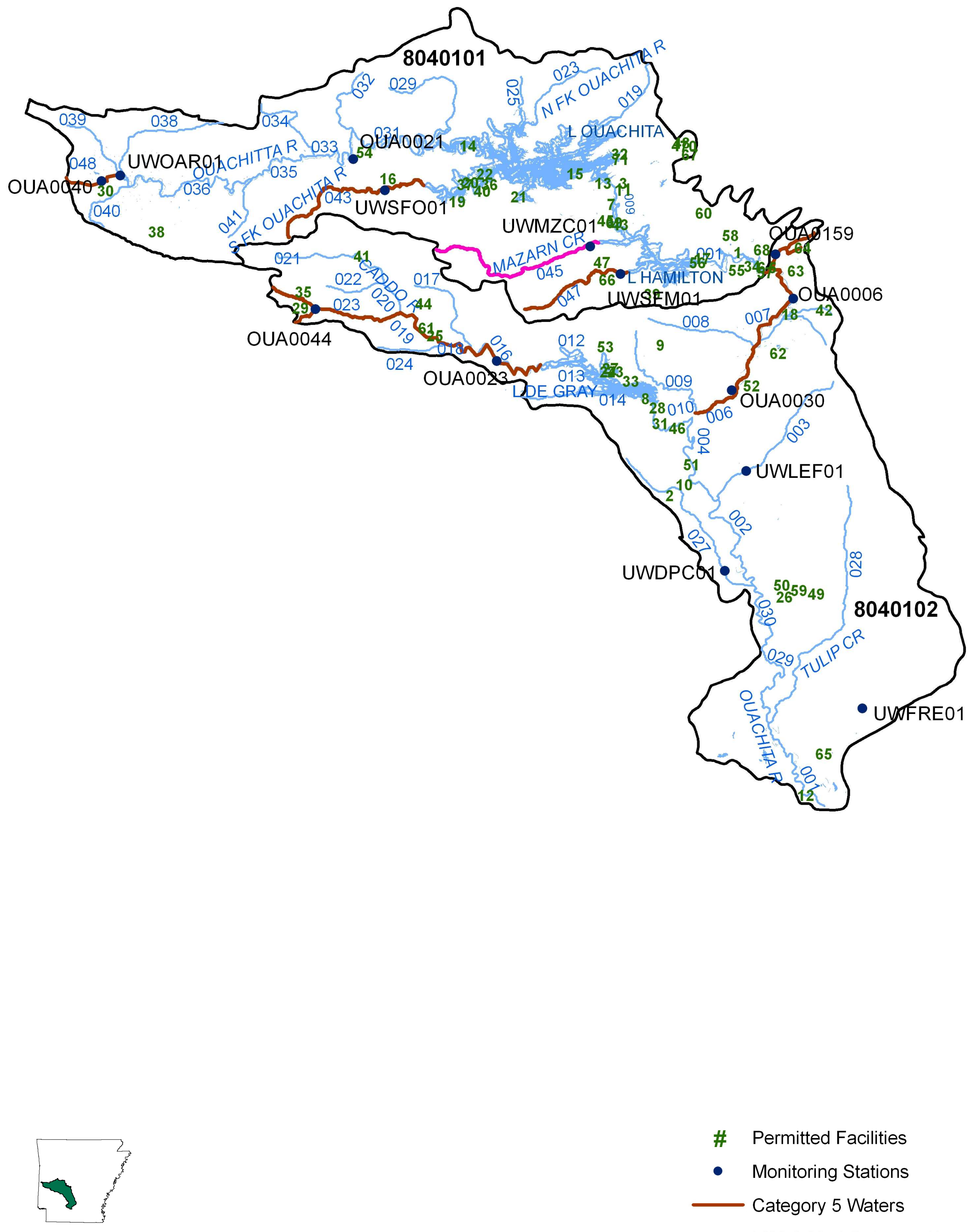
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. Monitored data were used as the basis of assessing 344 miles of stream within this segment. An additional 232 miles were evaluated bringing the total number of miles assessed with in this segment to 576 stream miles. Approximately 36 percent of the waters within this segment are designated as extraordinary resource waters. Water quality in Segment 2F is generally good and trends seem to indicate it is improving.

The South Fork of the Caddo and Caddo River downstream of the South Fork are not attaining the aquatic life use because of excessive metals (beryllium, copper, zinc) concentrations. The source is thought to be from abandoned open pit mining.

Chamberlain Creek and its tributaries receiving drainage from the MagCoBar pit mine and were listed as not attaining the aquatic life use, domestic water supply use, and the industrial and agriculture water supply uses. Low pH values, elevated minerals (total dissolved solids, sulfates, chlorides), and elevated metals (beryllium, cadmium, copper, zinc), are all causes of the impairments. Additional point source and nonpoint source controls are needed to address the problem.

Prairie Creek below the City of Mena was assessed as not attaining the aquatic life use because of elevated copper levels and turbidity from surface erosion.

Figure A-14: Planning Segment 2F



(Segment 2F)

Figure A-15: Planning Segment 2F

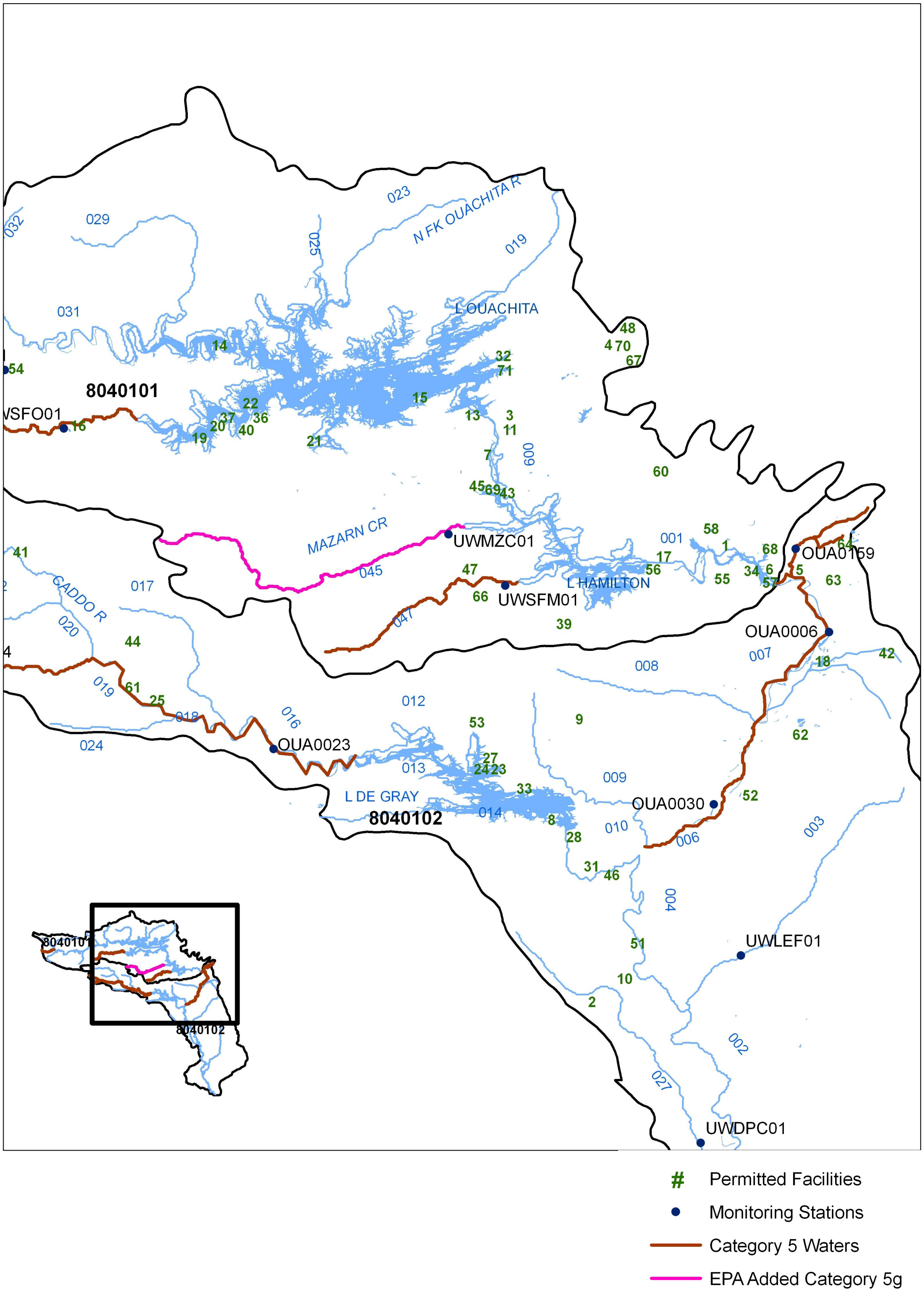


Table A-19: Planning Segment 2F—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4
SEG-2F																							
Ouachita River	8040102	-001	15.6	OUA0165	M	S	S	S	S	S	S									1			
Ouachita River	8040102	-002	16.9		E	S	S	S	S	S	S									1			
L'Eau Frais C.	8040102	-003	21.5	UWLEF01	M	S	S	S	S	S	S									1			
Ouachita River	8040102	-004	15.8		E	S	S	S	S	S	S									1			
Ouachita River	8040102	-005	0.6		E	S	S	S	S	S	S									1			
Ouachita River	8040102	-006	12.1	OUA0030	M	S	N	S	S	S	S	UN				Zn				5d			
Ouachita River	8040102	-007	14.5	OUA0006A+	M	S	S	S	S	N	S	UN	UN			Be	Zn			5d	5d		
Prairie Bayou	8040102	-008	13.5		E	S	N	S	S	S	S	SE	UN			SI	Cu			5d	5d		
DeRoche Cr.	8040102	-009	16.5		U															3			
Caddo River	8040102	-010	8.1		E	S	S	S	S	S	S									1			
Caddo River	8040102	-016	13.5	OUA0023	M	S	N	S	S	N	S	RE	RE			Zn	Be			5c	5d		
Caney Creek	8040102	-017	12.5		U															1			
Caddo River	8040102	-018	4.1		E	S	N	S	S	S	S	RE				Zn				5c			
Caddo River	8040102	-019	7.7		E	S	N	S	S	S	S	RE				Zn				5c			
Caddo River	8040102	-020	4.1		U															3			
Caddo River	8040102	-021	15.9		U															3			
Mill Creek	8040102	-022	7.3		E	S	S	S	S	S	S									1			
S. Fork Caddo	8040102	-023	16.6	OUA0044	M	S	N	S	S	S	S	RE	RE			Cu	Zn			5a	5a		
D.C. Creek	8040102	-923	5.0	OUA0044T	M	S	S	S	S	N	S	RE	RE			Be	Zn			5c	5c		
Rock Creek	8040102	-024	8.1		E	S	S	S	S	S	S									1			
Brushy Creek	8040102	-026	6.9		E	S	S	S	S	S	S									1			
Deceiper Cr.	8040102	-027	24.4	UWDPC01	M	S	S	S	S	S	S									1			
Bayou Freeo	8040102	-028	33.9	UWFRE01	M	S	S	S	S	S	S									1			
Ouachita River	8040102	-029	13.3		E	S	S	S	S	S	S									1			
Tulip Creek	8040102	-901	20.0	OUA0169+	M	S	S	S	S	S	S									1			
Cypress Creek	8040102	-801	30.0	OUA0170	M	S	S	S	S	S	S									1			
Ouachita River	8040102	-030	12.0		E	S	S	S	S	S	S									1			
Cove Creek[1]	8040102	-976	3.6	OUA0171A	M	S	S	S	S	S	S									1			
Lucinda Creek[2]	8040102	-975	2.2	OUA0171B	M	S	N	S	S	N	N	RE	RE	RE	RE	pH	SO4	Zn	Be	5a	5a	5a	5a
Cove Creek[3]	8040102	-974	0.7		E	S	S	S	S	S	S									1			
Basin Creek[4]	8040102	-973	1.4	OUA0171D	M	S	S	S	S	S	S									1			
Cove Creek[5]	8040102	-972	1.1		E	S	S	S	S	S	S									1			
Chamberlain Creek[6]	8040102	-971	2.5	OUA0104	M	S	N	S	S	N	N	RE	RE	RE		pH	1	2		5a	5a	5a	
Cove Creek[7]	8040102	-970	7.8	OUA0159	M	S	N	S	S	N	N	RE	RE	RE	RE	SO4	TDS	Zn	Be	5a	5a	5a	5a
Ouachita River	8040101	-001	10.4		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-009	2.7		E	S	S	S	S	S	S									1			
Blakely Creek	8040101	-019	8.3		E	S	S	S	S	S	S									1			
N. Fork Ouachita	8040101	-023	10.9		E	S	S	S	S	S	S									1			
Irons Fork	8040101	-025	4.8		E	S	S	S	S	S	S									1			
Muddy Creek	8040101	-029	15.3		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-031	14.4		E	S	S	S	S	S	S									1			
Fiddlers Cr.	8040101	-032	10.6		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-033	11.9	OUA0021	M	S	S	S	S	S	S									1			
Ouachita River	8040101	-035	10.2		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-036	24.1	UWOAR01	M	S	S	S	S	S	S									1			
Bushy Creek	8040101	-034	12.1		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-037	0.7		E	S	S	S	S	S	S									1			
Ouachita River	8040101	-039	11.0	UWOAR01	M	S	S	S	S	S	S									1			
Iron Fork	8040101	-038	17.3		E	S	S	S	S	S	S									1			
Carters Creek	8040101	-040	9.0		U															3			
Kates Creek	8040101	-041	8.2		U															3			
S.Fork Ouachita	8040101	-043	22.5	UWSFO01	M	S	S	N	S	S	S	UN				PA				5d			
Mazarn Creek	8040101	-045	23.3	UWMZC01	M	S	N	S	S	S	S	UN				pH				5g			
Little Mazarn	8040101	-047	14.8	UWSFM01	M	S	N	S	S	S	S	UN				pH				5f			
Prairie Creek	8040101	-048	10.0	OUA0040	M	S	N	S	S	S	S	UN	UN	UN		DO	SI	Cu		5d	5d	5d	
TOTAL MILES	642.2																						
MILES UNASSESSED	66.2																						
MILES EVALUATED	233.8																						
MILES MONITORED	342.2																						

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	576.0	0.0
AQUATIC LIFE	447.9	128.1
PRIMARY CONTACT	553.5	22.5
SECONDARY CONTACT	576.0	0.0
DRINKING SUPPLY	530.5	45.5
AGRI & INDUSTRY	563.5	12.5

1 = Cl, SO4, & TDS
2 = Cd, Cu, Zn, Be

1 Reach formally -902A
2 Reach formally -500
3 New Reach Designation
4 Reach formally -505
5 New Reach Designation
6 Reach formally -501
7 Reach formally -902B

Table A-19 (cont.): Planning Segment 2F—Designated Use Attainment Status and Water Quality Monitoring

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
UWLEF01	L'Eua Frais Creek at Highway 128 near Joan		2	R
OUA0165	Ouachita River off Highway 270 above Stone Quarry Creek		2	R
OUA0030	Ouachita River near Donaldson		1	A
OUA0006A	Ouachita River near Malvern		1	A
OUA0006	Ouachita River at Rock Port	Y	1	A
OUA0023	Caddo River near Amity	Y	1	A
OUA0044	South Fork of Caddo River at Fancy Hill		1	A
OUA0044T	N.L. Baroid tributary to South Fork Caddo River		1	A
UWDPC01	Deceiper Creek at county road, 8 miles southeast of Gurdon		2	R
UWFRE01	Freeo Creek at Highway 9, 5 miles west of Bearden		2	R
OUA0168	White Oak Creek at Highway 128 northwest of Holly Springs		2	R
OUA0169	Tulip Creek at Highway 128 northwest of Holly Springs		2	R
OUA0170	Cypress Creek at Highway 7 north of Sparkman		2	R
OUA0100	Cove Creek above Highway 51		2	S
OUA0171D	Basin Creek on county road above confluence of Cove Creek		2	S
OUA0171C	Cove Creek on Baroid Road above confluence of Chamberlain Creek		2	S
OUA0171B	Lucinda Creek on Baroid Road above confluence of Chamberlain Creek		2	S
OUA0171A	Chamberlain Creek at Baroid Road near Magnet Cove		2	S
OUA0104	Chamberlain Creek above confluence of Cove Creek		2	S
OUA0159	Cove Creek at Highway 51 near Magnet Cove		1	A
OUA0021	Ouachita River near Pencil Bluff	Y	1	A
UWOAR01	Ouachita River at county road off Highway 88 near Boardcamp		1	R
UWSFO01	South Fork Ouachita River at Highway 270 at Mount Ida		1	R
UWMZC01	Mazarn Creek at Highway 227 near Sunshine		1	R
UWSFM01	Little Mazarn Creek at county road, 1.5 miles north of Pettyview		1	R
OUA0040	Prairie Creek below Mena		1	A

Table A-20: Segment 2F Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000523	STRATCOR, INC.	TRIB,LK CATHERINE,OUACHITA RV	08040101	001	1
AR0000531	REYNOLDS METALS CO-GUM SPRINGS	OUACHITA RV	08040102	027	2
AR0000833	WEYERHAEUSER CO-MOUNTAIN PINE	GLAZYPEAU CK,OUACHITA RV	08040101		3
AR0000850	MOUNTAIN VALLEY SPRING COMPANY	TRIB,GLAZYPEAU CK,LK HAMILTON	08040101	009	4
AR0000868	HOT SPRING CO-JONES MILL WWTF	COVE CK,OUACHITA RV	08040102	901B	5
AR0001147	ENTERGY ARKANSAS-LK CATHERINE	LK CATHERINE,OUACHITA RV	08040101	001	6
AR0020109	USDAFS-OUACHITA CIVILIAN CONSE	OUACHITA RV	08040101	009	7
AR0020222	USA-COE IRON MOUNTAIN RECREATI	DEGRAY LK	08040102		8
AR0020231	USA-COE SHOUSE FORD RECREATION	DEGRAY LK	08040102		9
AR0020605	ARKADELPHIA, CITY OF	OUACHITA RV	08040102	004	10
AR0021539	MOUNTAIN PINE, CITY OF	GLAZYPEAU CK,OUACHITA RV	08040101	009	11
AR0022365	CAMDEN, CITY OF	OUACHITA RV	08040102		12
AR0022781	USA-COE SPILLWAY REC AREA-OUAC	LK OUACHITA,0UACHITA RV	08040101	009	13
AR0022799	USA-COE LITTLE FIR RECREATION	LK OUACHITA	08040101	009	14
AR0022802	USA-COE BRADY MTN REC AREA	LK OUACHITA	08040101	009	15
AR0033855	MOUNT IDA, CITY OF	S FRK OUACHITA RV,OUACHITA RV	08040101	043	16
AR0033880	HOT SPRINGS, CITY OF-REGIONAL	LK CATHERINE	08040101	001	17
AR0034126	MALVERN, CITY OF	QUACHITA RV	08040102	007	18
AR0035394	USA-COE DENBY POINT RECREATION	LK OUACHITA	08040101	043	19
AR0035408	USA-COE TOMPKINS BEND REC AREA	LK OUACHITA	08040101	043	20
AR0035416	USA-COE CRYSTAL SPRINGS REC AR	LK OUACHITA	08040101	009	21
AR0035424	USA-COE JOPLIN RECREATION AREA	LK OUACHITA	08040101	04	22
AR0035432	USA-COE CADDO DRIVE RECREATION	DEGRAY LK	08040102		23
AR0035459	USA-COE ALPINE RIDGE RECREATIO	DEGRAY LK	08040102		24
AR0035645	GLENWOOD, CITY OF	CADDO RV	08040102	019	25
AR0035939	SPARKMAN, CITY OF	CYPRESS CK TRIB,OUACHITA RV	08040102	801	26
AR0036013	USA-COE ARLIE MOORE RECREATION	DEGRAY LK,CADDO RV,OUACHITA RV	08040102		27
AR0036021	USA-COE SPILLWAY/DAM RECREATIO	TRIB,CADDO RV,OUACHITA RV	08040102		28
AR0036609	TREMONT CORPORATION; D/B/A DEM	BACK VALLEY CK TRIB,S FRK CADDO RV	08040102	023	29
AR0036692	MENA, CITY OF	TRIB,PRAIRIE CK,QUACHITA RV	08040101	048	30
AR0036749	ARKADELPHIA HUMAN DEV CTR	CADDO RV TRIB	08040102		31
AR0036811	ARK PARKS LAKE OUACHITA	LK OUACHITA,OUACHITA RV	08040101	009	32
AR0037061	AR PARKS & TOURISM-DEGRAY LAKE	DEGRAY LK	08040102		33
AR0038121	ARK PARKS LAKE CATHERINE	LK CATHERINE,OUACHITA RV	08040101	001	34
AR0038270	BAKER-HUGHES INTEQ	S FK CADDO RV,CADDO RV,OUACHITA RV	08040102	023	35
AR0039403	HEPOA, LLC; FRMLY HARBOR EAST	DIT,LK OUACHITA	08040101	043	36
AR0040801	SHANGRI-LA RESORT, INC	LK OUACHITA	08040101	043	37
AR0041050	CHURCH OF NAZARENE-HEATH VALLE	MACKS CK	08040101	036	38
AR0041319	MILL POND VILLAGE	SORRELLS CK,...,LK HAMILTON	08040101	006	39
AR0042293	HEPOA, LLC; FRMLY HARBOR SOUTH	LK OUACHITA TRIB	08040101	043	40
AR0043125	NORMAN, CITY OF	CADDO RV,DEGRAY LK,OUACHITA RV	08040101	020	41
AR0043354	ACME BRICK COMPANY-PERLA FACIL	TRIB,TOWN CK,OUACHITA RV	08040102	007	42
AR0044172	WESTWOOD VILLAGE POA	LK HAMILTON	08040101	006	43
AR0044814	GS ROOFING PRODUCTS COMPANY	TRIB,5-MI CK,CADDO RV,LK DEGRAY	08040102	019	44
AR0045128	MCCLARD SHOPPING CENTER	TRIB,CEARLEY CK,LK HAMILTON	08040102	006	45

AR0045411	CADDO VALLEY, CITY OF	CADDO RV,OUACHITA RV	08040102		46
AR0045624	LAKE HAMILTON SCHOOL DISTRICT	TRIB,LOST CK,MAZAM CK,LK HAMILTON	08040101	006	47
AR0045829	O'BRIEN PROPERTIES, INC.	TRIB,GLAZYPEAU CK,OUACHITA RV	08040101	009	48
AR0046612	BRAZEALE LUMBER CO	TRIB,BRUSHY CK,OUACHITA RV	08040102	026	49
AR0047139	RAY WHITE LUMBER CO	TRIB,CYPRUS CK,OUACHITA RV	08040102	801	50
AR0047856	SHIELDS WOOD PRODUCTS, INC	TRIB,OUACHITA RV	08040102	004	51
AR0048020	DONALDSON, CITY OF	OUACHITA RV	08040102		52
AR0048241	LAKE CENTER GROCERY	BIG HILL CK,LK DEGRAY,CADDO RV	08040102		53
AR0048275	CAMP OZARK	TRIB,OUACHITA RV	08040101	031	54
AR0048615	DIAMONDHEAD RESORT; FRMLY RIVI	UNAMED DRAINAGE WAY, LK CATHERINE	08040101	001	55
AR0048755	ENTERGY-CARPENTER DAM	OUACHITA RV	08040101		56
AR0048763	ENTERGY AR, INC.-REMMEL DAM	OUACHITA RV	08040101		57
AR0048950	UMETCO MINERALS CORP-WILSON MI	WILSON CK,LK CATHERINE,OUACHITA RV	08040101	001	58
AR0049026	GARLAND GASTON LUMBER CO., INC	BRUSHY CK,OUACHITA RV	08040102	026	59
AR0049115	MAGIC SPRINGS DEVELOPMENT CO.	TRIB,GULPHA CK,LK CATHERINE	08040101	001	60
AR0049263	BEAN LUMBER COMPANY	CADDO RV TRIB	08040102	019	61
AR0049417	KGEN HOT SPRING,LLC	OUACHITA RV	08040102	007	62
AR0049611	HOT SPRING POWER CO.,LLC	OUACHITA RV	08040102	007	63
AR0049794	HALLIBURTON ENERGY SERVICES	CHAMBERLAIN CK,COVE CK,OUACHITA RV	08040102	501	64
AR0050105	HARMONY GROVE PUBLIC SCHOOL	MIZZELL CK,PALMER BU,OUCHITA RV	08040102	054	65
AR0050148	HOT SPRINGS, CITY OF-SOUTHWEST	LTL MAZARN CK,LK HAMILTON	08040101	047	66
AR0050458	OYSTER BAY RESTAURANT	TRIB,GLAZYPEAU CK,OUACHITA RV	08040101		67
AR0050512	REYNOLDS METALS/ROLLING PLANT	STONEY CK,LK CATHERINE,OUACHITA RV	08040102		68
AR0050644	LAKESIDE GARDENS CONDOMINIUMS	LK HAMILTON,OUACHITA RV	08040101		69
AR0050733	WAL-MART SUPERCENTER #5433-00	TRIB,GLAZYPEAU CK,LK HAMILTON,...	08040101		70
AR0050806	CAMP YORKTOWN BAY	LK OUACHITA			71

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SEGMENT 2G LITTLE MISSOURI RIVER AND ANTOINE RIVER

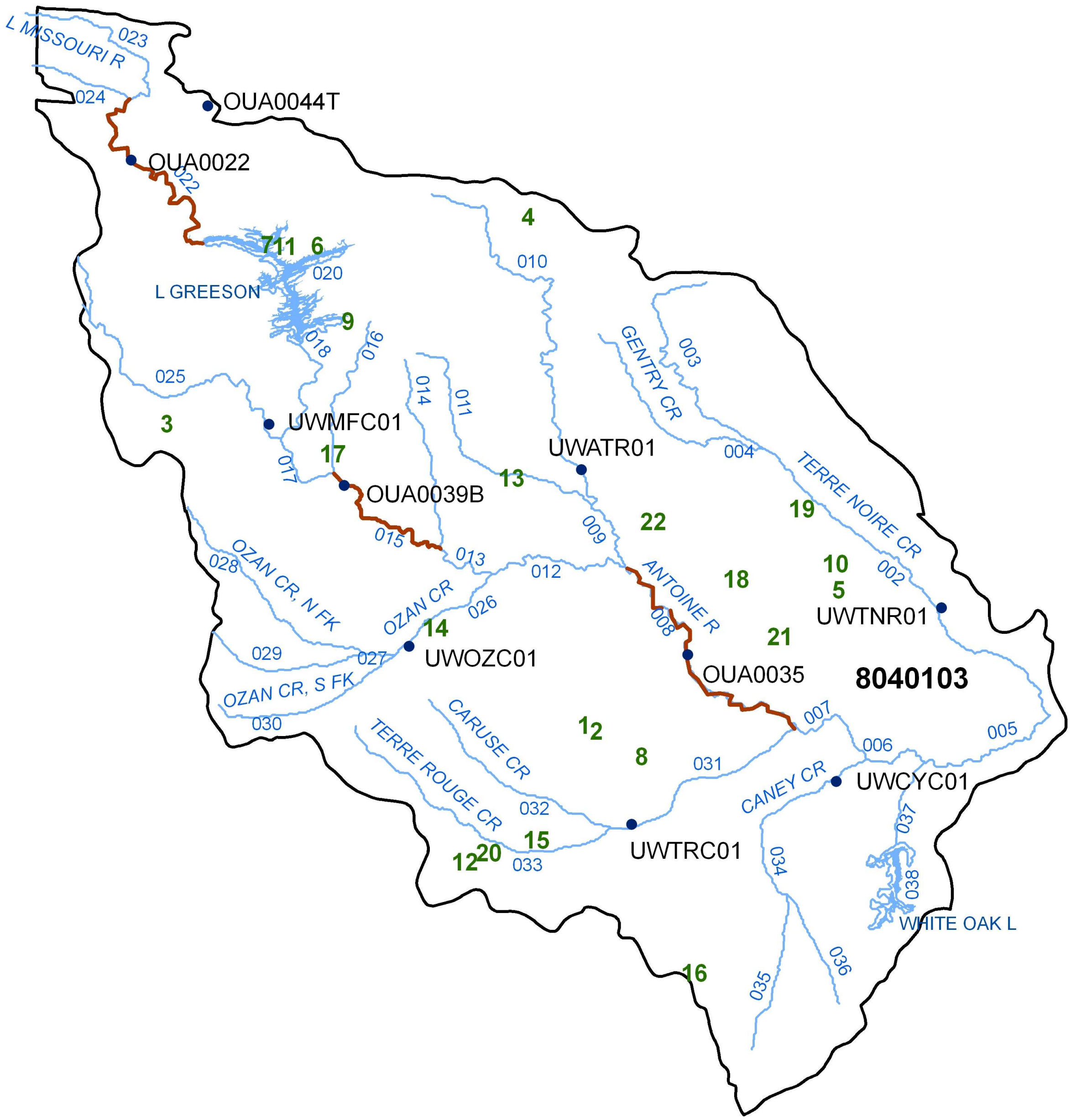
Segment 2G, located in the southwestern part of the State, covers most of Nevada and Pike Counties, large areas of Clark and Hempstead Counties, and small portions of Ouachita, Howard, Polk, and Montgomery Counties. This segment encompasses the entire drainage area of the Little Missouri River with its tributaries. Major tributaries include the Antoine River, Muddy Fork, Caney Creek, Terre Noire Creek, and Terre Rouge Creek. There are two large impoundments in the segment, Lake Greeson and White Oak Lake.

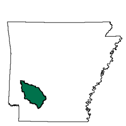
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. Monitored data were used as the basis of assessing 208.1 miles of stream within this segment. An additional 219.4 miles were evaluated bring the total number of miles assessed with in this segment to 427.5 stream miles. Approximately 17 percent of the waters within this segment are designated as extraordinary resource waters. This segment contains a total of 427.5 stream miles.

Portions of the Little Missouri River have been listed as not attaining the aquatic life use because of excessive copper and zinc contamination. Additional investigation into this problem is needed.

Figure A-16: Planning Segment 2G





(Segment 2G)

Table A-21: Planning Segment 2G—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-2G																										
L. Missouri R.	8040103	-001	1.8		E	S	S	S	S	S	S									1				FISH CONSUMPTION	427.5	0
L. Missouri R.	8040103	-005	10.4		E	S	S	S	S	S	S									1				AQUATIC LIFE	379.8	47.7
L. Missouri R.	8040103	-006	4.6		E	S	S	S	S	S	S									1				PRIMARY CONTACT	427.5	0
L. Missouri R.	8040103	-007	7.0		E	S	S	S	S	S	S									1				SECONDARY CONTACT	427.5	0
L. Missouri R.	8040103	-008	19.6	OUA0035	M	S	N	S	S	S	S	UN	UN			Cu	Zn			5d	5d			DRINKING SUPPLY	427.5	0
Terre Noire Cr.	8040103	-002	27.4	UWTNR01	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	427.5	0
Terre Noire Cr.	8040103	-003	19.6	UWTNR02	M	S	S	S	S	S	S									1						
Gentry Creek	8040103	-004	15.4		E	S	S	S	S	S	S									1						
Antoine River	8040103	-009	5.4		E	S	S	S	S	S	S									1						
Antoine River	8040103	-010	31.6	UWATR01	M	S	S	S	S	S	S									1						
Wolf Creek	8040103	-011	18.0		E	S	S	S	S	S	S									1						
L. Missouri R.	8040103	-012	10.8		E	S	S	S	S	S	S									1						
L. Missouri R.	8040103	-013	5.0		E	S	S	S	S	S	S									1						
L. Missouri R.	8040103	-015	10.5	OUA0039B	M	S	N	S	S	S	S	UN	UN			Zn	Pb			5d	5d					
L. Missouri R.	8040103	-017	5.5		E	S	S	S	S	S	S									1						
L. Missouri R.	8040103	-018	8.9		E	S	S	S	S	S	S									1						
L. Missouri R.	8040103	-022	17.6	OUA0022	M	S	N	S	S	S	S	UN				Zn				5d						
L. Missouri R.	8040103	-023	13.6		E	S	S	S	S	S	S									1						
Saline Creek	8040103	-014	13.1		E	S	S	S	S	S	S									1						
Prairie Creek	8040103	-016	11.2		E	S	S	S	S	S	S									1						
Long Creek	8040103	-024	6.8		E	S	S	S	S	S	S									1						
Muddy Fork	8040103	-025	24.4	UWMFC01	M	S	S	S	S	S	S									1						
Ozan Creek	8040103	-026	8.6	UWOZC01	M	S	S	S	S	S	S									1						
Ozan Creek	8040103	-027	2.0		E	S	S	S	S	S	S									1						
N. Fork Ozan	8040103	-028	16.4		E	S	S	S	S	S	S									1						
M. Fork Ozan	8040103	-029	10.9		E	S	S	S	S	S	S									1						
S. Fork Ozan	8040103	-030	13.0		E	S	S	S	S	S	S									1						
Terre Rouge	8040103	-031	14.5	UWTRC01	M	S	S	S	S	S	S									1						
Caruse Creek	8040103	-032	15.2		E	S	S	S	S	S	S									1						
Terre Rouge	8040103	-033	20.7		M	S	S	S	S	S	S									1						
Caney Creek	8040103	-034	13.6	UWCYC01	M	S	S	S	S	S	S									1						
Caney Creek	8040103	-035	10.6		E	S	S	S	S	S	S									1						
Cypress Creek	8040103	-036	7.9		E	S	S	S	S	S	S									1						
White Oak Creek	8040103	-037	5.9		E	S	S	S	S	S	S									1						
TOTAL MILES	427.5																									
MILES UNASSESSED	0																									
MILES EVALUATED	219.4																									
MILES MONITORED	208.1																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
OUA0035	Little Missouri River near Boughton	Y	1	A
UWTNR01	Terre Noir Creek at Highway 51, 2.5 miles east of Red Springs		2	R
UWTNR02	Terre Noir Creek at Highway 53, 2 miles south of Hollywood		2	R
UWATR01	Antoine River at Highway 26 near Antoine		2	R
OUA0039B	Little Missouri River below Murfreesboro	Y	1	A
OUA0022	Little Missouri River near Langley	Y	1	A
UWMFC01	Muddy Fork at county road off Highway 27 near Murfreesboro		2	R
UWOCZ01	Ozan Creek at Highway 24 near Blevins		2	R
UWTRC01	Terre Rouge Creek at Highway 19, 5 miles south of Prescott		2	R
UWCYC01	Caney Creek at Highway 24 near Bluff City		2	R

Table A-22: Segment 2G Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000612	FIRESTONE BLDG PRODUCTS	GARLAND CK TRIB & PINE CK TRIB	08040103		1
AR0000906	POTLATCH FOREST PRODUCTS CORP.	MILL BR,ONION CK,TERRE ROUGE CK	08040103		2
AR0020729	BPB GYPSUM, INC	BLUFF CK,MUDDY FORK CK-LTL MO RV	08040103	025	3
AR0021521	AMITY, CITY OF	LTL ANTOINE CK-RV,LTL MISSOURI RV	08040103	010	4
AR0022551	GURDON, CITY OF	CANEY CK,TERRE NOIR CK,LTL MO RV	08040103	010	5
AR0022764	USA-COE KIRBY LANDING REC AREA	LK GREESON	08040103	020	6
AR0022772	USA-COE SELF CREEK REC AREA	LK GREESON,LITTLE MISSOURI,OUACHITA	08040103	021	7
AR0033481	PRESCOTT, CITY OF	SEWER CK,TERRE ROUGE CK, LTL MO RV	08040103		8
AR0036048	USA-COE COWHIDE COVE RECREATIO	LK GREESON,LTL MISSOURI RV,OUACHITA	08040103	018	9
AR0037796	INTERNATIONAL PAPER CO-GURDON	DIT-HWY 67N,CANEY CK,TERRE NOIRE CK	08040103	010	10
AR0038113	AR PARKS & TOURISM-DAISY STATE	LK GREESON,LITL MO RV,OUACHITA RV	08040103	021	11
AR0038458	HOPE, CITY OF-PATE CREEK WWTP	PATE CK,TERRE ROUGE CK,LTL MO RV	08040103	033	12
AR0041432	DELIGHT, CITY OF	TRIB,WOLF CK,ANTOINE RV,LTL MO RV	08040103	011	13
AR0041688	BLEVINS, CITY OF	TRIB,OZAN CK,LTL MISSOURI RV	08040103	026	14
AR0041815	EMMET, CITY OF	TERRE ROUGE CK,LTL MO RV,OUACHITA RV	08040103	033	15
AR0042439	NEVADA SCHOOL DISTRICT #1	TRIB,LTL CANEY CK, CANEY CK,LTL MO RV	08040103	034	16
AR0043281	MURFREESBORO, CITY OF	LTL MISSOURI RV,OUACHITA RV	08040103	016	17
AR0044270	AR HWY DEPT-GURDON REST AREA	BOGGY CK TRIB,LTL MISSOURI RV	08040103	008	18
AR0045551	INTERSTATE PROPERTY OWNERS	S BOAT DIT,TERRE NOIR CK	08040103	010	19
AR0047180	PERRYTOWN, CITY OF	PATE CK,TERRE ROUGE CK,LTL MO RV	08040103	033	20
AR0047546	ANTHONY TIMBERLANDS INC-BEIRNE	TRIB,MCNEELEY CK,LTL MISSOURI RV	08040103	007	21
AR0048551	OKOLONA, CITY OF-WASTEWATER TR	TRIB,LTL MISSOURI RV,OUACHITA RV	08040103	008	22

SEGMENT 3A LOWER ARKANSAS RIVER

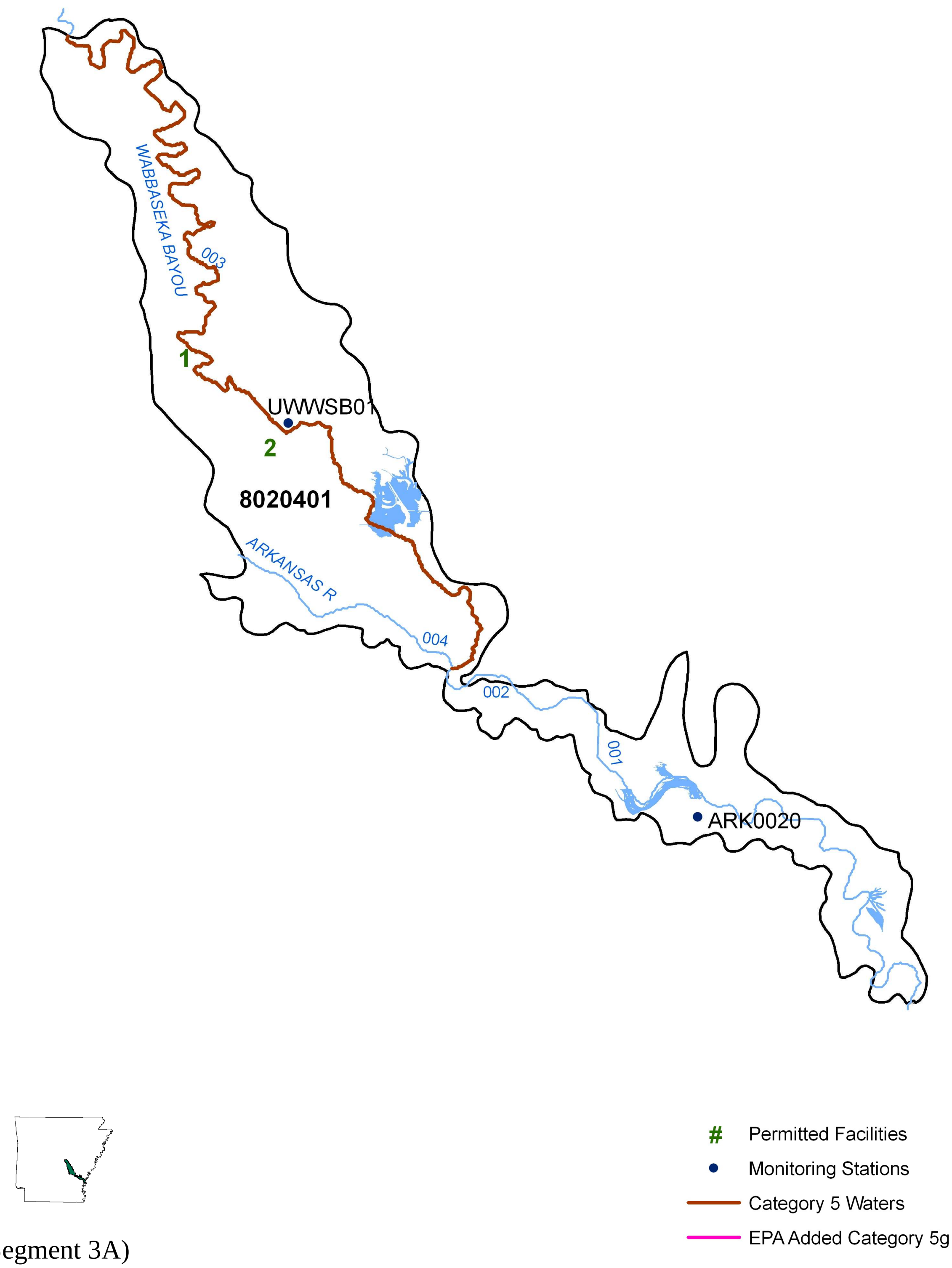
Segment 3A, located in the southeastern part of Arkansas includes small portions of Desha, Lincoln, Jefferson, Arkansas, and Lonoke Counties. These waters make up the last 52-mile segment of the main stem of the Arkansas River and Wabbaseka Bayou.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. Monitoring data was used to assess 52.2 stream miles of the Arkansas River within this segment and 101.7 miles of Wabbaseka Bayou. The remaining 32.7 stream miles were evaluated.

Wabbaseka Bayou is unable to maintain the dissolved oxygen standard for Channel Altered Delta streams. This is a naturally occurring problem throughout the Delta ecoregion during the critical season when flows are diminished and water temperatures are elevated. This issue will need to be addressed either through a standards change or an assessment methodology change.

Figure A-17: Planning Segment 3A



(Segment 3A)

Table A-23: Planning Segment 3A—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-3A																										
Arkansas River	8020401	-001	52.2	ARK0020	M	S	S	S	S	S	S									1				FISH CONSUMPTION	186.6	0
Arkansas River	8020401	-002	13.3		E	S	S	S	S	S	S									1				AQUATIC LIFE	84.9	101.7
Wabbaseka B.	8020401	-003	101.7	UWWSB01	M	S	N	S	S	S	S	UN				DO				5f				PRIMARY CONTACT	186.6	0
Arkansas River	8020401	-004	19.4		E	S	S	S	S	S	S									1				SECONDARY CONTACT	186.6	0
TOTAL MILES	186.6																							DRINKING SUPPLY	186.6	0
MILES UNASSESSED	0.0																							AGRI & INDUSTRY	186.6	0
MILES EVALUATED	32.7																									
MILES MONITORED	153.9																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0020	Arkansas River at Lock and Dam No. 2	Y	1	A
UWWSB01	Wabbaseka Bayou at Highway 79 near Wabbaseka		2	R

Table A-24: Segment 3A Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0035980	AR DEPT OF CORRECTION-TUCKER	WABBSEKA BU	08020401	003	1
AR0039896	WABBASEKA, CITY OF	TRIB,BRADLEY SLU,ARKANSAS RV	08020401	003	2

SEGMENT 3B BAYOU METO AND TRIBUTARIES

Segment 3B is located in the east central portion of Arkansas and includes a major portion of Lonoke County as well as parts of Arkansas, Jefferson, Faulkner, Pulaski, and Prairie Counties. Bayou Meto and its tributaries comprise the major surface water resource in the segment. Major tributaries include Bayou Two Prairie, Mill Bayou, and Kings Bayou.

Summary of Water Quality Conditions

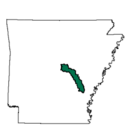
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. This segment contains a total of 233.7 stream miles, of which the majority is being assessed. This report uses monitoring data from four monthly stations and one quarterly station to assess 183.1 miles of stream. The monitoring data from these stations was also used to evaluate an additional 4.3 miles of streams. The remaining 46.3 miles of stream were unassessed.

The upper segments of Bayou Meto are under a fish consumption advisory because of the presence of dioxin in fish tissue. The source has been eliminated and the contamination is being addressed through natural attenuation.

Many segments of Bayou Meto and a segment of Bayou Two Prairie are listed because of low dissolved oxygen concentrations. This is a naturally occurring problem throughout the Delta ecoregion during the critical season when flows are diminished and water temperatures are elevated. This issue will need to be addressed either through a standards change or an assessment methodology change.

Water quality assessments on the upper portion of Bayou Meto indicate excessive levels of copper and lead. The source of the metals is thought to be from point source discharges located in the watershed.

Figure A-18: Planning Segment 3B



(Segment 3B)

Table A-25: Planning Segment 3B—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-3B																										
Bayou Meto	8020402	-001	4.3		E	S	N	S	S	S	S	UN				DO				5f				FISH CONSUMPTION	142.6	44.8
Bayou Meto	8020402	-003	39.8	ARK0023	M	S	N	S	S	S	S	UN				DO				5f				AQUATIC LIFE	41.5	145.9
Bayou Meto	8020402	-005	41.5	UWBMO02+	M	S	S	S	S	S	S									1				PRIMARY CONTACT	187.4	0
Bayou Meto[1]	8020402	-907	12.3	ARK0060	M	S	N	S	S	S	S	UN	UN			Pb	DO			5d	5f			SECONDARY CONTACT	187.4	0
Bayou Meto[2]	8020402	-007	44.8	ARK0050	M	N	N	S	S	S	S	IP	IP			PO	Cu			5e	5e			DRINKING SUPPLY	187.4	0
Mill Bayou	8020402	-002	31.0		U															3				AGRI & INDUSTRY	187.4	0
Kings Bayou	8020402	-004	15.3		U															3						
B.Two Prairie	8020402	-006	44.7	ARK0097	M	S	N	S	S	S	S	UN				DO				5f						
TOTAL MILES	233.7																									
MILES UNASSESSED	46.3																									
MILES EVALUATED	4.3																									
MILES MONITORED	183.1																									

1 Reach formally -907
2 Reach formally -007

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0023	Bayou Meto near Bayou Meto		1	A
UWBMO01	Bayou Meto at county road crossing southeast of Seaton Dump		2	R
UWBMO02	Bayou Meto at Highway 79, 2 miles southwest of Stuttgart		2	R
ARK0060	Bayou Meto at west Main Street in Jacksonville		1	A
ARK0050	Bayou Meto at Highway 161 below Jacksonville		1	A
ARK0097	Bayou Two Prairie south of Carlisle		1	A

Table A-26: Segment 3B Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0001163	REMINGTON ARMS COMPANY, INC	BU METO,ARKANSAS RV	08020402	007B	1
AR0021661	CABOT WATER & WASTEWATER COMM.	TRIB, BU TWO PRAIRIE,BU METO	08020402	006	2
AR0022284	HUMPHREY, CITY OF	LATERAL #5 DIT,BEAR BU,SALT BU,AR R	08020402	005	3
AR0022390	GILLETT, CITY OF	BILL'S BU,FLAG LK,BU METO,AR RV	08020402	001	4
AR0033642	GRAVEL RIDGE SID #213	DIT,KELLOGG CK,BU METO	08020402		5
AR0033740	CARLISLE, CITY OF	BU TWO PRAIRIE,BU METO,ARKANSAS RV	08020402	007A	6
AR0034380	STUTTGART, CITY OF	DIT,KING BU,BU METO,ARKANSAS RV	08020402	004	7
AR0034746	LONOKE, CITY OF	BU TWO PRAIRIE,BU METO,AR RV	08020402	006	8
AR0037176	SHERWOOD, CITY OF-NORTH	TRIB,KELLOGG CK,BU METO,ARKANSAS RV	08020402	007A	9
AR0038075	RUNYAN SID #211	DIT,KELLOGG CK,BU METO,ARKANSAS RV	08020402	007A	10
AR0040126	MACON PROPERTY OWNERS ASSOCIAT	TRIB,BU METO,AR RV	08020402	007A	11
AR0041149	ARK MILITARY CAMP ROBINSON	5-MILE CK,TRAMMEL LK,BRUSHY ISLAND	08020402		12
AR0041335	JACKSONVILLE SEWER COMMISSION	BU METO,ARKANSAS RV	08020402	007B	13
AR0043761	ALMYRA, CITY OF	MILL BAYOU,BIG BU METO,AR RV	08020402	002	14
AR0044318	SKEETER HOLE, LLC	INK BU,ARKANSAS RV	08020402	007B	15
AR0044598	PCSSD-BAYOU METO ELEMEMENTARY	BU METO, AR RV	08020402	007A	16
AR0046311	ROGERS GROUP INC.-CABOT QUARRY	WHITE OAK BR,2 PRAIRIE BU,BU METO	08020402	006	17
AR0047309	ARKANSAS PRECAST CORP	TRIB,BU METO,ARKANSAS RV	08020402	007A	18
AR0048313	H.A.C.T. WW IMPROVEMENT DIST	CROOKED CK,BU METO,AR RV	08020402	005	19
AR0049875	PHIL ROD ACRES MOBILE HOME PAR	DIT,BLUE BR,BU TWO PRAIRIE,BU METO	08020402	006	20
AR0050687	HILSIDE BAYOU, LLC	BAYOU METO,ARKANSAS RV	08020402		21

SEGMENT 3C ARKANSAS RIVER AND TRIBUTARIES: LOCK & DAM #4 AND DAM #7

Segment 3C is located in central Arkansas and covers large portions of Pulaski and Jefferson Counties as well as small areas of Grant, Saline, Lonoke, and Perry Counties. The Arkansas River is the major surface water resource in this segment. The principal tributaries within this segment are Plum Bayou, Maumelle River, and Fourche Creek. Lake Pine Bluff and Lake Maumelle are located in this segment.

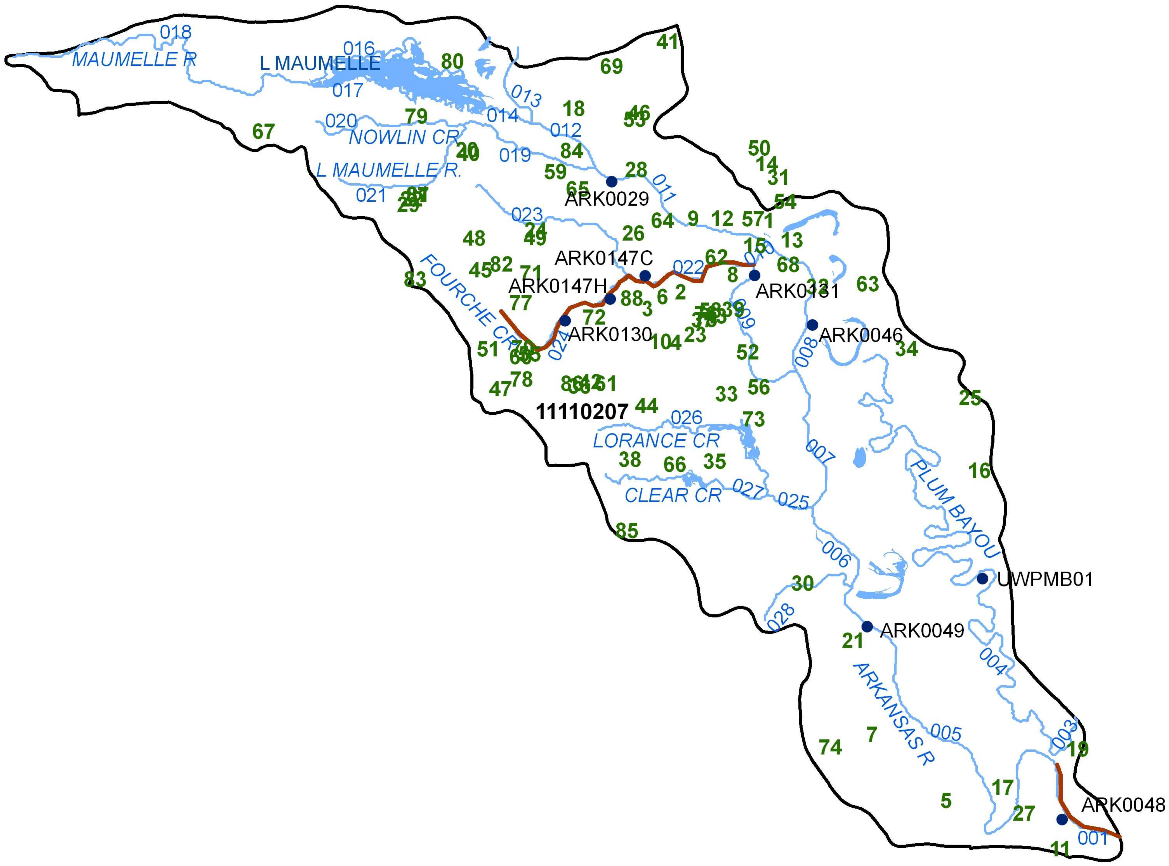
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. This planning segment contains a total of 291.8 stream miles, of which 225.1 miles were assessed. Four monitoring stations are located on the main stem of the Arkansas River which provides monitored data for 52.2 miles of the river; quarterly monitoring was conducted at 1 station on Plum Bayou. Data from USGS studies on the Maumelle River was used to assess this stream.

Although occasional high turbidity values occur in the Arkansas River within this planning segment, the value and frequency of occurrence are relatively low. As a result, the Arkansas River was assessed as supporting all designated uses except for one segment which was assessed as not meeting its drinking water use because of beryllium concentrations.

Fourche Creek, an Arkansas River tributary draining the Little Rock area, has been listed as not attaining the aquatic life use. The cause of the impairment is from low dissolved oxygen concentrations, elevated silt, turbidity, and metals (beryllium, lead, zinc) concentrations. The exact sources of the contamination are unknown at this time.

Figure A-19: Planning Segment 3C



(Segment 3C)

Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Figure A-20: Planning Segment 3C

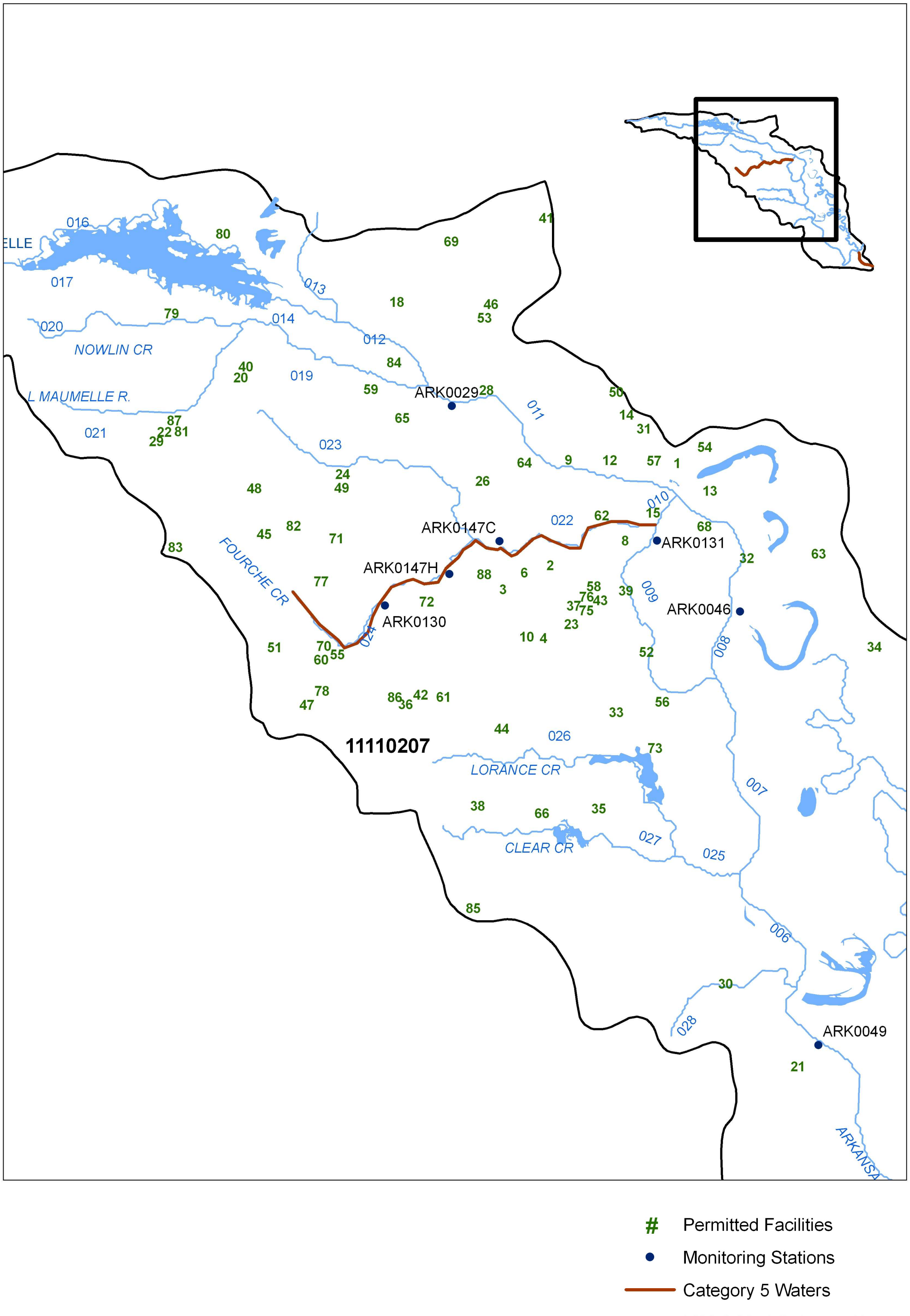


Table A-27: Planning Segment 3C—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-3C																										
Arkansas River	11110207	-001	6.7	ARK0048	M	S	S	S	S	N	S	UN				Be				5b				FISH CONSUMPTION	225.1	0
Plum Bayou	11110207	-002	0.3		M	S	S	S	S	S	S									1				AQUATIC LIFE	204.7	20.4
Indian Bayou	11110207	-003	3.2		U															3				PRIMARY CONTACT	225.1	0
Plum Bayou	11110207	-004	68.4	UWPMB01	M	S	S	S	S	S	S									1				SECONDARY CONTACT	225.1	0
Arkansas River	11110207	-005	28.0	ARK0049	M	S	S	S	S	S	S									1				DRINKING SUPPLY	207.2	17.9
Arkansas River	11110207	-006	6.2		E	S	S	S	S	S	S									1				AGRI & INDUSTRY	225.1	0
Arkansas River	11110207	-007	9.2		E	S	S	S	S	S	S									1						
Arkansas River	11110207	-008	9.8	ARK0046	M	S	S	S	S	S	S									1						
Fourche Bayou	11110207	-009	11.0		U															3						
Fourche Bayou	11110207	-010	1.6		U															3						
Arkansas River	11110207	-011	7.7	ARK0029	M	S	S	S	S	S	S									1						
Arkansas River	11110207	-012	5.1		M	S	S	S	S	S	S									1						
Arkansas River	11110207	-013	5.7		E	S	S	S	S	S	S									1						
Maumelle River	11110207	-014	3.3		E	S	S	S	S	S	S									1						
Maumelle River	11110207	-018	24.2	USGS	M	S	S	S	S	S	S									1						
Little Maumelle	11110207	-019	9.5	ARK0140	M	S	S	S	S	S	S									1						
Little Maumelle	11110207	-021	10.1		E	S	S	S	S	S	S									1						
Nowlin Creek	11110207	-020	10.5		E	S	S	S	S	S	S									1						
Fourche Creek	11110207	-022	9.2	ARK0131+	M	S	N	S	S	S	S	UN	SE	UN		DO	SI	PA		5f	5a	5g				
Rock Creek	11110207	-023	13.0		U															3						
Fourche Creek	11110207	-024	11.2	ARK0130+	M	S	N	S	S	N	S	UN	UN	UN	SE	DO	1	PA	SI	5f	5d	5g	5a			
Clear Creek	11110207	-025	3.2		U															3						
Lorance Creek	11110207	-026	15.2		U															3						
Clear Creek	11110207	-027	11.9		U															3						
Tar Camp Creek	11110207	-028	7.6		U															3						
TOTAL MILES	291.8															1=Be, Cu, Zn										
MILES UNASSESSED	66.7																									
MILES EVALUATED	45.0																									
MILES MONITORED	180.1																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0048	Arkansas River below Pine Bluff, Lock and Dam No. 4	Y	1	A
UWPMB01	Plum Bayou 1 mile west of Highway 15 near Tucker		2	R
ARK0049	Arkansas River above Pine Bluff, Lock and Dam No. 5	Y	1	A
ARK0046	Arkansas River at Lock and Dam No. 6	Y	1	A
ARK0029	Arkansas River at Murray Lock and Dam		1	A
ARK0140	Little Maumelle River near Little Rock		2	R
ARK0147H	Fourche Creek		1	S
ARK0147G	Fourche Creek		1	S
ARK0147F	Fourche Creek		1	S
ARK0147E	Fourche Creek		1	S
ARK0130	Fourche Creek at I-430 bridge in Little Rock		1	R
ARK0147D	Fourche Creek		1	S
ARK0147C	Fourche Creek		1	S
ARK0147B	Fourche Creek		1	S
ARK0147A	Fourche Creek		1	S
ARK0131	Fourche Creek at Fourche Dam Pike road of I-440 in Little Rock		1	R

Table A-28: Segment 3C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0001376	ENTERGY-CECIL LYNCH STEAM ELEC	ARKANSAS RV	11110207		1
AR0001414	MINNESOTA MINING & MFG-ARCH ST	TRIB,FOURCHE CK,ARKANSAS RV	11110207	022	2
AR0001449	CELESTICA SERVICES, INC	LTL FOURCHE CK TRIB	11110207	022	3
AR0001503	MCGEORGE CONTRACTING CO, INC -	LTL FOURCHE CK TRIB,LITL FOURCHE CK	11110207	022	4
AR0001601	DELTA NAT KRAFT/MID-AM PACK	ARKANSAS RV	11110207	005	5
AR0001635	SMITH FIBERCAST	TRIB,FOURCHE CK,ARKANSAS RV	11110207	022	6
AR0001678	USA-PINE BLUFF ARSENAL	TRIB/PHILLIPS CK & ARKANSAS RV	11110207	005	7
AR0001686	MINNESOTA MINING & MFG-COLLEGE	TRIB,FOURCHE CK,ARKANSAS RV	11110207	022	8
AR0001775	UNION PACIFIC RAILROAD COMPANY	E & W BR/DARK HOLLOW CANAL,ARKANSAS	11110207	011	9
AR0001848	POROCEL CORPORATION	BAUXITE PIT,DIT,WILLOW BR,FOURCHE C	11110207		10
AR0001970	EVERGREEN PACKAGING-PINE BLUFF	AR RV-3C (1) & COUSART BU-2B (2)	11110207	005	11
AR0002542	ALLEN GRANITE INDUSTRIES, INC	TRIB,INK BU,ARKANSAS RV	11110207		12
AR0020303	N LITTLE ROCK WW UTILITY-FAULK	ARKANSAS RV	11110207		13
AR0020320	N LITTLE ROCK WW UTILITY-FIVE	ARKANSAS RV	11110207		14
AR0021806	LITTLE ROCK WW UTILITY-ADAMS F	ARKANSAS RV	11110207		15
AR0022128	ENGLAND, CITY OF	WABBASEKA BU,PLUM BU,ARKANSAS RV	11110207	004	16
AR0033316	PINE BLUFF WW UTILITY-BOYD PT	ARKANSAS RV	11110207	005	17
AR0033626	MAUMELLE IMPROVE DISTRICT #500	ARKANSAS RV	11110207		18
AR0034771	ALTHEIMER, CITY OF	ARKANSAS RV	11110207		19
AR0035963	PCSSD-ROBINSON ELEMENTARY SCHO	TRIB,LTL MAUMELLE RV,AR RV	11110207	021	20
AR0036331	ENTERGY-WHITE BLUFF PLANT	ARKANSAS RV	11110207	005	21
AR0036421	FERNCLIFF CAMP & CONFERENCE CE	TRIB,LTL MAUMELLE RV,ARKANSAS RV	11110207	021	22
AR0036447	GEO SPECIALTY CHEMICALS-WINROC	FISH CK,AR RV	11110207		23
AR0037338	BAKER SCHOOL APARTMENTS-CHASE	PANTHER BR,BRODIE CK,FOURCHE CK	11110207	023	24
AR0037613	KEO, CITY OF	TRIB,NORTH BU,PLUM BU,AR RV	11110207	004	25
AR0037745	LITTLE ROCK ZOOLOGICAL GARDENS	COLEMAN CK,FOURCHE CK,AR RV	11110207		26
AR0038181	ALLIED TUBE & CONDUIT	LK LANHOFER,ARKANSAS RV	11110207	005	27
AR0038288	N LITTLE ROCK WW UTILITY-WHITE	ARKANSAS RV	11110207		28
AR0039250	AR 4-H EDUCATION CENTER-FERNDA	FERNDALE CK,LTL MAUMELLE RV,AR RV	11110207	021	29
AR0039357	REDFIELD, CITY OF	TAR CAMP DR, ARKANSAS RV	11110207	028	30
AR0039543	MCALMONT CHURCH OF CHRIST-NLR	STARK BEND,FAULKNER LK	11110207		31
AR0040177	LITTLE ROCK, CITY OF-FOURCHE C	ARKANSAS RV	11110207	008	32
AR0040266	ONE FORTY-FIFTH ST WTR&SID#345	CANE CK,FISH CK,LARANCE CK,PENNINGT	11110207		33
AR0040380	AR PARKS & TOURISM-TOLTEC MOUN	DIT,NORTH BU,PLUM BU,ARKANSAS RV	11110207	003	34
AR0040860	MAPLE CREEK POA-SID #1	MAPLE CK,PENNINGTON BU	11110207	027	35
AR0041424	PLEASANT OAKS POA	TRIB,OTTER CK,FOURCHE CK	11110207		36
AR0042544	CRILANCO OIL INC	TRIB,FISH CK,BIG LK,PENNINGTON BU	11110207		37
AR0042862	SHERIDAN SCHOOL DIST-EAST END	TRIB,MCCRIGHT BR,LORRANCE CK,BIG LK	11110207	026	38
AR0042927	PCSSD-AUXILIARY SERVICE FAC	FOURCHE BU,ARKANSAS RV	11110207		39
AR0043893	PCSSD-ROBINSON HIGH SCHOOL	DIT,TRIB,LTL MAUMELLE RV	11110207		40
AR0043931	DIXON MANOR MOBILE HOME PARK	TRIB,FISH CK,ARKANSAS RV	11110207		41
AR0044393	HEINKE ROAD PROPERTY OWNERS SE	TRIB,LTL FOURCHE CK,FOURCHE CK	11110207		42
AR0044601	PCSSD-FULLER SCHOOL TREATMENT	TRIB,FISH CK	11110207		43
AR0044610	PCSSD-LANDMARK ELEMENTARY SCHO	TRIB,TREADWAY BR,LORANCE CK	11110207	026	44
AR0044628	PCSSD-LAWSON ELEMENTARY SCHOOL	DIT,TRIB,FOURCHE CK,ARKANSAS RV	11110207		45

AR0044750	PCSSD-OAK GROVE HIGH SCHOOL	DIT,NEWTON CK,WHITE OAK BU	11110207		46
AR0044881	SALINE COUNTY WATERWORKS & SAN	CROOKED CK,FOURCHE CK,ARKANSAS RV	11110207	024	47
AR0045471	YOUTH HOME, INC.	MCHENRY CK,FOURCHE CK,ARKANSAS RV	11110207	023	48
AR0045560	OASIS RENEWAL CENTER	BRODIE CK,FOURCHE CK,ARKANSAS RV	11110207	023	49
AR0045608	SHERWOOD, CITY OF-SOUTH FAC.	WOODRUFF CK,FIVE MILE CK,BU METO,AR	11110207		50
AR0046051	QUAIL RIDGE SUBDIVISION	OWEN CK,FOURCHE CK	11110207	024	51
AR0046060	PULASKI COUNTY SID #221	FOURCHE BU TRIB,ARKANSAS RV	11110207		52
AR0046086	BLEMS, INC	TRIB,NEWTON CK	11110207		53
AR0046299	MAVERICK TRANSPORTATION, INC	DIT,STARK BEND TRIB,FAULKNER LK	11110207		54
AR0046302	K MOBILE HOME PARK (EAST)	FOURCHE CK,ARKANSAS RV	11110207	024	55
AR0046370	WRIGHTSVILLE, CITY OF	FOURCHE BU @ ARKANSAS RV	11110207		56
AR0046591	BEAZER EAST, INC.	DIT,REDWOOD TUNNEL	11110207		57
AR0046710	GRANITE MOUNTAIN QUARRIES	TRIB,FOURCHE CK,ARKANSAS RV	11110207		58
AR0046868	E.C. ROWLETT QUARRY & ASPHALT	WHITE OAK BU,AR RV	11110207	019	59
AR0047236	B & M MHP	TRIB,CROOKED CK,FOURCHE CK	11110207	024	60
AR0047261	NATIONAL SEWAGE SYSTEM, INC.	TRIB,LTL FOURCHE CK,FOURCHE CK	11110207		61
AR0047422	DAVIS RUBBER COMPANY	DIT,FOURCHE CK,ARKANSAS RV	11110207	022	62
AR0047449	PCSSD-SCOTT SCHOOL TREATMENT	ASHLEY BU,HORSESHOE LK,SCOTT BU	11110207		63
AR0047929	CENTRAL ARKANSAS WATER-OZARK	DIT,ARKANSAS RV	11110207		64
AR0047937	CENTRAL ARKANSAS WATER-JACK H.	TRIB,ROCK CK,FOURCHE CK, AR RV	11110207		65
AR0048399	MAPLE CREEK FARMS TRACT C H	TRIB,MAPLE CK,PENNINGTON BU	11110207	027	66
AR0048542	N LITTLE ROCK ELECTRIC-MURRAY	ARKANSAS RV	11110207		67
AR0048895	LITTLE ROCK HARBOR SERVICE, IN	ARKANSAS RV	11110207	008	68
AR0048968	CEDAR HEIGHTS BAPTIST CHURCH	WHITE OAK BU TRIB & BU,AR RV	11110207		69
AR0049042	OWEN CREEK WASTEWATER PLANT	OWEN CK,FOURCHE CK,ARKANSAS RV	11110207	024	70
AR0049051	HUMANE SOCIETY OF PULASKI CO	TRIB,MCHENRY CK,FOURCHE CK,AR RV	11110207		71
AR0049131	PARKER SOLVENTS COMPANY	WESSON SPRING,FOURCHE CK,ARKANSAS R	11110207	024	72
AR0049255	ARKANSAS ELECTRIC COOPERATIVE	ARKANSAS RV	11110207	026	73
AR0049581	THE FAMILY CHURCH	TRIB,ARNOLD CK,CANEY BU,LK LANGHOFE	11110207	005	74
AR0049956	DIXON STREET EXXON (CRILANCO O	TRIB,FISH CK	11110207		75
AR0050075	SEMMATERIALS, L.P.; FMRLY: K0C	TRIB,FISH CK,ARKANSAS RV	11110207		76
AR0050130	CALLAGHAN CREEK SUBDIVISION	CALLAGHAN CK,FOURCHE CK,ARKANSAS RV	11110207		77
AR0050181	JOSIE COMPANY, LLC	TRIB,CROOKED CREEK,FOURCHE CK,AR RV	11110207	022	78
AR0050245	ALOTIAN GOLF, LLC-D/B/A ALOTIA	NOWLIN CK,MAUMELLE RV,ARKANSAS RV	11110207	020	79
AR0050393	WATERVIEW ESTATES POA	MILL BU,ARKANSAS RV	11110207		80
AR0050504	FERNDALE GROCERY, INC	TRIB,LTL MAUMELLE RV,ARKANSAS RV	11110207		81
AR0050521	LOCHRIDGE ESTATES, LLC	MCHENRY CK,FOURCHE CK,ARKANSAS RV	11110207		82
AR0050539	CENTRAL ARKANSAS UTILITY SERV,	TRIB,PANTHER CK,FOURCHE CK,ARKANSAS	11110207		83
AR0050547	TWO RIVERS HARBOR SUBDIVISION	ARKANSAS RV	11110207		84
AR0050628	DEER CREEK SUBDIVISION	KELLY BR,DUCK CK,CLEAR CK,FERGUSON	11110207		85
AR0050636	SHANNON HILLS WWT FACILITY	OTTER CK,FOURCHE CK,ARKANSAS RV	11110207		86
AR0050639	BOB'S BISTRO	TRIB,LTL MAUMELLE RV,ARKANSAS RV	11110207		87
AR0050679	HILLCREST CAMSHAFT SERVICE	DIT,FOURCHE CK,ARKANSAS RV	11110207		88

SEGMENT 3D ARKANSAS RIVER AND TRIBUTARIES: LOCK & DAM #7 TO MORRILTON

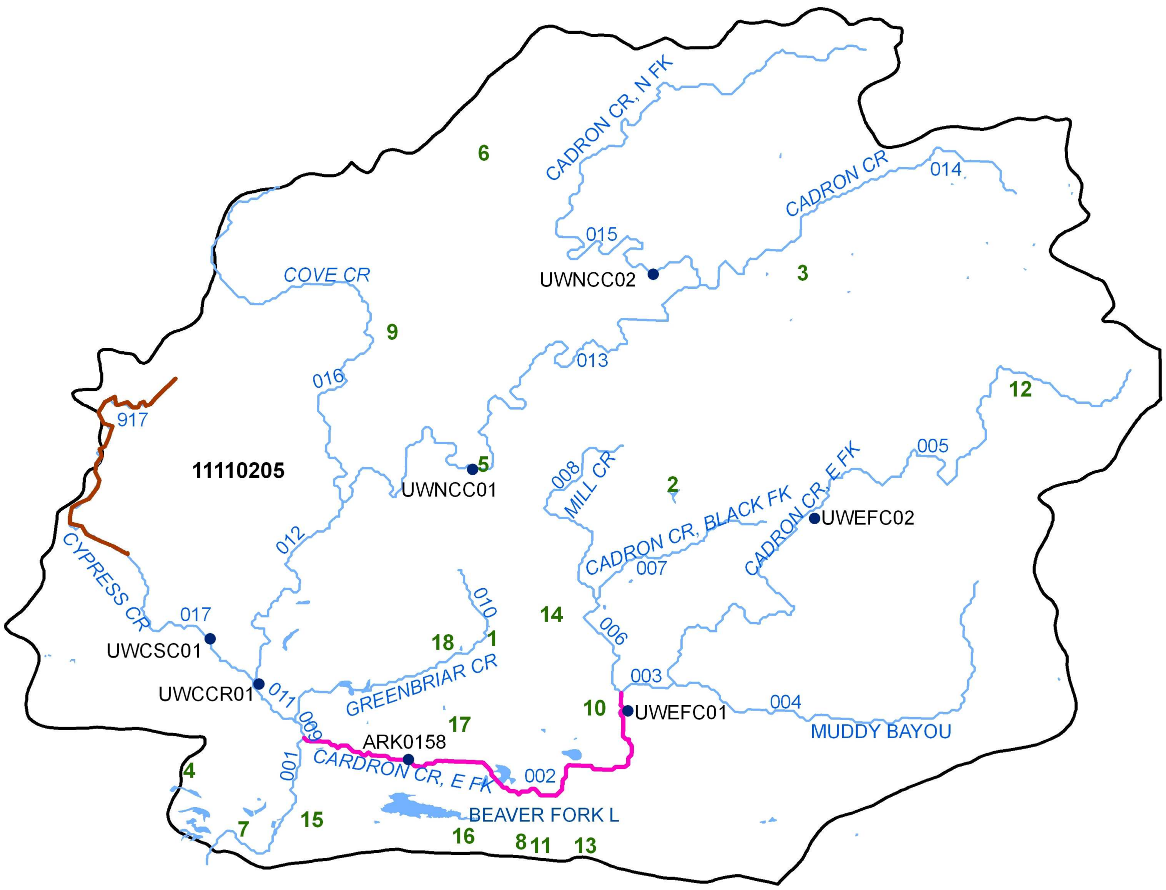
Segment 3D, located in central Arkansas, covers most of Conway County as well as parts of Cleburne, Van Buren, Faulkner, and White Counties. The principal waters include the Cadron Creek basin.

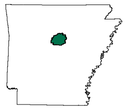
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supply. This planning segment contains a total of 220.5 stream miles, of which 118.7 stream miles were monitored. An additional 90.7 miles of stream were evaluated bringing the total miles of assessed stream to 209.4.

A small tributary to Cadron Creek, Cypress Creek, is currently not attaining the aquatic life use because of metals (copper, zinc) contamination. This is a very small tributary that ceases to flow during the critical season. The source of the metals contamination is suspected to be from agriculture activities, primarily confined animal operations, in the watershed.

Figure A-21: Planning Segment 3D





(Segment 3D)

Permitted Facilities

● Monitoring Stations

Category 5 Waters

EPA Added Category 5g

Table A-29: Planning Segment 3D—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-3D																										
Cadron Creek	11110205	-001	7.7		E	S	S	S	S	S	S									1				FISH CONSUMPTION	209.4	0
E. Fork Cadron	11110205	-002	15.6	UWEFC01	M	S	N	S	S	S	S	SE				SI				5g				AQUATIC LIFE	182.6	26.8
E. Fork Cadron	11110205	-003	2.0		E	S	S	S	S	S	S									1				PRIMARY CONTACT	209.4	0
E. Fork Cadron	11110205	-005	30.7	UWEFC02	M	S	S	S	S	S	S									1				SECONDARY CONTACT	209.4	0
Muddy Bayou	11110205	-004	15.7		E	S	S	S	S	S	S									1				DRINKING SUPPLY	209.4	0
Black Fork	11110205	-006	4.3		E	S	S	S	S	S	S									1				AGRI & INDUSTRY	209.4	0
Black Fork	11110205	-007	7.2		E	S	S	S	S	S	S									1						
Mill Creek	11110205	-008	8.9		E	S	S	S	S	S	S									1						
Cadron Creek	11110205	-009	0.7		E	S	S	S	S	S	S									1						
Cadron Creek	11110205	-011	2.2	UWCCR01	M	S	S	S	S	S	S									1						
Cadron Creek	11110205	-012	9.5		E	S	S	S	S	S	S									1						
Cadron Creek	11110205	-013	26.8	UWNCC01	M	S	S	S	S	S	S									1						
Cadron Creek	11110205	-014	14.7		E	S	S	S	S	S	S									1						
Greenbrier Cr.	11110205	-010	11.1		U																					
North Cadron	11110205	-015	26.5	UWNCC02	M	S	S	S	S	S	S									1						
Cove Creek	11110205	-016	20.0		E	S	S	S	S	S	S									1						
Cypress Creek[1]	11110205	-917	11.2	ARK0132	M	S	N	S	S	S	S	AG	AG			Cu	Zn			5d	5d					
Cypress Creek[2]	11110205	-017	5.7	UWCSC01	M	S	S	S	S	S	S									1						
TOTAL MILES	220.5																									
MILES UNASSESSED	11.1																									
MILES EVALUATED	90.7																									
MILES MONITORED	118.7																									

1 Reach formally -017A
2 Reach formally -017B

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0158	East Fork Cadron Creek near Wooster		1	A
UWEFC01	East Fork Cadron Creek at Highway 287, 3 miles southeast of Greenbrier		2	R
UWEFC02	East Fork Cadron Creek at Highway 107 near Barney		2	R
UWCCR01	Cadron Creek at county road, 5 miles west of Wooster		2	R
UWNCC01	North Cadron Creek at Highway 65 near Damascus		2	R
UWNCC02	North Cadron Creek at county road, 0.75 miles north of Highway 124		2	R
ARK0132	Cypress Creek at Highway 9 bridge near Cypress Valley		2	R
UWCSC01	Cypress Creek at county road, 2 miles southeast of Highway 92		2	R

Table A-30: Segment 3D Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0036536	GREENBRIER, CITY OF	GREENBRIER CK,CADRON CK,AR RV	11110205	010	1
AR0037087	ARK PARKS WOOLY HOLLOW	BLACK FORK CK,E FRK CADRON CK	11110205	007	2
AR0040321	QUITMAN, CITY OF	MILL CK,CADRON CK,ARKANSAS RV	11110205	014	3
AR0043028	GOOD EARTH HORTICULTURE, INC	TRIB,TANK LK,AR RV	11110203	010	4
AR0047112	ROGERS GROUP, INC-GREENBRIER	CADRON CK,ARKANSAS RV	11110205	013	5
AR0047457	CADRON CREEK CATFISH HOUSE	WARD CK TRIB,PINE MTN CK,COVE CK	11110205	013	6
AR0048119	EVERGREEN PACKAGING CADRON CRE	CADRON CK, AR RV	11110205	001	7
AR0048879	SHILOH CREEK ESTATES	TRIB,GOLD CK,LK CONWAY,PALARM CK,AR	11110203	004	8
AR0049077	BLASS SCOUT RESERVATION	COVE CK,CADRON CK,ARKANSAS RV	11110205	016	9
AR0049620	ARKAVALLEY AIRPARK	TRIB,E BRUSHY POND,E FORK CADRON CK,CADRON CK	11110205	002	10
AR0049832	JESSE FERREL RENTAL DEVELOPMEN	TRIB,LITTLE CK,LK CONWAY,PARLARM CK	11110205	005	11
AR0049913	DOGWOOD APARTMENTS	TRIB, E FORK CADRON CK,ARKANSAS RV	11110205	005	12
AR0050253	FRITTS CONSTRUCTION, INC D/B/A	TRIB,BENTLEY CK,PALARM CK,AR RV	11110203	005	13
AR0050440	GREENBRIER SPORTS PARK	TRIB,BLACK FORK,E FRK CADRON CK,...	11110205	007	14
AR0050466	SHADOW RIDGE WW TREATMENT FACI	E FK CADRON CK,CADRON CK,AR RV	11110205		15
AR0050491	NORTH HILLS SUBDIVISION WWTP	E FK CADRON CK,CADRON CK,AR RV	11110205		16
AR0050598	HUNTINGTON ESTATES SUBDIVISION	KANEY CK,E FRK CADRON CK,CADRON CK	11110205	002	17
AR0050768	STERLING MEADOWS SUBDIVISION WWTP	TRIB, GREENBRIER CK, CADRON CK, AR RV	11110205	010	18

SEGMENT 3E FOURCHE LAFAVE RIVER

Segment 3E, located in west central Arkansas, includes portions of Perry, Yell, and Scott Counties, and small portions of Saline and Polk Counties. This segment contains a 148-mile reach of the Fourche LaFave River and its tributary streams; Big Cedar Creek, Mill Creek, Gafford Creek, and South Fourche LaFave River. Major impoundments in this segment are Nimrod Lake (formed by a dam on Fourche LaFave River) and Harris Brake Lake.

Summary of Water Quality Conditions

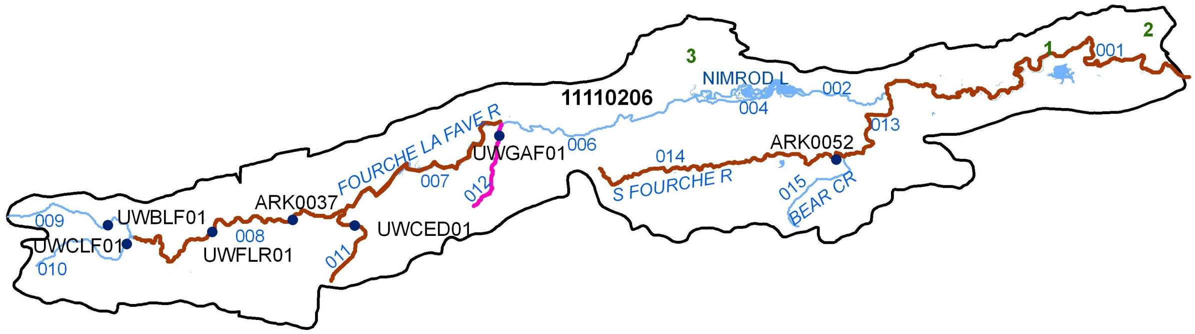
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. Monthly and roving water quality sampling stations were used to monitor 160.8 miles of stream; another 40.5 miles were also evaluated.

One segment of the Fourche LaFave River was assessed as not attaining the aquatic life use because of excessive turbidity. Previous data has shown occasional periods of elevated turbidity values which were associated with agriculture and silviculture activities. However, the construction and maintenance of an abundance of unpaved roads for timber access and general transportation is likely to be another contributing factor. A TMDL was completed in 2007.

Additional segments were listed in Category 5f because of low dissolved oxygen concentrations. These streams experience very low flow conditions reducing them to a series of large pools. With little to no water exchange in these pools, and high ambient air temperatures during the critical season, dissolved oxygen concentrations routinely fall below the ecoregion standard.

A statewide sampling effort has determined that some fishes from Lake Nimrod and the Fourche LaFave River below Nimrod Dam have elevated concentrations of mercury. A TMDL addressing this problem was completed in October 2002.

Figure A-22: Planning Segment 3E



(Segment 3E)

Table A-31: Planning Segment 3E—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-3E																										
Fourche LaFave	11110206	-001	44.4	ARK0036	M	S	N	S	S	S	S	UN				DO				5d				FISH CONSUMPTION	192.6	8.7
Fourche LaFave	11110206	-002	8.7		E	N	S	S	S	S	S	UN				Hg				4a				AQUATIC LIFE	56.5	144.8
Fourche LaFave	11110206	-006	21.5		E	S	S	S	S	S	S									1				PRIMARY CONTACT	201.3	0
Fourche LaFave	11110206	-007	20.2	ARK0037+	M	S	N	S	S	S	S	UN	SE			DO	SI			5f	5a			SECONDARY CONTACT	201.3	0
Fourche LaFave	11110206	-008	25.7	UWFLR01	M	S	N	S	S	S	S	UN				pH				5f				DRINKING SUPPLY	201.3	0
Black Fork	11110206	-009	14.3	UWBLF01	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	201.3	0
Clear Fork	11110206	-010	12.0	UWCLF01	M	S	S	S	S	S	S									1						
Cedar Creek	11110206	-011	9.6	UWCED01	M	S	N	S	S	S	S	UN				pH				5f						
Gafford Creek	11110206	-012	8.5	UWGAF01	M	S	N	S	S	S	S	UN				pH				5g						
S.FourcheLaFave	11110206	-013	10.3		E	S	N	S	S	S	S	UN				DO				5f						
S.FourcheLaFave	11110206	-014	26.1	ARK0052	M	S	N	S	S	S	S	UN				DO				5f						
Bear Creek	11110206	-015	10.2		U															3						
TOTAL MILES	211.5																									
MILES UNASSESSED	10.2																									
MILES EVALUATED	40.5																									
MILES MONITORED	160.8																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0036	Fourche La Fave River at Highway 113 south of Bigelow		1	R
ARK0037A	Fourche La Fave River near Harvey		2	A
ARK0037	Fourche La Fave River near Gravelly	Y	1	A
UWFLR01	Fourche La Fave River at county road near Bluffton		1	R
UWBLF01	Black Fork at county road 3.5 miles above Clear Fork		1	R
UWCLF01	Clear Fork at county road above Black fork, 8 miles west of Boyles		1	R
UWCED01	Big Cedar Creek at Highway 28, 3 miles east of Cedar Creek		1	R
UWGAF01	Gafford Creek at Highway 28 near Bluffton		1	R
ARK0052	South Fourche La Fave River above Hollis	Y	1	A

Table A-32: Segment 3E Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0020125	PERRYVILLE, CITY OF	FOURCHE LAFAVE RV	11110206	001	1
AR0046957	EAST END SCHOOL DISTRICT	TRIB,MILL CK,FOURCHE LAFAVE RV,AR R	11110206	001	2
AR0049344	PLAINVIEW, CITY OF	SALLY SPRING BRANCH,LAKE NIMROD	11110206	004	3

SEGMENT 3F ARKANSAS RIVER

Segment 3F is located in the central portion of Arkansas and covers parts of Faulkner, Conway, Perry, Pope, and Van Buren Counties. This segment contains the Arkansas River and its tributaries; East and West Forks of Point Remove Creek, Overcup Creek, Gum Log Creek, Palarm Creek, and Galla Creek.

Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. This segment contains a total of 310.8 streams miles. Ten monitoring stations within this segment allow for the assessment of 92.8 streams miles with an additional 99.1 miles of stream being evaluated. The remaining stream segments were unassessed.

Stone Dam Creek is impaired by a municipal point source discharge. Chronic ammonia toxicity and elevated nitrate levels exceeding the drinking water maximum contaminant level. A TMDL to address these issues was completed in 2003.

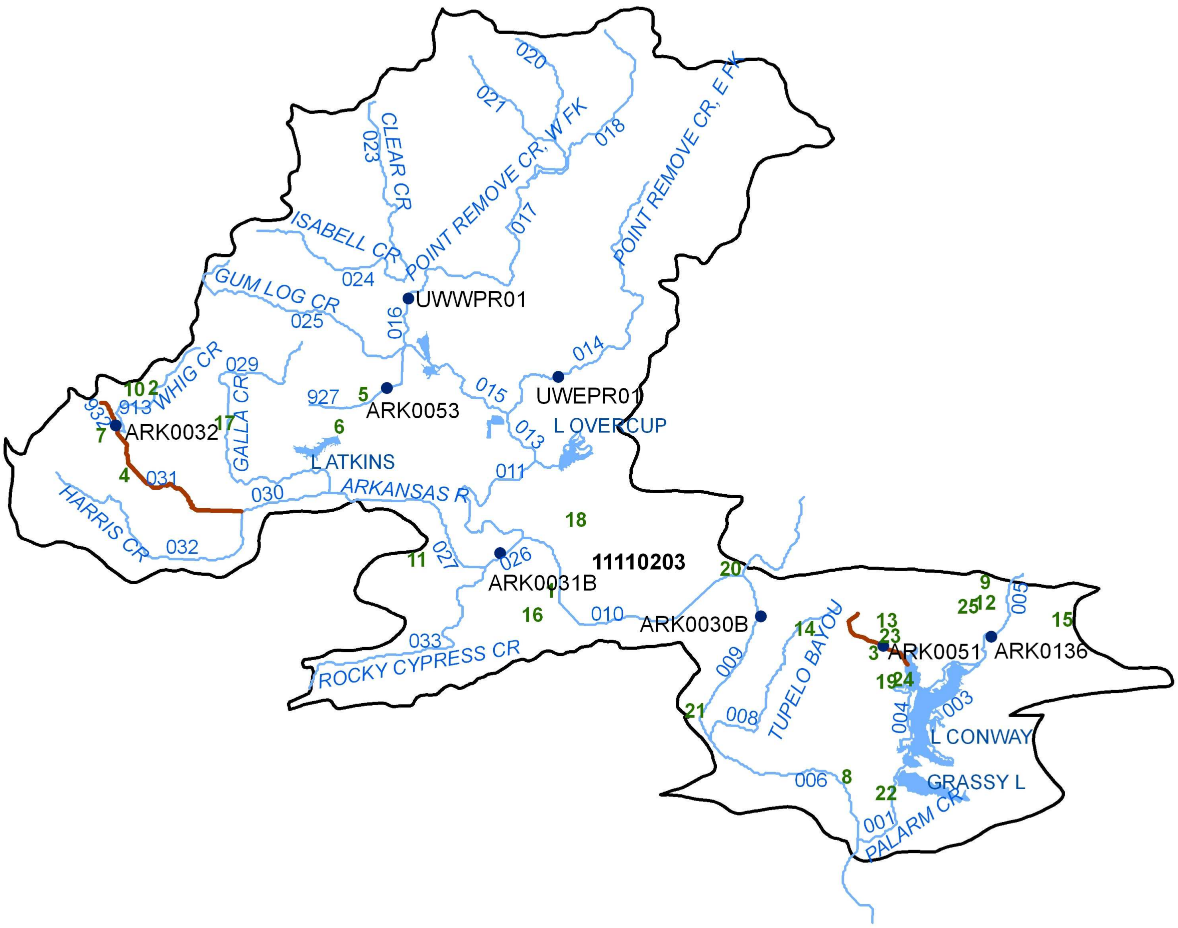
Whig Creek continues to be impaired by municipal and industrial point source discharges. Elevated levels of nutrients and copper are the cause of the impairment. A TMDL has been completed for this waterbody.

White Oak Creek continues to be listed for high silt and turbidity levels. Nonpoint sources appear to be the major problem. A TMDL addressing this issue was completed in 2006.

An approximate two mile segment of the Arkansas River below Dardanelle Reservoir occasionally had dissolved oxygen (D.O.) values below the standard during the summer period. This is related to hydropower releases from the upstream reservoir when very low D.O. values exist in the deeper levels of the reservoir. These low values seem to recover quickly downstream of the reservoir under low to moderate generation flows and in the presence of photosynthesis activity from planktonic algae.

Several segments of the Arkansas River had total dissolved solids concentrations above the standard. Most of the exceedances occurred over a five to six month span during the winter months of 2002 and 2003 (Figure A-24). This suggests that this was a one-time weather related event and not a chronic problem. In addition, trends analysis indicates that there is a decreasing concentration trend over the past ten years.

Figure A-23: Planning Segment 3F



\# Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

(Segment 3F)

Table A-33: Planning Segment 3F—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-3F																										
Palarm Creek	11110203	-001	6.4		U															3				FISH CONSUMPTION	191.9	0
Stone Dam Creek	11110203	-904	3.0	ARK0051	M	S	N	S	S	N	S	MP	MP	UN		AM	NO3	Zn		4a	4a	5d		AQUATIC LIFE	157.5	34.4
Palarm Creek	11110203	-005	6.6	ARK0136	M	S	S	S	S	S	S									1				PRIMARY CONTACT	191.9	0
Arkansas River	11110203	-006	10.9		E	S	S	S	S	S	S									1				SECONDARY CONTACT	191.9	0
Arkansas River	11110203	-007	1.0		E	S	S	S	S	S	S									1				DRINKING SUPPLY	168.9	23
Tupelo Bayou	11110203	-008	13.0		U															3				AGRI & INDUSTRY	180.5	11.4
Arkansas River	11110203	-009	10.6	ARK0030	M	S	S	S	S	S	S									1						
Arkansas River	11110203	-010	16.4		E	S	S	S	S	S	S									1						
Point Remove	11110203	-011	13.1		U															3						
Point Remove	11110203	-013	3.5		U															3						
Overcup Creek	11110203	-012	7.5		U															3						
East Pt.Remove	11110203	-014	20.9	UWEPR01	M	S	S	S	S	S	S									1						
West Pt.Remove	11110203	-015	8.2		U															3						
West Pt.Remove	11110203	-016	3.3	UWWPR01	M	S	S	S	S	S	S									1						
West Pt.Remove	11110203	-017	14.4	ARK0151	M	S	S	S	S	S	S									1						
West Pt.Remove	11110203	-019	4.1		E	S	S	S	S	S	S									1						
Beardy Branch	11110203	-018	12.9		E	S	S	S	S	S	S									1						
Hill Creek	11110203	-020	7.3		E	S	S	S	S	S	S									1						
Brock Creek	11110203	-021	7.4		E	S	S	S	S	S	S									1						
Clear Creek	11110203	-022	0.7		E	S	S	S	S	S	S									1						
Clear Creek	11110203	-023	11.7		E	S	S	S	S	S	S									1						
Isabel Creek	11110203	-024	10.5		E	S	S	S	S	S	S									1						
Gum Log Creek	11110203	-025	15.8		U															3						
Arkansas River	11110203	-026	2.6	ARK0031	M	S	S	S	S	S	S									1						
Arkansas River	11110203	-027	9.9		E	S	S	S	S	S	S									1						
Arkansas River	11110203	-028	1.2		E	S	S	S	S	S	S									1						
Galla Creek	11110203	-029	20.1		U															3						
Arkansas River	11110203	-030	5.1		E	S	S	S	S	S	S									1						
Arkansas River[1]	11110203	-932	2.0		M	S	N	S	S	S	N	HP				DO				5a						
Arkansas River[2]	11110203	-031	9.4	ARK0032	M	S	N	S	S	S	N	UN				TDS				5f						
Harris Creek	11110203	-032	15.6		U															3						
Rocky Cypress	11110203	-033	15.7		U															3						
Whig Creek	11110203	-931	10.0	ARK0067	M	S	N	S	S	N	S	MP	MP			NO3	Cu			4a	4a					
White Oak Creek	11110203	-927	10.0	ARK0053	M	S	N	S	S	N	S	UN				SI				4a						
TOTAL MILES	310.8																									
MILES UNASSESSED	118.9																									
MILES EVALUATED	99.1																									
MILES MONITORED	92.8																									

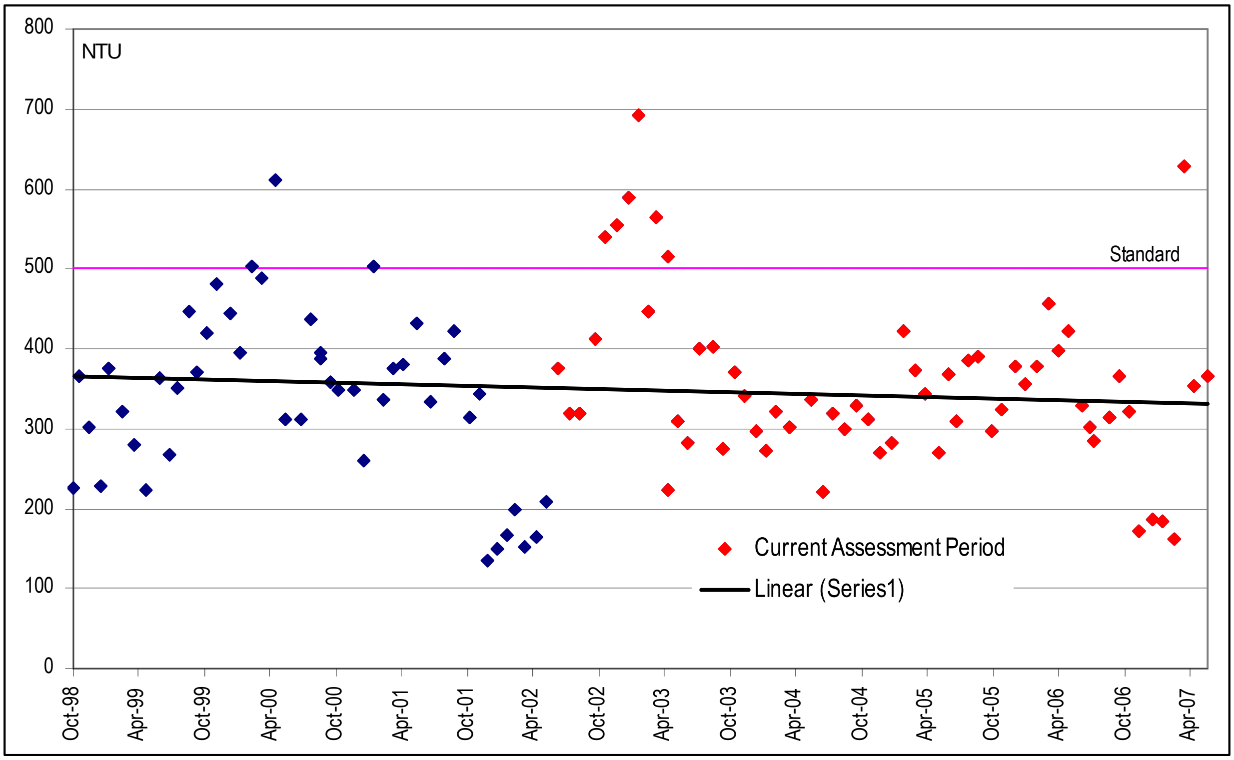
1 Reach formally -031U
2 Reach formally -031L

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0051	Stone Dam Creek below Conway		1	A
ARK0136	Palarm Creek at Highway 36 east of Conway		2	R
ARK0030B	Arkansas River at Lock and Dam No. 8	Y	1	A
UWEPR01	East Point Remove Creek at Highway 95 near Hickory Hill		2	R
UWWPR01	West Point Remove Creek at Highway 247 near Atkins		2	R
ARK0151	West Point Remove Creek at Highway 124 near Macedonia		2	R
ARK0031B	Arkansas River at Lock and Dam No. 9	Y	1	A
ARK0032	Arkansas River near Dardanelle	Y	1	A
ARK0067	Whig Creek below Russellville		1	A
ARK0053	White Oak Creek near Atkins		1	A

Table A-34: Segment 3F Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0001830	GREEN BAY PACKAGING/ARK KRAFT	TRIB,ARKANSAS RV	11110203	010	1
AR0021768	RUSSELLVILLE CITY CORPORATION	WHIG CK (001); ARKANSAS RV (002)	11110203	931	2
AR0033359	CONWAY, CITY OF-STONE DAM CREE	STONE DAM CK,LK CONWAY	11110203	904	3
AR0033421	DARDANELLE, CITY OF	ARKANSAS RV	11110203	031L	4
AR0034665	ATKINS, CITY OF-NORTH WWTF	ARKANSAS RV	11110203	927	5
AR0034673	ATKINS, CITY OF-SOUTH WWTP	HORSE PEN CK,GALLA CK,ARKANSAS RV	11110203		6
AR0036714	TYSON FOODS INC-DARDANELLE	ARKANSAS RV	11110203	031U	7
AR0037206	MAYFLOWER, CITY OF	ARKANSAS RV	11110203	006	8
AR0042536	ROLLING CREEK POA	WARREN CK TRIB,PALARM CK,LK CONWAY	11110203	005	9
AR0044474	FREEMAN BROTHERS, INCORPORATED	TRIB,WHIG CK,AR RV	11110203	931	10
AR0044717	CAMP MITCHELL CONFERENCE CENTE	TRIB,FLAT CYPRESS CK,CYPRESS CK	11110203		11
AR0044997	BHT INVESTMENT-EXXON FOOD MART	TRIB,WARREN CK,PALARM CK,LK CONWAY	11110203	005	12
AR0045071	MAPCO EXPRESS, INC-3059 CONWAY	TRIB,STONE DAM CK,LK CONWAY	11110203	904	13
AR0047279	CONWAY, CITY OF-TUCKER CREEK W	ARKANSAS RV	11110203	008	14
AR0047520	ROGERS GROUP, INC-BERYL QUARRY	TRIB,PALARM CK,LK CONWAY	11110203	005	15
AR0047643	OPPELO, CITY OF	TRIB,CYPRESS CK,ARKANSAS RV	11110203	010	16
AR0048011	POTTSVILLE, CITY OF	TRIB,GALLA CK,ARKANSAS RV	11110203	029	17
AR0048623	GERICORP, INC	CK,OLD RIVER LK,MILLER BU,AR RV	11110203	010	18
AR0048682	WILHELMINA COVE PROPERTY OWNER	GOLD CK,LK CONWAY,PALARM CK,AR RV	11110203	005	19
AR0049361	MENIFEE, CITY OF	TRIB,GAP CK,ARKANSAS RV	11110203		20
AR0049999	BIGELOW, CITY OF	TRIB,TAYLOR CK,ARKANSAS RV	11110203	009	21
AR0050334	GRASSY LAKE APARTMENTS	TRIB,PARLARM CK,ARKANSAS RV	11110203		22
AR0050474	CORESLAB STRUCTURES (ARKANSAS)	TRIB,STONE DAM CK,LK CONWAY,PARLARM	11110203		23
AR0050571	PRESTON & LAWRENCE LANDING ARE	LK CONWAY,ARKANSAS RV	11110203		24
AR0050792	OAK TREE SUBDIVISION	BENTLEY CK,PALARM CK, LK CONWAY, PALARM CK	11110203		25

Figure A-24: Arkansas River Total Dissolved Solids (TSS)



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SEGMENT 3G PETIT JEAN RIVER AND TRIBUTARIES

Segment 3G, located in west central Arkansas, includes portions of Yell, Conway, Perry, Logan, Sebastian, and Scott Counties. This segment includes the entire length of the Petit Jean River and its tributary streams. Major tributaries include Dutch Creek, Spring Creek, Chickalah Creek and Rose Creek. Blue Mountain Lake, formed by damming the Petit Jean River, is the largest impoundment in the segment.

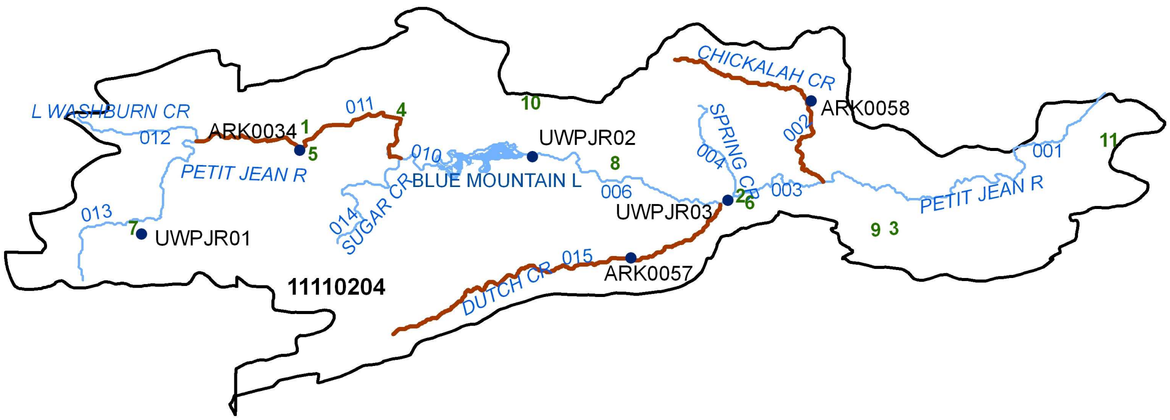
Summary of Water Quality Conditions

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supply. This planning segment contains 198.5 stream miles. Monitoring data were utilized to assess 108.2 stream miles; an additional 8.7 stream miles were also evaluated. The remaining stream miles within this segment did not have adequate information for assessment and are therefore listed as unassessed. The primary land use of the watersheds in this segment is agriculture activities (primarily pasture land) and timber harvest.

One segment of the Petit Jean River was listed as not attaining the public drinking water use because of the presence of beryllium. The three beryllium values detected, out of a total 20 samples, were all less than 0.20 ug/L. Contamination during the collection and analysis is a concern.

Two streams, Chickalah Creek and Dutch Creek (ecoregion reference streams), were listed in Category 5e because of low dissolved oxygen concentrations. Most of the low dissolved oxygen readings occurred during the late summer to early fall when the flow in the streams is minimal and the streams are reduced to small pools. This is a reoccurring problem in small Ouachita Mountain ecoregion streams.

Figure A-25: Planning Segment 3G



(Segment 3G)

Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-35: Planning Segment 3G—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-3G																										
Petit Jean R.	11110204	-001	30.1		U															3				FISH CONSUMPTION	116.9	0
Petit Jean R.	11110204	-003	8.7		E	S	S	S	S	S	S									1				AQUATIC LIFE	47.1	69.8
Petit Jean R.	11110204	-005	1.3	UWPJR03	M	S	S	S	S	S	S									1				PRIMARY CONTACT	116.9	0
Petit Jean R.	11110204	-006	17.9	UWPJR02	M	S	S	S	S	S	S									1				SECONDARY CONTACT	116.9	0
Petit Jean R.	11110204	-007	6.0		U															3				DRINKING SUPPLY	95.3	21.6
Petit Jean R.	11110204	-010	4.1		U															3				AGRI & INDUSTRY	116.9	0
Petit Jean R.	11110204	-011	21.6	ARK0034	M	S	N	S	S	N	S	UN				Be				5d						
Petit Jean R.	11110204	-013	19.2	UWPJR01	M	S	S	S	S	S	S									1						
Chickalah Cr.	11110204	-002	19.3	ARK0058	M	S	N	S	S	S	S	UN				SI				5f						
Spring Creek	11110204	-004	18.6		U															3						
L. Washburn Cr.	11110204	-012	10.0		U															3						
Sugar Creek	11110204	-014	12.8		U															3						
Dutch Creek	11110204	-015	28.9	ARK0057	M	S	N	S	S	S	S	UN				DO				5f						
TOTAL MILES	198.5																									
MILES UNASSESSED	81.6																									
MILES EVALUATED	8.7																									
MILES MONITORED	108.2																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
UWPJR03	Petit Jean River at Highway 10 at Danville		1	R
UWPJR02	Petit Jean River at Highway 309 near Waveland		1	R
ARK0034	Petit Jean River south of Booneville	Y	1	A
UWPJR01	Petit Jean River at county road off Highway 71 at Elm Park		1	R
ARK0058	Chickalah Creek at Chickalah	Y	1	A
ARK0057	Dutch Creek below Shark	Y	1	A

Table A-36: Segment 3G Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021571	BOONEVILLE, CITY OF	TRIB,COAL CR,PETIT JEAN RV,ARKANSAS RV	11110204	011	1
AR0022241	DANVILLE, CITY OF	PETIT JEAN RV	11110204	003	2
AR0035688	OLA, CITY OF	KEELAND CK,PETIT JEAN RV,AR RV	11110204	001	3
AR0037397	MAGAZINE, CITY OF	REVILLE CK TRIB,PETIT JEAN RV	11110204	011	4
AR0037541	BOONEVILLE HUMAN DEV CTR-ADHS	TRIB, PETIT JEAN RV	11110204	011	5
AR0038768	WAYNE FARMS, LLC	PETIT JEAN RV,AR RV	11110204	003	6
AR0045799	AR HWY DEPT-WALDRON REST AREA-	TRIB,PETIT JEAN RV	11110204	013	7
AR0046256	HAVANA, CITY OF	PETIT JEAN RV,ARKANSAS RV	11110204	006	8
AR0048640	DELTIC TIMBER CORP - OLA MILL	KEELAND CK,PETIT JEAN RV,ARKANSAS R	11110204	001	9
AR0048852	AR PARKS & TOURISM-MT MAGAZINE	W BASS CK,SMLLWD CK,ROCK CK,PETIT J	11110204	006	10
AR0049972	AR PARKS & TOURISM-PETIT JEAN	DIT,CEDAR CK,PETIT JEAN RV,AR RV	11110204	001	11

SEGMENT 3H ARKANSAS RIVER AND TRIBUTARIES: STATE LINE TO RIVER MILE 210

Segment 3H, located in the lower portion of the northwest quarter of Arkansas, includes most of Crawford, Franklin, and Johnson Counties as well as parts of Sebastian, Logan, Pope, Van Buren, Searcy, Newton, Madison, Yell, and Washington Counties. This segment contains a reach of the Arkansas River from the Oklahoma state line to the lower end of Lake Dardanelle. Major tributaries in this reach include Illinois Bayou, Big Piney Creek, Lee Creek, Mulberry River, Six Mile Creek, and Vache Grasse Creek.

Summary of Water Quality Conditions

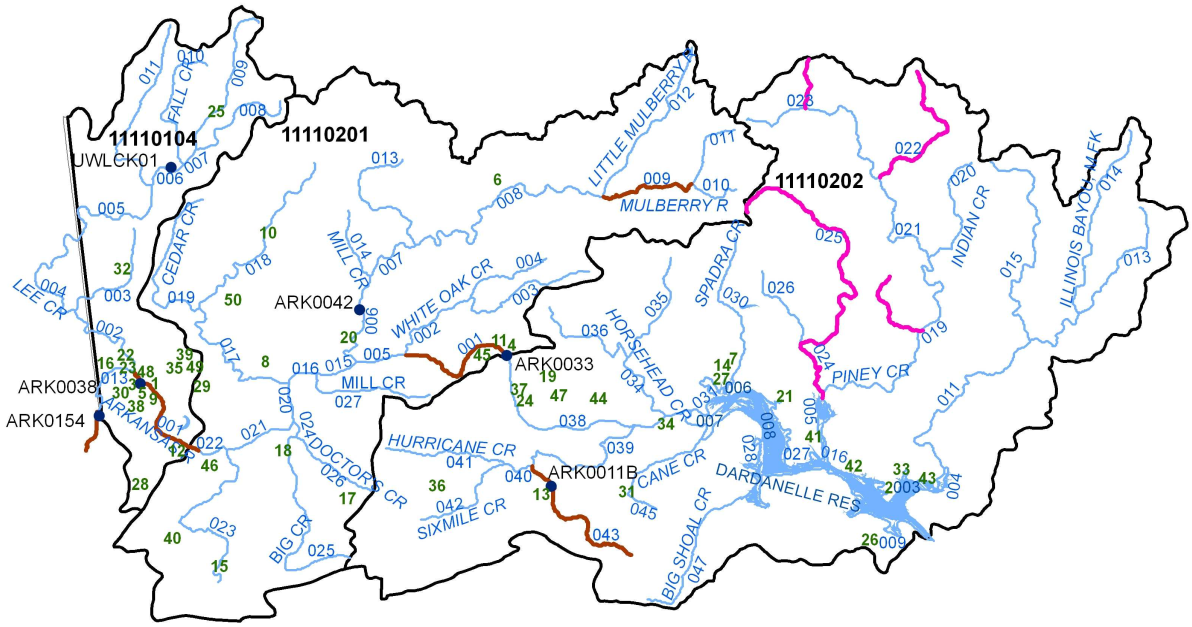
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supply. Seventeen monitoring stations are located within this segment. An intensive survey of the Big Piney Creek watershed and its tributaries was also used to asses the waters of this segment. Altogether, 365.2 miles of stream were monitored and another 261 stream miles were evaluated; the remainder of the stream segments were unassessed.

One segment of the Arkansas River was listed in Category 5f for excessive total dissolved solids concentrations. Most of the exceedances occurred over a five to six month span during the winter months of 2002 and 2003. This suggests that this was a one-time weather related event and not a chronic problem.

Short Mountain Creek is not maintaining the aquatic life use because of toxic copper concentrations. The source is a municipal point source discharge. The problem will be addressed through the NPDES program.

One segment of the Mulberry River, an ecoregion reference stream, was listed in Category 5f because of low pH values. The statewide pH standard of 6 to 9 standard units does not take into account natural variations because of geology or land use. In addition, there were only three exceedances of the standard, the lowest of which was a 5.49su reading. It is highly unlikely that this type of occasional exceedance is having any negative effect on the aquatic life communities in the stream.

Figure A-26: Planning Segment 3H



(Segment 3H)

Permitted Facilities
● Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-37: Planning Segment 3H—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS			
												1	2	3	4	1	2	3	4	1	2	3	4
SEG-3H																							
Arkansas River	11110202	-001	2.8		E	S	S	S	S	S	S									1			
Illinois Bayou	11110202	-011	21.0	ARK0044	M	S	S	S	S	S	S									1			
Illinois Bayou	11110202	-012	8.1	ARK0150	M	S	S	S	S	S	S									1			
Illinois Bayou	11110202	-013	14.1		E	S	S	S	S	S	S									1			
M.Fk.Ill.Bayou.	11110202	-014	19.8	ARK0149	M	S	S	S	S	S	S									1			
N.Fk.Ill.Bayou.	11110202	-015	24.0		E	S	S	S	S	S	S									1			
Piney Creek	11110202	-018	5.8	ARK0105	M	S	S	N	S	S	S	UN				PA				5g			
Piney Creek	11110202	-019	26.3	ARK0043	M	S	S	S	S	S	S									1			
Mill Creek	11110202	-901	8.6	ARK0110	M	S	S	N	S	S	S	UN				PA				5g			
Indian Creek	11110202	-020	12.2	ARK0114	M	S	S	S	S	S	S									1			
Piney Creek	11110202	-021	11.9		E	S	S	S	S	S	S									1			
Hurricane Creek	11110202	-022	15.4	ARK0119	M	S	S	N	S	S	S	UN				PA				5g			
Piney Creek	11110202	-023	19.0	ARK0124	M	S	S	S	S	S	S									1			
Walnut Creek	11110202	-902	5.1	ARK0125	M	S	S	N	S	S	S	UN				PA				5g			
Little Piney	11110202	-024	6.2	ARK0104	M	S	S	N	S	S	S	UN				PA				5g			
Minnow Creek	11110202	-026	9.5	ARK0129	M	S	S	S	S	S	S									1			
Little Piney	11110202	-025	27.2	ARK0126	M	S	S	N	S	S	S	UN				PA				5g			
Spadra Creek	11110202	-030	15.1	ARK0148	M	S	S	S	S	S	S									1			
Arkansas River	11110202	-033	2.5		E	S	S	S	S	S	S									1			
Horsehead Cr.	11110202	-034	7.9		E	S	S	S	S	S	S									1			
Horsehead Cr.	11110202	-035	11.2	ARK0137	M	S	S	S	S	S	S									1			
McKinney Cr.	11110202	-036	11.8		E	S	S	S	S	S	S									1			
Arkansas River	11110202	-037	3.2		E	S	S	S	S	S	S									1			
Arkansas River	11110202	-038	16.2		E	S	S	S	S	S	S									1			
Sixmile Creek	11110202	-039	14.6		U															3			
Sixmile Creek	11110202	-040	3.0		U															3			
Hurricane Creek	11110202	-041	11.6		U															3			
Sixmile Creek	11110202	-042	10.7		U															3			
Short Mountain	11110202	-043	14.9	ARK0011B	M	S	N	S	S	S	S	MP				Cu				5e			
Cane Creek	11110202	-045	12.3		U															3			
Big Shoal Cr.	11110202	-047	15.4		U															3			
Arkansas River	11110201	-001	12.4	ARK0033	M	S	S	S	S	S	N	UN				TDS				5f			
White Oak	11110201	-002	9.2		U															3			
S. Fork White Oak Cr.	11110201	-003	13.9		U															3			
N. Fork White Oak Cr.	11110201	-004	8.8		U															3			
Arkansas River	11110201	-005	4.5		U															3			
Mulberry River	11110201	-006	10.4	ARK0042	M	S	S	S	S	S	S									1			
Mulberry River	11110201	-007	6.4		E	S	S	S	S	S	S									1			
Mulberry River	11110201	-008	27.2	ARK0139	M	S	S	S	S	S	S									1			
Mulberry River	11110201	-009	9.1	ARK0138	M	S	N	S	S	S	S	UN				pH				5f			
Mulberry River	11110201	-010	5.1		E	S	S	S	S	S	S									1			
Panther Creek	11110201	-011	7.4		E	S	S	S	S	S	S									1			
Little Mulberry	11110201	-012	17.4		M	S	S	S	S	S	S									1			
Hurricane Creek	11110201	-013	14.8		E	S	S	S	S	S	S									1			
Mill Creek	11110201	-014	7.0		E	S	S	S	S	S	S									1			
Arkansas River	11110201	-015	3.9		E	S	S	S	S	S	S									1			
Arkansas River	11110201	-016	2.9		E	S	S	S	S	S	S									1			
Frog Bayou	11110201	-017	15.7		E	S	S	S	S	S	S									1			
Frog Bayou	11110201	-018	20.4	ARK0047	M	S	S	S	S	S	S									1			
Cedar Creek	11110201	-019	17.0		E	S	S	S	S	S	S									1			
Arkansas River	11110201	-020	3.5		E	S	S	S	S	S	S									1			
Arkansas River	11110201	-021	7.0		E	S	S	S	S	S	S									1			
Arkansas River	11110201	-022	3.0		E	S	S	S	S	S	S									1			
L. Vache Grass	11110201	-023	20.5		U															3			
Doctors Creek	11110201	-024	1.5		U															3			
Big Creek	11110201	-025	20.9		U															3			
Doctors Creek	11110201	-026	9.1		U															3			
Mill Creek	11110201	-027	11.9		U															3			

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	626.2	0
AQUATIC LIFE	591.2	35
PRIMARY CONTACT	557.9	68.3
SECONDARY CONTACT	626.2	0
DRINKING SUPPLY	615.2	11
AGRI & INDUSTRY	602.8	23.4

Table A-37 (cont.): Planning Segment 3H—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
Arkansas River	11110104	-001	11.0	ARK0038	M	S	N	S	S	N	N	UN	UN			CL	TDS			5f	5f					
Arkansas River	11110104	-013	17.0	ARK0146	M	S	S	S	S	S	S									1						
Lee Creek	11110104	-002	10.5	ARK0008	M	S	S	S	S	S	S									1						
Lee Creek	11110104	-005	11.4		E	S	S	S	S	S	S									1						
Lee Creek	11110104	-006	4.4	UWLCK01	M	S	S	S	S	S	S									1						
Lee Creek	11110104	-007	1.8		E	S	S	S	S	S	S									1						
Lee Creek	11110104	-008	12.3		E	S	S	S	S	S	S									1						
Fall Creek	11110104	-009	15.2		E	S	S	S	S	S	S									1						
Cove Creek	11110104	-010	13.3		E	S	S	S	S	S	S									1						
Mt. Fork Creek	11110104	-011	18.9		E	S	S	S	S	S	S									1						
TOTAL MILES	794.1																									
MILES UNASSESSED	167.9																									
MILES EVALUATED	261.0																									
MILES MONITORED	365.2																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0044	Illinois Bayou northwest of Dover	Y	1	A
ARK0149	North Fork Illinois Bayou on county road north of Scottsville		2	R
ARK0150	Illinois Bayou at Highway 27 north of Hector		2	R
ARK0105	Big Piney Creek at Highway 359, 6 miles east of Lamar		2	S
ARK0043	Big Piney Creek at Highway 164	Y	1	A
ARK0110	Mill Creek at county road 0.4 miles south of Highway 164 near Twin Bridges		2	S
ARK0114	Indian Creek at FAS road 1808 near Treat		2	S
ARK0119	Hurricane Creek at FAS road 1003 near Ft. Douglas		2	S
ARK0124	Big Piney Creek at FAS road 1458 south of Edwards Junction		2	S
ARK0125	Walnut Creek as FAS road 1217 south of Edwards Junction		2	S
ARK0104	Little Piney Creek at Highway 359 east of Lamar		2	R
ARK0129	Minnow Creek at county road 50 bridge, south of Hagarville		2	S
ARK0109	Unnamed tributary at Highway 164 bridge		2	S
ARK0126	Little Piney Creek at Highway 123 bridge near Hagarville		2	S
ARK0148	Spadra Creek at US 64 near Clarksville		2	R
ARK0137	Horsehead Creek at Highway 64 east of Hartman		2	R
ARK0011B	Short Mountain Creek below Paris		1	A
ARK0033	Arkansas River at Ozark Lock and Dam	Y	1	A
ARK0042	Mulberry River at I-40	Y	1	A
ARK0138	Mulberry River at Highway 103 west of Oark		2	R
ARK0139	Mulberry River 4.3 miles east of Highway 23 near Cass		2	R
ARK0047	Frog Bayou at Highway 282		1	A
ARK0038	Arkansas River near Fort Smith, AR.	Y	1	A
ARK0146	Arkansas River below Mayo Lock and Dam		2	A
ARK0008	Lee Creek at Highway 59 near Natural Dam		1	R
UWLCK01	Lee Creek at Highway 220, 10 miles north of Cedarville		2	R

Table A-38: Segment 3H Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0001341	ARKHOLA-VAN BUREN SAND PLANT	ARKANSAS RV	11110104	001	1
AR0001392	ENTERGY-ARKANSAS NUCLEAR ONE	LK DARDANELLE	11110202	003	2
AR0001511	GERBER PRODUCTS COMPANY	ARKANSAS RV	11110104	001	3
AR0001759	ARKANSAS ELECTRIC COOP-FITZHUG	ARKANSAS RV	11110201	001	4
AR0001791	DIXIE CONSUMER PRODUCTS LLC;	DIT,6TH ST DIT,ARKANSAS RV	11110104	001	5
AR0020648	USDAFS-CASS CIVILIAN CONSERVAT	MULBERRY RV	11110201	008	6
AR0020737	GREENVILLE TUBE COMPANY	DIT,SPADRA CK,LK DARDANELLE	11110202	030	7
AR0021466	ALMA, CITY OF	ARKANSAS RV	11110201	016	8
AR0021482	VAN BUREN, CITY OF-MAIN PLANT	ARKANSAS RV	11110104	001	9
AR0021512	MOUNTAINBURG, CITY OF	TRIB,PIGEON CK,FROG BU,ARKANSAS RV	11110201	018	10
AR0021563	OZARK, CITY OF	ARKANSAS RV	11110201	001	11
AR0021750	FORT SMITH, CITY OF (MASSARD W	ARKANSAS RV	11110104	001	12
AR0021857	PARIS, CITY OF-WASTEWATER TREA	SHORT MOUNTAIN CK,6-MILE CK	11110202	043	13
AR0022187	CLARKSVILLE, CITY OF	LK DARDANELLE (1) & SPADRE CK (2)	11110202	030	14
AR0022454	GREENWOOD, CITY OF	TRIB,VACHE GRASSE CK,ARKANSAS RV	11110201	023	15
AR0033278	FORT SMITH, CITY OF, "P" STREET	ARKANSAS RV	11110104		16
AR0033791	CHARLESTON, CITY OF	DOCTORS CK,BIG CK	11110201	024	17
AR0034070	LAVACA, CITY OF	ARKANSAS RV	11110201	021	18
AR0034592	WIEDERKEHR WINE CELLARS INC	WATERSHED LK,DIRTY CK,HORSEHEAD CK	11110202	034	19
AR0034932	MULBERRY, CITY OF	ARKANSAS RV	11110201	005	20
AR0035491	LAMAR, CITY OF	TRIB,CABIN CK,ARKANSAS RV	11110202	008	21
AR0036552	BEKAERT CORPORATION	ARKANSAS RV	11110104	002	22
AR0037567	VAN BUREN-LEE CREEK INDUSTRIAL	ARKANSAS RV	11110104	002	23
AR0037851	SGL CARBON LLC	TRIB,WEST CK,ARKANSAS RV	11110202	038	24
AR0037940	AR PARKS & TOURISM-DEVIL'S DEN	DIT,LEE CK,ARKANSAS RV	11110104	009	25
AR0037966	AR PARKS & TOURISM-MT NEBO STA	TRIB,CHICKALAH CK	11110202		26
AR0039268	TYSON FOODS INC-CLARKSVILLE	BLUE CK,SPADRA CK, AR RV	11110202	030	27
AR0039730	QUANEX CORP-MACSTEEL DIVISION	TRIB,MASSARD CK,ARKANSAS RV	11110104	001	28
AR0040720	VAN BUREN SCHOOL-TATE ELEM	TRIB,MAYS BRANCH,ARKANSAS RV	11110201	021	29
AR0040967	VAN BUREN, CITY OF-NORTH WWTP	LEE CK,ARKANSAS RV	11110104		30
AR0040991	SUBIACO, TOWN OF	UNNAMED TRIB,CANE CK,ARKANSAS RV	11110202	045	31
AR0041289	CEDARVILLE PUBLIC SCHOOLS	LTL WEBER CK TRIB,LEE CK	11110104	003	32
AR0042447	LAKE POINT CONFERENCE CENTER	LK DARDENELLE,ARKANSAS RV	11110202	003	33
AR0042455	TYSON FOODS INC-RIVER VALLEY	ARKANSAS RV	11110202	033	34
AR0044385	S&D PROPERTIES-D/B/A CABANA ES	FLAT ROCK CK TRIB	11110104	022	35
AR0044636	COUNTY LINE SCHOOL DISTRICT	N FRK/LITTLE CK,LITTLE CK,6-MILE CK	11110202	042	36
AR0044725	ALTUS, CITY OF	ARKANSAS RV	11110202	038	37
AR0044938	ECOLOGY MANAGEMENT, INC WASTEW	ARKANSAS RV	11110104	001	38
AR0045063	ARKHOLA-PRESTON QUARRY	TRIB,FLAT ROCK CK,AR RV	11110104	022	39
AR0045365	ARKHOLA-JENNY LIND QUARRY	DIT,BEAR CK,VACHE GRASSE CK	11110201	023	40
AR0045683	AR HWY DEPT-BIG PINEY EAST	TRIB,LK DARDENELLE,AR RV	11110202	005	41
AR0045691	AR HWY DEPT-BIG PINEY WEST	TRIB,LK DARDENELLE,AR RV	11110202	004	42
AR0046396	PLEASANT VIEW ESTATES	TRIB,LK DARDANELLE	11110202	003	43
AR0047686	COAL HILL, CITY OF	ARKANSAS RV	11110202		44

AR0048267	BUTTERBALL, LLC.	ARKANSAS RV	11110201	001	45
AR0048801	BARLING, CITY OF	ARKANSAS RV	11110201		46
AR0049212	BUTTERBALL, LLC;	TRIB,CEDAR CK, AR RV	11110202		47
AR0049808	SAINT-GOBAIN PROPPANTS	DIT,ARKANSAS RV	11110104		48
AR0050199	LENDEL VINES CO. D/B/A LENDEL	DIT,TRIB,FLAT ROCK CK,HOLLIS LK	11110104	022	49
AR0050725	HILLTOP TRAVEL CENTER	I-540 DIT,TRIB,LK ALMA,LTL FROG BU	11110201		50

SEGMENT 3I POTEAU RIVER

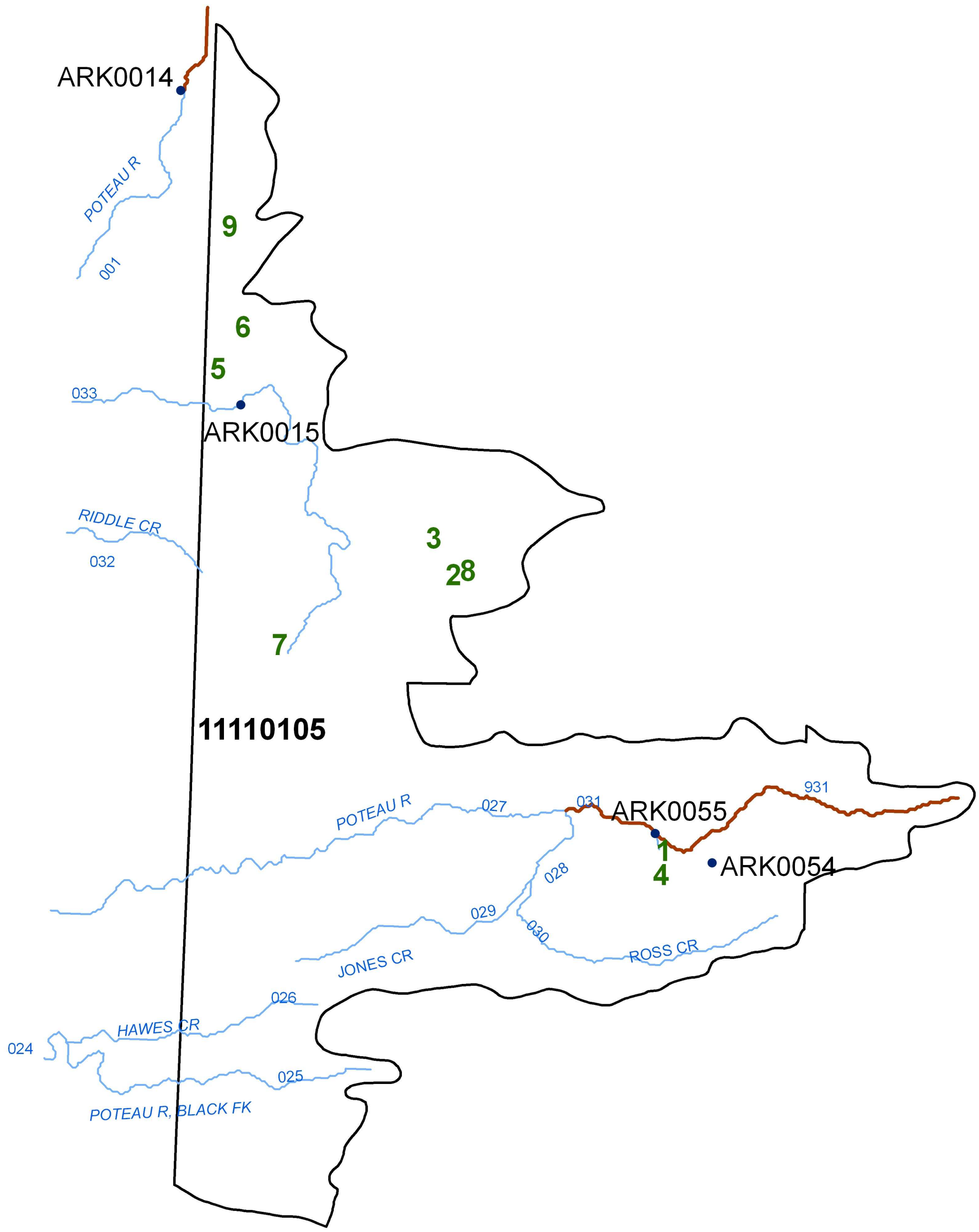
Segment 3I is located on the western edge of Arkansas, just south of the Arkansas River. This segment includes large portions of Scott and Sebastian Counties and a small part of northwestern Polk County. The waters of this segment include the Poteau River from its headwaters to the Oklahoma state line, as well as the tributary streams. Major tributaries include Jones Creek and James Fork.

Summary of Water Quality Condition

The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. This planning segment contains 105.3 stream miles. Five monitoring stations, including one operated by USGS, are located within this segment and were utilized to assess 55.8 stream miles. The remaining 49.5 miles were unassessed.

A short section of the Poteau River below Waldron was listed as not supporting aquatic life uses due to elevated metals and total phosphorus. Both a municipal and industrial discharge occurs in this segment. In addition, a short section of the Poteau River just above its confluence with the Arkansas River was listed as not supporting the aquatic life use because of excessive turbidity. A TMDL to address these issues was completed in 2006.

Figure A-27: Planning Segment 3I



(Segment 3I)

Permitted Facilities
Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-39: Planning Segment 3I—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-3I																										
Poteau River	11110105	-001	2.0	ARK0014	M	S	N	S	S	S	S	UN	SE	UN		DO	SI	Zn		5d	4a	5d		FISH CONSUMPTION	55.8	0
Black Fork	11110105	-025	8.0		U															3				AQUATIC LIFE	34.4	21.4
Poteau River	11110105	-027	16.0	USGS	M	S	S	S	S	S	S									1				PRIMARY CONTACT	55.8	0
Hawes Creek	11110105	-026	11.6		U															3				SECONDARY CONTACT	55.8	0
Jones Creek	11110105	-028	4.0		U															3				DRINKING SUPPLY	49.2	6.6
Jones Creek	11110105	-029	11.6		U															3				AGRI & INDUSTRY	49.2	6.6
Ross Creek	11110105	-030	14.3		U															3						
Poteau River	11110105	-931	12.8	ARK0054	M	S	N	S	S	S	S	SE				SI				5d						
Poteau River	11110105	-031	6.6	ARK0055	M	S	N	S	S	N	N	MP/IP				CL	SO4	TDS	1	5e	5e	5e	4a			
James Fork	11110105	-033	18.4	ARK0015	M	S	S	S	S	S	S									1						
TOTAL MILES	105.3															1 = CU, Zn, & TP										
MILES UNASSESSED	49.5																									
MILES EVALUATED	0.0																									
MILES MONITORED	55.8																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0014	Poteau River near Fort Smith		1	A
ARK0054	Poteau River above Waldron	Y	1	A
ARK0055	Poteau River below Waldron	Y	1	A
ARK0015	James Fork near Hacket	Y	1	A

Table A-40: Segment 3I Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0035769	WALDRON, CITY OF	TRIB,POTEAU RV,ARKANSAS RV	11110105	031	1
AR0036293	MANSFIELD, CITY OF	COOP CK,CHEROKEE CK,PRAIRIE CK	11110105	033	2
AR0037419	HUNTINGTON, CITY OF	CHEROKEE CK,PRAIRIE CK,JAMES FRK RV	11110105	033	3
AR0038482	TYSON FOODS INC-WALDRON PROCES	TRIB,POTEAU RV,ARKANSAS RV	11110105	031	4
AR0039781	HACKETT, CITY OF	BIG BR HACKETT CK,JAMES FK,POTEAU R	11110105	033	5
AR0041165	SEBASTIAN LAKE WATER & SEWER	TRIB,HACKETT CK,JAMES FORK CK	11110105	033	6
AR0044679	HARTFORD SCHOOL DIST	TRIB,WEST CK	11110105	033	7
AR0048232	TRAVIS LUMBER COMPANY, INC	TRIB,COOP CK,CHEROKEE CK,PRAIRIE CK	11110105	033	8
AR0050431	SOUTHERN HILLS LLC-BLACK STONE	CEDAR CK,POTEAU RV,ARKANSAS RV	11110105		9

SEGMENT 3J GRAND NEOSHO BASIN

Segment 3J occupies the northwestern corner of Arkansas and covers most of Benton County and a large part of Washington County. This segment includes the Illinois River and its tributaries within Arkansas. The main tributaries are Osage Creek, Spavinaw Creek, Little Sugar Creek, Flint Creek, and Spring Creek.

Summary of Water Quality Conditions

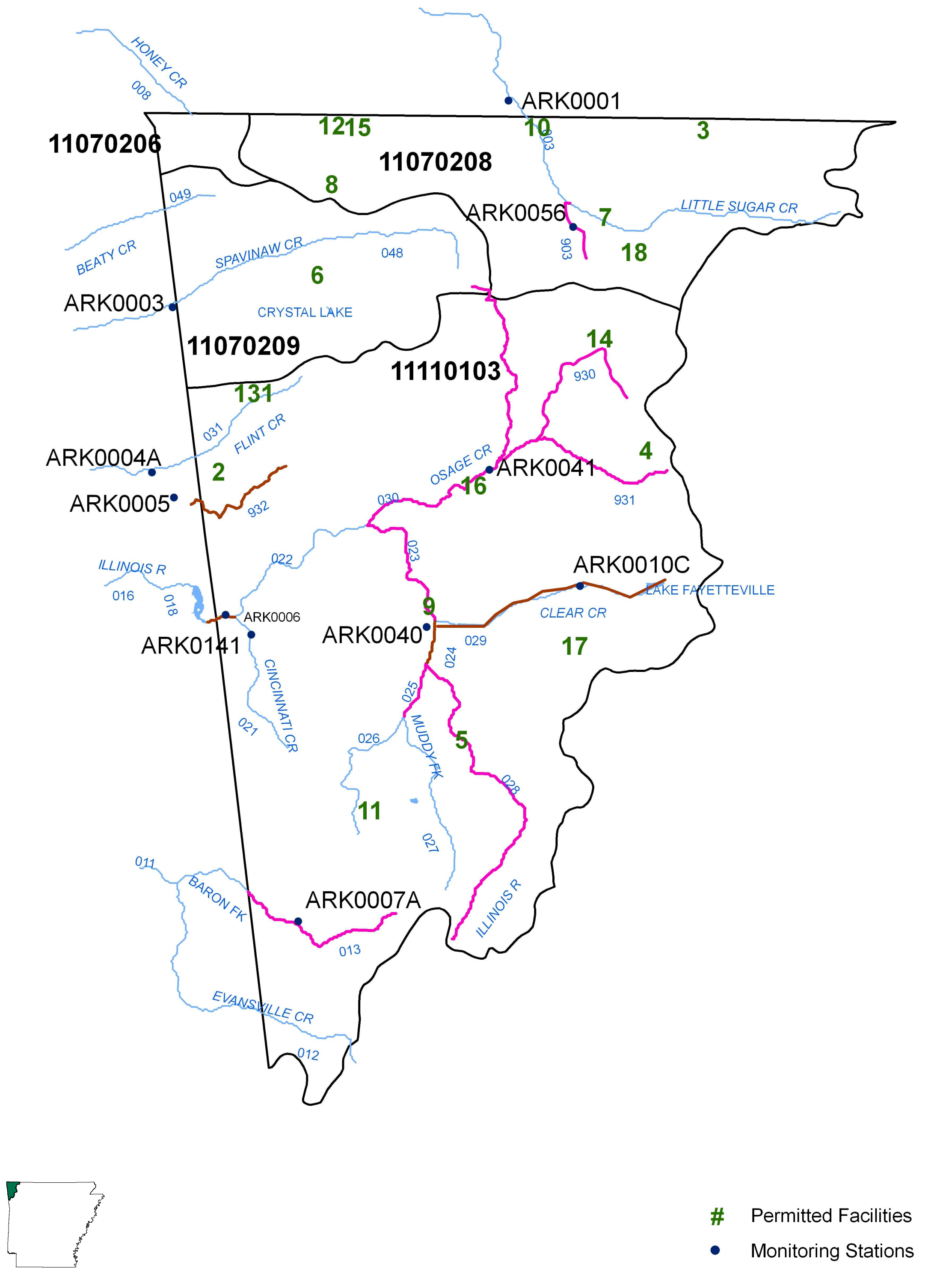
The waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. This segment contains 211.3 stream miles. Eleven permanent monitoring stations and several temporary stations in this planning segment were utilized to monitor 179.2 stream miles. An additional 17.9 stream miles were evaluated.

Nonpoint source impacts affecting waters in this segment are primarily from urban development, and pasture land which generally receives applications of poultry waste products. In addition, in stream gravel removal destabilizes the streambed, causing excessive bank erosion. Road construction and maintenance is also contributing to siltation problems. Three major municipal, point source discharges enter the Illinois River via Osage Creek and Clear Creek, and a minor municipal discharge enters the Illinois River from Muddy Fork of the Illinois River.

Several of the waste treatment facilities in Segment 3J have upgraded their facilities for advanced phosphorus removal. Analysis of phosphorus data over the past 10 years indicates a significant decrease trend in phosphorus concentrations in the Illinois River near Siloam Springs (Figure A-29), Sager Creek near Siloam Springs (Figure A-30), and Little Sugar Creek near Bentonville (Figure A-31).

A municipal point source discharge is impairing the aquatic life use in Town Branch Creek from excessive nutrient discharges. In addition, the drinking water use was listed as impaired in Sager Creek because of the municipal point source discharge. Both of these issues will be addressed through the NPDES program.

Figure A-28: Planning Segment 3J



(Segment 3J)

Table A-41: Planning Segment 3J—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4
SEG-3J																							
Evansville Cr.	11110103	-012	9.0		U															3			
Baron Fork	11110103	-013	10.0	ARK0007A+	M	S	S	N	S	S	S	UN				PA				5g			
Illinois River	11110103	-020	1.6	ARK0006	M	S	N	S	S	S	S	SE				SI				5d			
Cincinnati Cr.	11110103	-021	9.0	ARK0141	M	S	S	S	S	S	S									1			
Illinois River	11110103	-022	10.8	ARK0006A	M	S	S	S	S	S	S									1			
Illinois River	11110103	-023	8.1	ILL04	M	S	S	N	S	S	S	UN				PA				5g			
Illinois River	11110103	-024	2.5	ARK0040	M	S	N	N	S	S	S	SE	UN			SI	PA			5d	5g		
Muddy Fork.	11110103	-025	3.2	MFI04+	M	S	N	N	S	S	S	UN	UN			PA	TP			5g	5g		
Moores Creek	11110103	-026	9.8		E	S	S	S	S	S	S									1			
Muddy Fork	11110103	-027	11.0	MFI02B+	M	S	S	S	S	S	S									1			
Illinois River	11110103	-028	19.9	ILL01	M	S	S	N	S	S	S	UN				PA				5g			
Clear Creek	11110103	-029	13.5	ARK0010C	M	S	S	N	S	S	S	UR				PA				5d			
Osage Creek	11110103	-030	15.0	ARK0041	M	S	N	N	S	S	S	UN	UN			PA	TP			5g	5g		
Osage Creek	11110103	-930	10.2	OSC03+	M	S	N	S	S	S	S	UN				TP				5g			
L. Osage Creek	11110103	-933	11.9	ARK0155	M	S	S	N	S	S	S	UN				PA				5g			
Spring Creek	11110103	-931	8.4	SPG03+	M	S	N	N	S	S	S	UN	UN			PA	TP			5g	5g		
Flint Creek	11110103	-031	9.6	ARK0004A	M	S	S	S	S	S	S									1			
Sager Creek	11110103	-932	8.0	ARK0005	M	S	S	S	S	N	S	MP				NO3				5e			
Spavinaw Cr.	11070209	-048	19.3	ARK0003	M	S	S	S	S	S	S									1			
Beaty Creek	11070209	-049	5.2		U															3			
Little Sugar	11070208	-003	24.2	ARK0001	M	S	S	S	S	S	S									1			
Town Branch	11070208	-903	3.0	ARK0056	M	S	N	S	S	S	S	UN				TP				5g			
TOTAL MILES	223.2																						
MILES UNASSESSED	14.2																						
MILES EVALUATED	9.8																						
MILES MONITORED	199.2																						

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	209	0
AQUATIC LIFE	165.1	43.9
PRIMARY CONTACT	116.5	92.5
SECONDARY CONTACT	209	0
DRINKING SUPPLY	201	8
AGRI & INDUSTRY	209	0

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
ARK0007A	Barren Fork at county road 11 near Dutch Mills	Y	1	A
ARK0007	Barren Fork at Highway 59 near Dutch Mills		2	A
ARK0006	Illinois River at Highway 59	Y	1	A
ARK0141	Cincinnati Creek at Highway 244		1	A
ARK0006A	Illinois River south of Siloam Springs		2	A
ARK0040	Illinois River near Savoy	Y	1	A
MFI04+	Muddy Fork Illinois River at Highway 156 north of Viney Grove		2	S
MFI02B+	Muddy Fork Illinois River on county road west of Viney Grove		2	S
ILL01	Illinois River east of Highway 156 north of Viney Grove		2	S
ARK0010C	Clear Creek below Fayetteville		1	A
ARK0041	Osage Creek near Elm Springs	Y	1	A
OSC03+	Osage Creek off of Highway 112 south of Cave Springs near Elm Springs		2	S
SPG03+	Spring Creek Highway 112 south of Cave Springs		2	S
ARK0004A	Flint Creek near Siloam Springs	Y	1	A
ARK0005	Sager Creek near Siloam Springs		1	A
ARK0003	Spavinaw Creek north of Cherokee	Y	1	A
ARK0001	Little Sugar Creek near Bella Vista		1	A
ARK0056	Town Branch below Bentonville		1	A

Table A-42: Segment 3J Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0020184	GENTRY, CITY OF	ASH POND,SWEPCO RSRV,LTL FLINT CK	11110103	031	1
AR0020273	SILOAM SPRINGS, CITY OF	SAGER CK,FLINT CK,ILLINOIS RV	11110103	932	2
AR0020672	PEA RIDGE, CITY OF	OTTER CK,BIG SUGAR CK,ELK RV,NEOSHO	11070208		3
AR0022063	SPRINGDALE, CITY OF	SPRING CK,OSAGE CK,ILLINOIS RV	11110103	931	4
AR0022098	PRAIRIE GROVE, CITY OF	MUDDY FRK/ILLINOIS RV	11110103	027	5
AR0022292	DECATUR, CITY OF	COLUMBIA HOLLOW CK,SPAVINAW CK	11070209	048	6
AR0022403	BENTONVILLE, CITY OF	TOWN BR,LTL SUGAR CK	11070208	903	7
AR0023833	GRAVETTE, CITY OF	RR HOLLOW,SPAVINAW CK,GRAND NEOSHO	11070209	048	8
AR0033910	USDAFS-LAKE WEDINGTON REC AREA	ILLINOIS RV TRIB	11110103	023	9
AR0034258	VILLAGE WASTEWATER COMPANY,INC	LTL SUGAR CK,ARKANSAS RV	11070208	003	10
AR0035246	LINCOLN, CITY OF	TRIB,BUSH CK,BARON FORK CK,ILLINOIS	11110103	026	11
AR0036480	SULPHUR SPRINGS, CITY OF	BUTLER CK	11070208		12
AR0037842	AEP-SWEPCO FLINT CREEK POWER P	SWEPCO RSRVR,LT FLINT CK,FLINT CK	11110103	031	13
AR0043397	ROGERS, CITY OF	1-OSAGE CK,IL RV; 2-PINNACLE GOLF	11110103	930	14
AR0046639	BENTON COUNTY STONE CO, INC	TRIB,BUTLER CK,ELK RV	11070208		15
AR0050024	NORTHWEST AR CONSERVATION AUTH	OSAGE CK,ILLINOIS RV	11110103	003	16
AR0050288	FAYETTEVILLE/WEST SIDE WWTP	GOOSE CK,ILLINOIS RV,ARKANSAS RV	11110103		17
AR0050652	WAL-MART DGTC/ISD #9280	TRIB,OSAGE CK,ILLINOIS RV,ARKANSAS	11110103		18

Figure A-29: Illinois River (ARK0006) Total Phosphorus 10-Year Trend

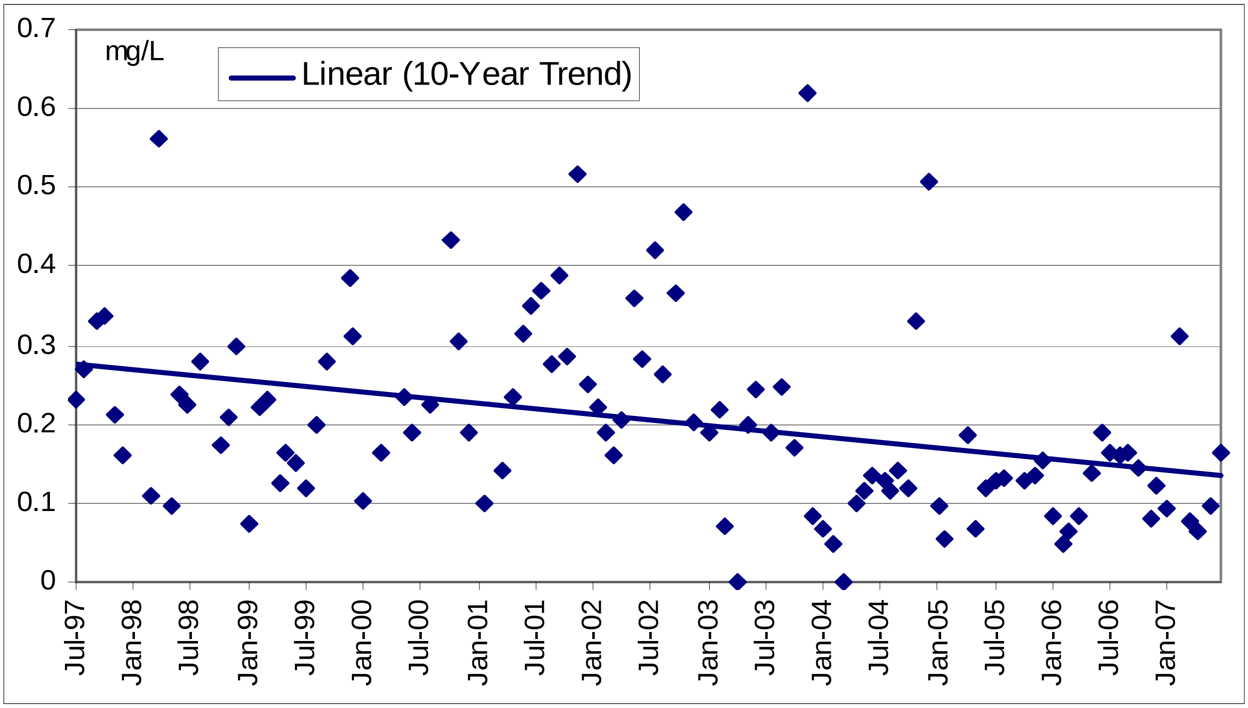


Figure A-30: Osage Creek (ARK0041) Total Phosphorus 10-Year Trend

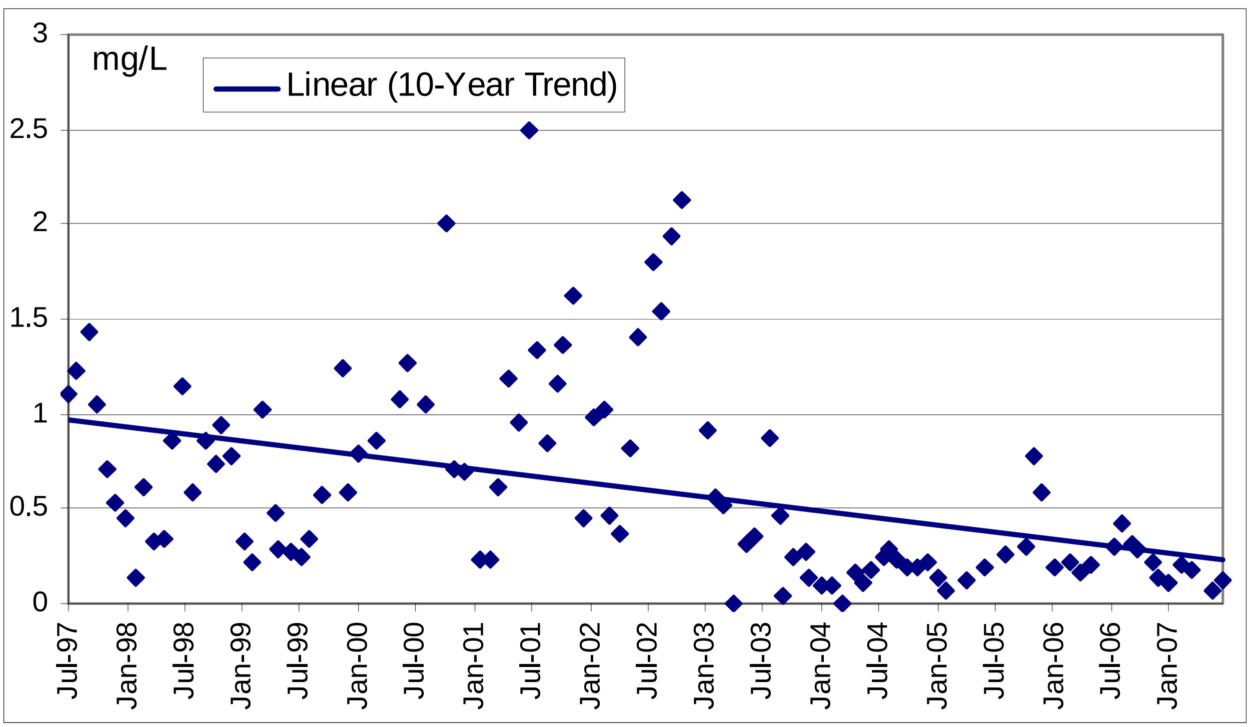
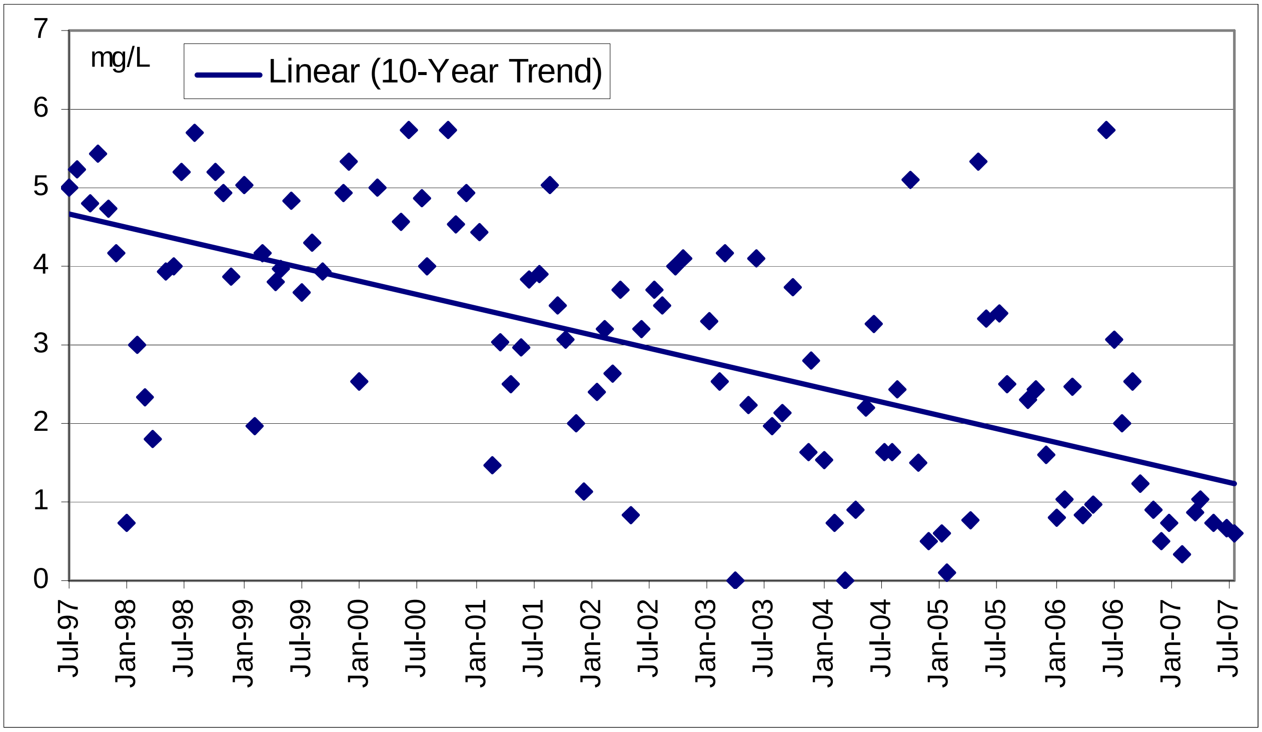


Figure A-31: Little Sugar Creek (ARK0056) Total Phosphorus 10-Year Trend



SEGMENT 4A LOWER WHITE RIVER AND TRIBUTARIES

Segment 4A, located on the east central edge of Arkansas, includes most of the drainage from Monroe and Phillips Counties. It also drains portions of Arkansas, Prairie, Woodruff, St. Francis, Lee, and Desha Counties. This segment is drained by the lower 133-mile reach of the White River from Wattensaw Bayou to its mouth. Principal tributaries include Big Creek, La Grue Bayou, Lick Creek, and Cypress Bayou.

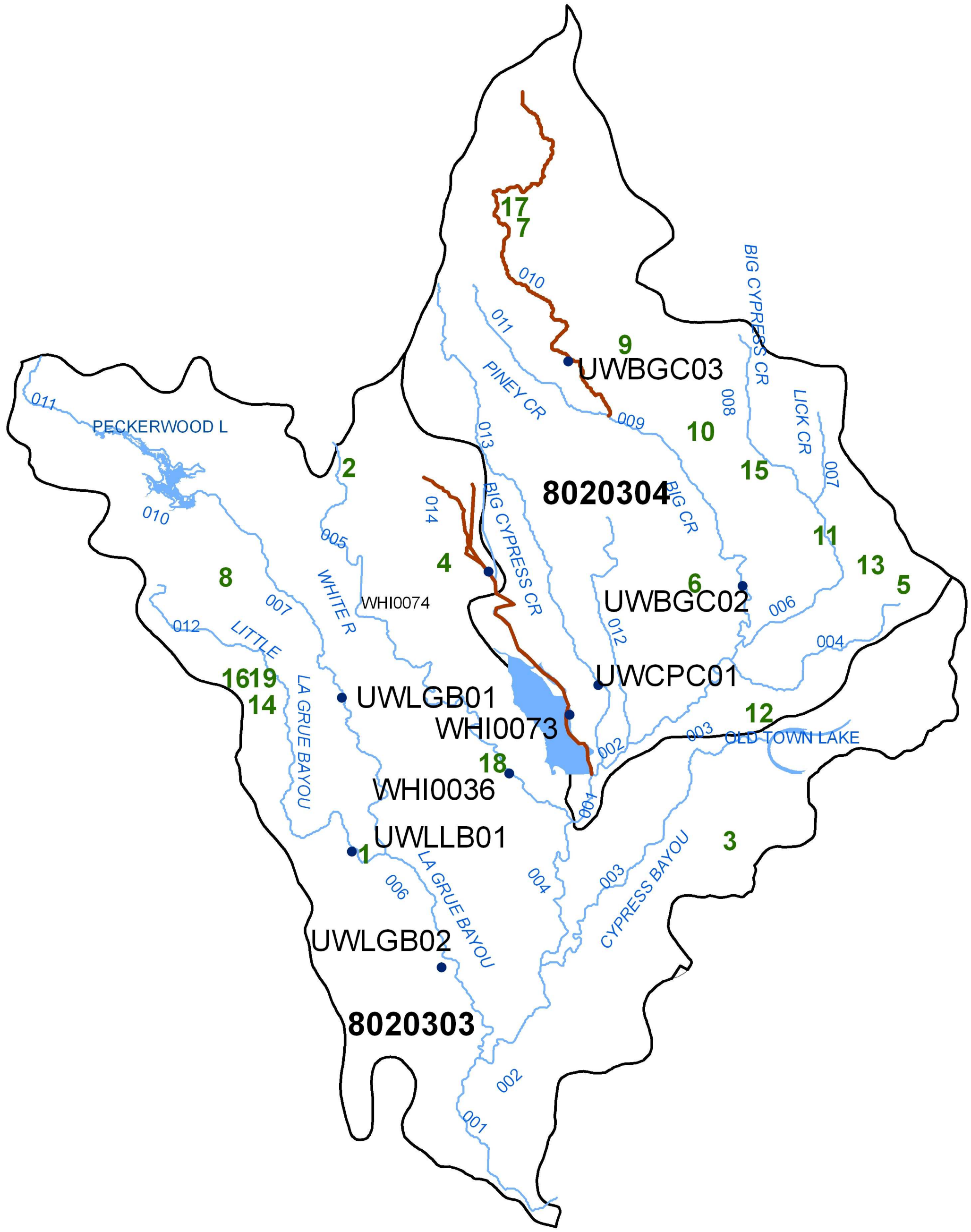
Summary of Water Quality Conditions

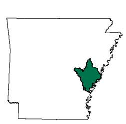
All waters within this segment have been designated for propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supply. None are designated as outstanding state or national resource waters. Monitoring stations within the segment allowed the assessment of 283.6 miles; an additional 120.3 miles were evaluated.

A segment of Big Creek was listed as not supporting the agriculture and industrial water supply use because of excessive chlorides and total dissolved solids concentrations. The source is suspected to be from row crop agriculture activities.

Prairie Cypress Creek and Boat Gunwale Slash were both listed in Category 5f because of low dissolved oxygen concentrations. This is a naturally occurring problem throughout the Delta ecoregion during the critical season when flows are diminished and water temperatures are elevated. This issue will need to be addressed either through a standards change or an assessment methodology change.

Figure A-32: Planning Segment 4A





(Segment 4A)

Table A-43: Planning Segment 4A—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-4A																										
White River	8020303	-001	16.2		E	S	S	S	S	S	S									1				FISH CONSUMPTION	403.9	0
White River	8020303	-002	11.3		E	S	S	S	S	S	S									1				AQUATIC LIFE	372.8	31.1
Cypress Bayou	8020303	-003	30.0		U															1				PRIMARY CONTACT	403.9	0
White River	8020303	-004	14.8		E	S	S	S	S	S	S									1				SECONDARY CONTACT	403.9	0
White River	8020303	-005	46.6	WHI0036	M	S	S	S	S	S	S									1				DRINKING SUPPLY	403.9	0
La Grue Bayou	8020303	-006	20.1	UWLGB02	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	369.6	34.3
La Grue Bayou	8020303	-007	36.1	UWLGB01	M	S	S	S	S	S	S									1						
La Grue Bayou	8020303	-011	11.7		U															3						
L.La Grue Bayou	8020303	-012	37.0	UWLLB01	M	S	S	S	S	S	S									1						
Big Creek	8020304	-001	4.1		E	S	S	S	S	S	S									1						
Big Creek	8020304	-002	2.7		E	S	S	S	S	S	S									1						
Big Creek	8020304	-003	12.4	WHI0037	M	S	S	S	S	S	S									1						
Beaver Bayou	8020304	-004	17.4		E	S	S	S	S	S	S									1						
Big Creek	8020304	-005	1.7		E	S	S	S	S	S	S									1						
Lick Creek	8020304	-006	15.5		E	S	S	S	S	S	S									1						
Lick Creek	8020304	-007	6.8		E	S	S	S	S	S	S									1						
Big Cypress Cr.	8020304	-008	14.9		E	S	S	S	S	S	S									1						
Big Creek	8020304	-009	25.2	UWBGC02	M	S	S	S	S	S	S									1						
Big Creek	8020304	-010	34.3	UWBGC03	M	S	S	S	S	S	N	AG	AG			CL	TDS			5d	5d					
Piney Creek	8020304	-011	14.9		E	S	S	S	S	S	S									1						
Little Cypress	8020304	-012	19.3		U															3						
Big Cypress Cr.	8020304	-013	40.8	UWCPC01	M	S	S	S	S	S	S									1						
Prairie Cypress	8020304	-014	26.1	WHI0073	M	S	N	S	S	S	S	UN				DO				5f						
Big Creek	8020304	-015	1.2		U															3						
Boat Gunwale Slash	8020304	-914	5.0	WHI0074	M	S	N	S	S	S	S	UN				DO				5f						
TOTAL MILES	466.1																									
MILES UNASSESSED	62.2																									
MILES EVALUATED	120.3																									
MILES MONITORED	283.6																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0036	White River at Highway 1 near St. Charles	Y	1	A
UWLGB02	LaGrue Bayou at Highway 17 at LaGrue Springs		2	R
UWLGB01	LaGrue Bayou at Highway 33 near LaGrue		2	R
UWLLB01	Little LaGrue Bayou at Highway 1 near Dewitt		2	R
WHI0037	Big Creek at Highway 318 near Watkins Corner		2	R
UWBGC02	Big Creek at Highway 49 near Poplar Bluff		2	R
UWBGC03	Big Creek at Highway 79, 3 miles west of Moro		2	R
UWCPC01	Big Cypress Creek at Highway 1, 4 miles northeast of Cross Roads		2	R
WHI0073	Prairie Cypress Creek at Highway 1 near Cross Roads		1	A
WHI0074	Boat Gunwale Slash at Highway 146 near Holly Grove		1	A

Table A-44: Segment 4A Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021431	DEWITT, CITY OF	LAGRUE BU,WHITE RV	08020303	012	1
AR0021644	CLARENDON, CITY OF	WHITE RV	08020303	005	2
AR0022420	ELAINE, CITY OF	GOVAN SLU,GAUZLEY BU,CYPRESS BU	08020303	003	3
AR0022438	HOLLY GROVE, CITY OF	DIAL CK,CUT BLUFF SLU,WHITE RV	08020303	005	4
AR0022756	HELENA INDUSTRIES, INC.	DIT,LICK CK,WHITE RV	08020304	004	5
AR0035840	MARVELL, CITY OF	BIG CK,WHITE RV	08020304	009	6
AR0036315	WHEATLEY, CITY OF	FLAT FORK CK,BIG CK,WHITE RV	08020304	010	7
AR0038008	ULM, CITY OF	TRIB,SHERRIL CK,LAGRUE BU	08020303	007	8
AR0038237	MORO, CITY OF	HOG TUSK CK,BIG CK	08020304	010	9
AR0038784	AUBREY, CITY OF	TRIB,CAT CK,SPRING CK,WHITE RV	08020304	009	10
AR0041092	LEXA, CITY OF	LICK CK,BIG CK,WHITE RV	08020304	006	11
AR0041327	LAKE VIEW, CITY OF	JOHNSON BU,BIG CK,WHITE RV	08020304	003	12
AR0042404	SOUTHLAND IMPROVEMENT DISTRICT	CROOKED CK,LICK CK,BIG CK,WHITE RV	08020304	006	13
AR0044415	U OF A RICE RESEARCH & EXTENSI	LTL LAGRUE BU,WHITE RV	08020303	012	14
AR0045373	RONDO, CITY OF	TRIB,BIG CYPRESS CK,LICK CK,WHITE R	08020304	008	15
AR0046469	MONSANTO AG RESEARCH	WILDCAT DIT TRIB,LT LAGRUE BU	08020303	012	16
AR0046752	MAPCO EXPRESS, INC-3154 WHEATL	TRIB,FLAT FORK CK, FLAT FORK LITTLE RIVER, BIG CR, WHITE R	08020304	010	17
AR0049310	ST CHARLES, CITY OF	WHITE RV	08020303	005	18
AR0049352	USDA-AQUACULTURE RESEARCH CENT	DITCH,LTL LAGRUE BU, WHITE RV	08020303	012	19

SEGMENT 4B BAYOU DEVIEW AND CACHE RIVER

Segment 4B, located in the northeastern part of Arkansas, is a long, narrow segment that includes parts of Greene, Craighead, Poinsett, Jackson, Woodruff, Monroe, Prairie, Lawrence, and Clay Counties. The segment includes Bayou DeView and Cache River and their major tributaries including Cow Ditch, Buffalo Creek, and Flag Slough.

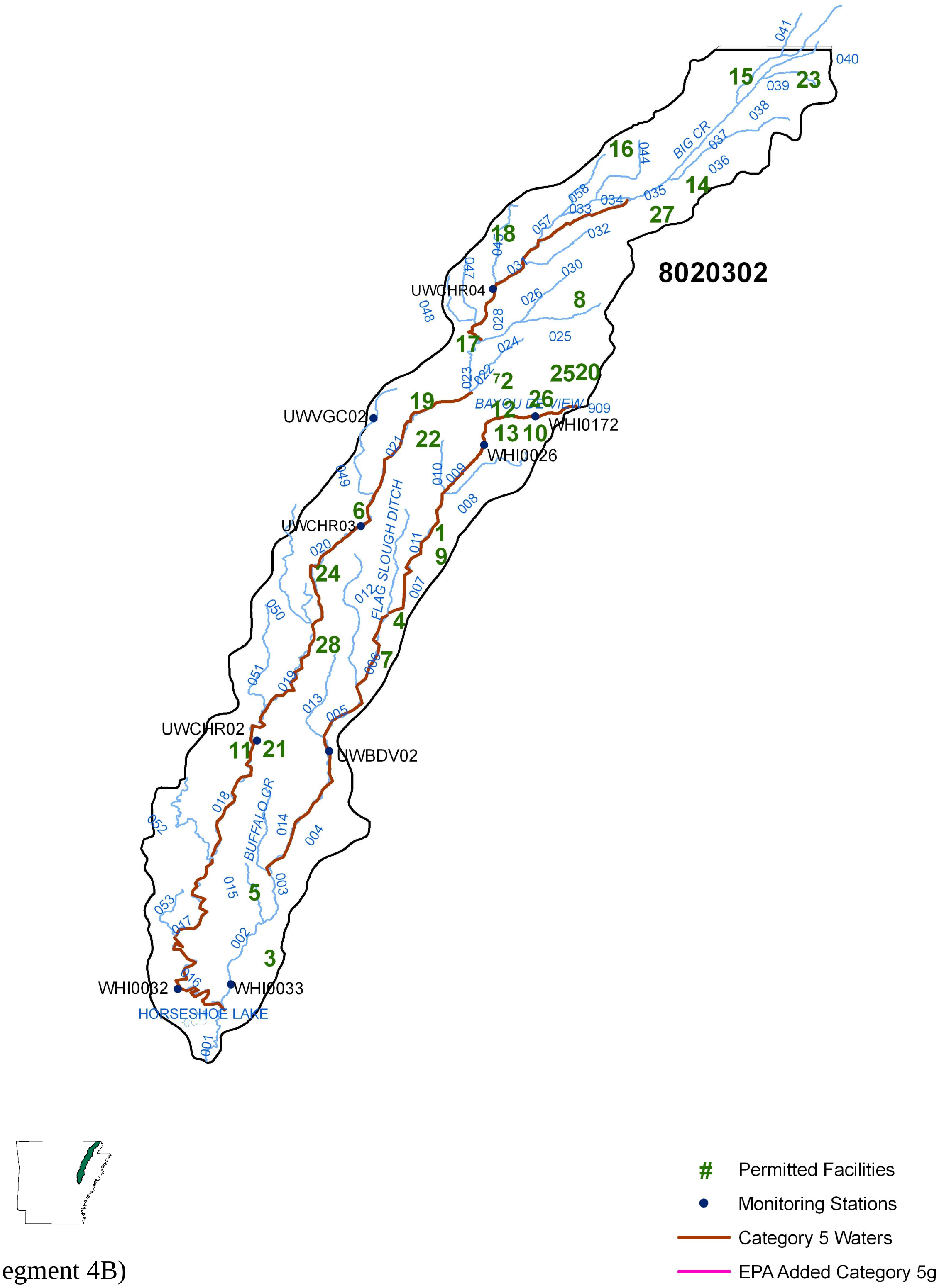
Summary of Water Quality Conditions

The 599.1 miles of streams in this segment are designated for propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies. None of these are designated as outstanding state or national resource waters. Water sampling stations allowed for the monitoring of 129.8 stream miles in this segment. An additional 114.6 miles of this stream were evaluated.

The upper section of Bayou DeView and Lost Creek Ditch are not meeting the aquatic life use because of toxic metals (aluminum, beryllium, copper, lead, and zinc). In addition, elevated levels of chlorides and total dissolved solids are also listed as causes. Potential sources include an industrial point source discharge and row crop agriculture activities.

Several segments of the Cache River and Bayou DeView have been listed because of lead contamination. It is thought that most of the elevated metals detections are associated with the large winter and spring storm events that carry large amounts of clay particles into the River. Additional investigation is needed to more accurately assess this problem.

Figure A-33: Planning Segment 4B



(Segment 4B)

Table A-45: Planning Segment 4B—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4
SEG-4B																							
Cache River	8020302	-001	8.6		E	S	S	S	S	S	S									1			
Bayou DeView	8020302	-002	13.7	WHI0033	M	S	S	S	S	S	S									1			
Bayou DeView	8020302	-003	7.1		E	S	S	S	S	S	S									1			
Bayou DeView	8020302	-004	21.2	UWBDV02	M	S	N	S	S	S	S	AG				Pb				5d			
Bayou DeView	8020302	-005	8.6		E	S	N	S	S	S	S	AG				Pb				5d			
Bayou DeView	8020302	-006	10.2		E	S	N	S	S	S	S	AG				Pb				5d			
Bayou DeView	8020302	-007	18.2		E	S	N	S	S	S	S	AG				Pb				5d			
Lost Creek Ditch[1]	8020302	-909	7.9	WHI0172	M	S	N	S	S	N	N	IP	IP			CL	Be			5d	5d		
Bayou DeView[2]	8020302	-009	11.7	WHI0026	M	S	N	S	S	S	N	AG	MP	MP		TDS	CL	AL		5a	5a	5a	
Black Creek	8020302	-008	13.0		U															3			
Johnson Ditch	8020302	-010	6.5		U															3			
Flag Slough	8020302	-011	14.7		U															3			
Cow Ditch	8020302	-012	19.2		U															3			
May Br. Lateral	8020302	-013	12.6		U															3			
Buffalo Creek	8020302	-014	13.1		U															3			
Gum Flat	8020302	-015	8.8		U															3			
Cache River	8020302	-016	21.8	WHI0032	M	S	N	S	S	S	S	AG				Pb				5d			
Cache River	8020302	-017	15.8		E	S	N	S	S	S	S	AG				Pb				5d			
Cache River	8020302	-018	25.0	UWCHR02	M	S	N	S	S	S	S	AG				Pb				5d			
Cache River	8020302	-019	13.7		E	S	N	S	S	S	S	AG				Pb				5d			
Cache River	8020302	-020	22.6	UWCHR03	M	S	N	S	S	S	S	AG				Pb				5d			
Cache River	8020302	-021	18.4		E	S	N	S	S	S	S	AG				Pb				5d			
Gum Slough	8020302	-022	9.5		U															3			
Cache River	8020302	-023	7.9		U															3			
Ditch 26	8020302	-024	5.4		U															3			
Poplar Creek	8020302	-025	9.2		U															3			
Ditch 26	8020302	-026	7.8		U															3			
Cache River	8020302	-027	3.9		E	S	N	S	S	S	N	AG	AG	AG		Pb	TDS	SI		5d	4a		
Cache River	8020302	-028	5.9	UWCHR04	M	S	N	N	S	S	N	AG	AG	AG	UN	Pb	TDS	SI	PA	5d	4a	4a	5g
Cache River	8020302	-029	3.9		E	S	N	S	S	S	N	AG	AG	AG		Pb	TDS	SI		5d	4a		
Swan Ditch	8020302	-030	9.1		U															3			
Cache River	8020302	-031	3.4		E	S	N	S	S	S	N	AG	AG	AG		Pb	TDS	SI		5d	4a		
Cache River	8020302	-032	11.4		E	S	N	S	S	S	N	AG	AG	AG		Pb	TDS	SI		5d	4a		
Cache River	8020302	-033	4.3		U															3			
Cache River	8020302	-034	3.7		U															3			
Cache River	8020302	-035	4.6		U															3			
Big Creek	8020302	-036	16.2		U															3			
Cache River	8020302	-037	12.3		U															3			
Little Cache	8020302	-038	4.4		U															3			
Housman Creek	8020302	-039	6.7		U															3			
Little Cache	8020302	-040	8.1		U															3			
Cache River	8020302	-041	8.7		U															3			
Big Gum Lateral	8020302	-044	11.2		U															3			
Beaver Dam Cr.	8020302	-045	11.8		U															3			
Kello Ditch	8020302	-046	0.6		U															3			
Kello Ditch	8020302	-047	8.5		U															3			
Fry Ditch	8020302	-048	8.0		U															3			
Willow Ditch	8020302	-049	17.6		U															3			
Locust Creek	8020302	-050	18.8		U															3			
Overcup Creek	8020302	-051	15.7		U															3			
Cache Bayou	8020302	-052	18.7		U															3			
Hill Bayou	8020302	-053	8.1		U															3			
Locust Bayou	8020302	-055	0.4		U															3			
Cypress Creek	8020302	-056	6.5		U															3			
Cache River	8020302	-057	4.7		U															3			
Petersburg Ditch	8020302	-058	9.7		U															3			
TOTAL MILES	599.1																						
MILES UNASSESSED	346.1																						
MILES EVALUATED	123.2																						
MILES MONITORED	129.8																						

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	253	0
AQUATIC LIFE	29.4	223.6
PRIMARY CONTACT	247.1	5.9
SECONDARY CONTACT	253	0
DRINKING SUPPLY	245.1	7.9
AGRI & INDUSTRY	204.9	48.1

1 Reach formally -009U
2 Reach formally -009L

Table A-45(cont.): Planning Segment 4B—Designated Use Attainment Status and Water Quality Monitoring Stations

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0033	Bayou DeView at Highway 70 near Brinkley		2	R
UWBDV02	Bayou DeView at Highway 64 east of McCrory		2	R
WHI0172	Lost Creek Ditch at Lacy Drive near Jonesboro		1	A
WHI0026	Bayou DeView on Highway 226 west of Gibson	Y	1	A
WHI0032	Cache River at Highway 70 near Brinkley		2	R
UWCHR02	Cache River at Highway 64 at Peterson		2	R
UWCHR03	Cache River at Highway 18 near Gruggs		2	R
UWCHR04	Cache River at Highway 412 east of Walnut Ridge		2	R

Table A-46: Segment 4B Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0020354	WEINER, CITY OF	BU DEVIEW TRIB	08020302	007	1
AR0020699	BONO, CITY OF	TRIB/WHALEY SLU DIT,CACHE RV	08020302		2
AR0021890	BRINKLEY, CITY OF	CANEY SLASH,BU DEVIEW,WHITE RV	08020302	002	3
AR0022446	FISHER, CITY OF	BU DEVIEW TRIB,BU DEVIEW,WHITE RV	08020302	007	4
AR0033391	COTTON PLANT, CITY OF	TURKEY CK DIT,BU DEVIEW,CACHE RV	08020302	003	5
AR0034614	GRUBBS, CITY OF	CACHE RV,WHITE RV	08020302	020	6
AR0034720	HICKORY RIDGE, CITY OF	BU DEVIEW,CACHE RV,WHITE RV	08020302	006	7
AR0035947	AR PARKS & TOURISM-CROWLEY'S R	DIT,BIG DIT,CACHE,WHITE RV	08020302	026	8
AR0037834	RICELAND FOODS, INC-WALDENBURG	DIT,BU DEVIEW,WHITE RV	08020302	007	9
AR0037907	JONESBORO CITY WATER & LIGHT-W	TRIB,BIG CK,BU DEVIEW,CACHE RV	08020302	009U	10
AR0039837	PATTERSON, CITY OF	CACHE RV	08020302		11
AR0041629	WESTSIDE CONSOLIDATED SCHOOL D	TRIB,BIG CK DIT,BU DEVIEW,CACHE RV	08020302		12
AR0042188	NORTHERN MOBILE HOME PARK	TRIB,BIG CK,CACHE RV	08020302		13
AR0042552	TRI-COUNTY SAND & GRAVEL, INC	DORT CK,CACHE RV DIT #10,CACHE RV	08020302		14
AR0042781	MCDOUGAL, CITY OF	CACHE RIVER DIT,LTL CACHE RIVER DIT	08020302	041	15
AR0043290	KNOBEL, CITY OF	TRIB,CACHE RV,WHITE RV	08020302	044	16
AR0043443	SEDGWICK, CITY OF	W CACHE RV DIT,CACHE RV,WHITE RV	08020302	027	17
AR0043486	TRI-CITY UTILITIES, INC	TRIB,BEAVER DAM DIT	08020302	045	18
AR0043524	EGYPT, CITY OF	W CACHE RV DIT,CACHE RV,WHITE RV	08020302	021	19
AR0044211	OLIVETAN BENEDICTINE SISTERS	TRIB,LOST CK,BIG CK DIT	08020302		20
AR0044954	MCCRORY, CITY OF	CACHE RV,WHITE RV	08020302	018	21
AR0045284	CASH, CITY OF	TRIB,CACHE RV,WHITE RV	08020302	021	22
AR0045489	POLLARD SEWER SYSTEM	HORSE/POLLARD CK,DIT#2,DIT#1,CACHE RV,WHITE	08020302	039	23
AR0046604	AMAGON, CITY OF	CACHE RV TRIB,WHITE RV	08020302	020	24
AR0046981	HEDGER AGGREGATE, INC.	DIT,MUD CK,BIG CK DIT,BAYOU DEVIEW	08020302		25
AR0048402	LMJ TRAILER PARK	TRIB,BIG CREEK DIT,BU DEVIEW,CACHE	08020302		26
AR0048909	LAFE, CITY OF	BIG CK, CACHE RV, WHITE RV	08020302	036	27
AR0049603	BEEDEVILLE, CITY OF	CACHE RV,WHITE RV,ARKANSAS RV	08020302	019	28

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SEGMENT 4C VILLAGE CREEK AND TRIBUTARIES

Segment 4C includes portions of Randolph, Green, Lawrence, Jackson, Woodruff, and White Counties. This segment includes Village Creek and its tributaries, and a segment of the White River and its tributaries, Departee and Glaise Creeks.

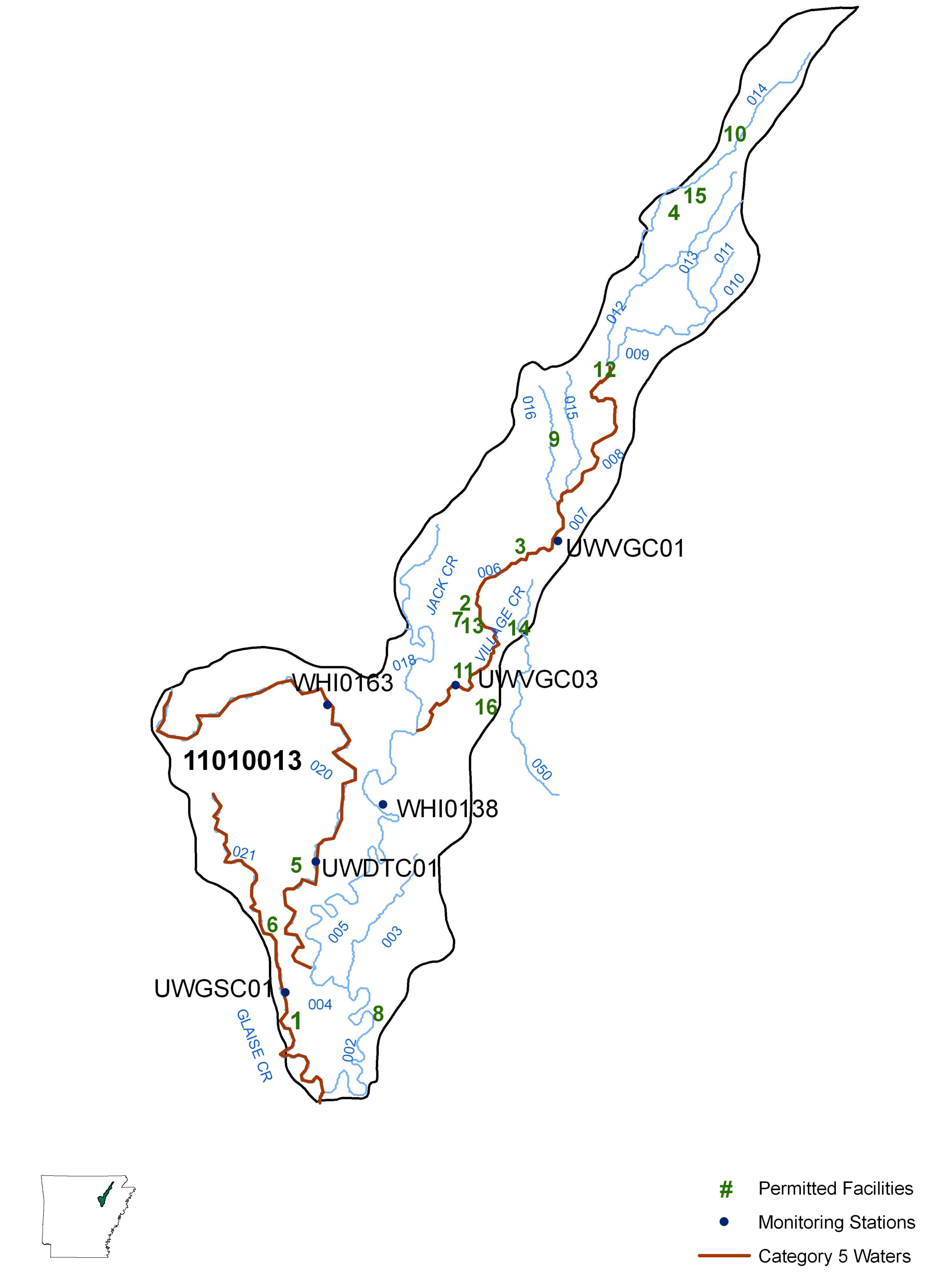
Summary of Water Quality Conditions

Propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supply are the designated uses for all waters within this segment. Assessment of designated use support was made on 208.5 miles of the total of 285 miles of stream within this segment.

Three segments of Village Creek were placed in Category 5f because of low dissolved oxygen concentrations. This is a naturally occurring problem throughout the Delta ecoregion during the critical season when flows are diminished and water temperatures are elevated. This issue will need to be addressed either through a standards change or an assessment methodology change.

One segment of Departee Creek and one segment of Glaise Creek were listed as not supporting the aquatic life use because of zinc toxicity. It is thought that most of the elevated metals detections are associated with the large winter and spring storm events that carry large amounts of clay particles into the streams. Additional investigation is needed to more accurately assess this problem.

Figure A-34: Planning Segment 4C



(Segment 4C)

Table A-47: Planning Segment 4C—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-4C																										
White River	11010013	-001	0.8		E	S	S	S	S	S	S									1				FISH CONSUMPTION	208.5	0
White River	11010013	-002	20.8		E	S	S	S	S	S	S									1				AQUATIC LIFE	92.9	115.6
Deep Slough	11010013	-003	12.7		U															3				PRIMARY CONTACT	165.4	43.1
White River	11010013	-004	4.4		E	S	S	S	S	S	S									1				SECONDARY CONTACT	208.5	0
White River	11010013	-005	36.7	WHI0138	M	S	S	S	S	S	S									1				DRINKING SUPPLY	208.5	0
Village Cr	11010013	-006	25.2	UWVGC01,3	M	S	N	S	S	S	S	UN				DO				5f				AGRI & INDUSTRY	208.5	0
Village Cr	11010013	-007	1.2		E	S	N	S	S	S	S	UN				DO				5f						
Village Cr	11010013	-008	13.0		E	S	N	N	S	S	S	UN	UN			DO	PA			5f	5g					
Lick Pond Slough	11010013	-009	10.9		U															3						
Lick Pond Slough	11010013	-011	10.4		U															3						
Village Cr	11010013	-012	7.4	UWVGC02	M	S	S	S	S	S	S									1						
Village Cr	11010013	-014	22.8		E	S	S	S	S	S	S									1						
Maple Ditch	11010013	-015	9.5		U															3						
Cattail Cr	11010013	-016	9.3		U															3						
White River	11010013	-017	13.7		U															3						
Jack Creek	11010013	-018	9.6		U															3						
White River	11010013	-019	0.4		U															3						
Departee Creek	11010013	-020	46.1	UWDTC01	M	S	N	S	S	S	S	AG				Zn				5d						
Glaise Creek	11010013	-021	30.1	UWGSC01	M	S	N	N	S	S	S	AG	UN			Zn	PA			5d	5g					
TOTAL MILES	285.0																									
MILES UNASSESSED	76.5																									
MILES EVALUATED	63.0																									
MILES MONITORED	145.5																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0138	White River at Highway 67 near Newport	Y	1	A
UWVGC01	Village Creek at Highway 37 near Tuckerman		2	R
UWVGC03	Village Creek at Highway 24 near Newport		2	R
UWVGC02	Village Creek at Highway 228 near Miniturn		2	R
UWDTC01	Departee Creek east of Bradford		2	R
UWGSG01	Glaise Creek at Highway 64 east of Bald Knob		2	R

Table A-48: Segment 4C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000400	ARKANSAS ELECTRIC COOP-CARL E.	WHITE RV (001) & OLD CANEY CK (002)	11010013	002	1
AR0001481	NORANDAL USA, INC	DIT,VILLAGE CK,WHITE RV	11010013	006	2
AR0020001	TUCKERMAN, CITY OF	TUCKERMAN DITCH CK,VILLAGE CK	11010013	006	3
AR0020141	HOXIE, CITY OF	TRIB,TURKEY CK,VILLAGE CK	11010013	014	4
AR0022136	BRADFORD, CITY OF	BUTTER CK,DEPARTEE CK,WHITE RV	11010013	020	5
AR0022217	RUSSELL, CITY OF	GLAISE CK,WHITE RV	11010013	021	6
AR0034550	ARKANSAS STEEL ASSOC	TRIB,VILLAGE CK,WHITE RV	11010013	006	7
AR0034738	AUGUSTA, CITY OF	WHITE RV	11010013	002	8
AR0034860	SWIFTON, CITY OF	CATTAIL CK,VILLAGE CK,WHITE RV	11010013	016	9
AR0036668	FRIT INDUSTRIES, INC	TRIB,COON CK,VILLAGE CK,WHITE RV	11010013	014	10
AR0037044	NEWPORT, CITY OF-WASTEWATER TR	DIT,VILLAGE CK,WHITE RV	11010013	006	11
AR0039675	ALICIA, CITY OF	BLACK SPICE DIT,VILLAGE CK, WHITE	11010013	008	12
AR0041033	DIAZ, CITY OF	TRIB,VILLAGE CK,WHITE RV	11010013	006	13
AR0045225	NEWPORT, CITY OF-AIRPORT/INDUS	TRIB,LOCUST CK,VILLAGE CK,WHITE RV	11010013	014	14
AR0046566	WALNUT RIDGE, CITY OF	VILLAGE CK,WHITE RV	11010013	006	15
AR0049441	JORDAN'S #5	TRIB,MAYBERRY SLU,MILL CK,WHITE RV	11010013	017	16

SEGMENT 4D WHITE RIVER, WATTENSAW BAYOU, AND BAYOU DES ARC

Segment 4D includes portions of White, Prairie, Faulkner, Pulaski, Lonoke, and Monroe Counties in central Arkansas. The segment encompasses a 67-mile stretch of the White River, and its tributaries; Wattensaw and Des Arc Bayous.

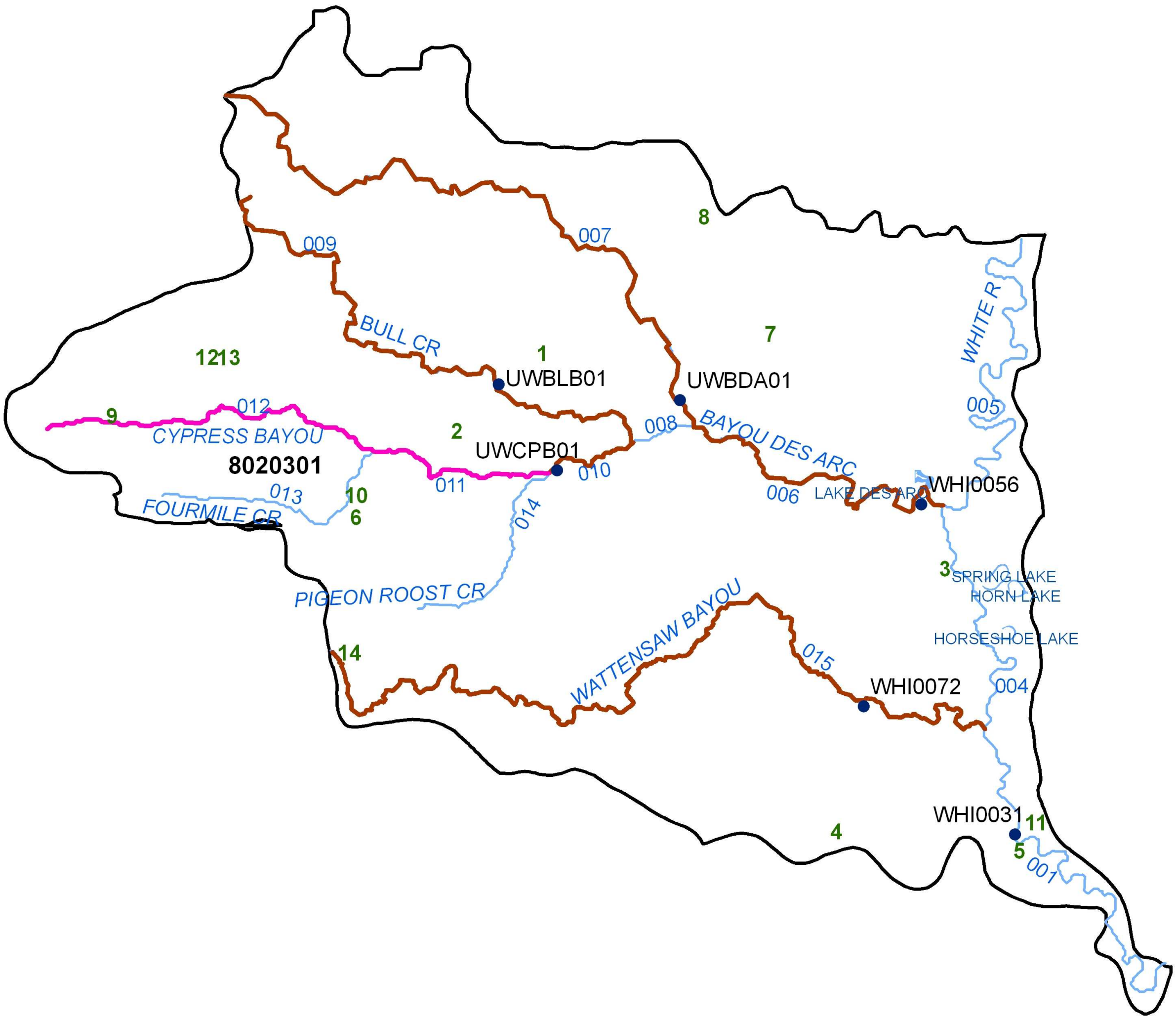
Summary of Water Quality Conditions

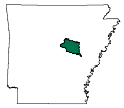
The designated uses for all waters within this segment include propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supply. No outstanding state or national resource waters are located in this segment. Monitoring stations provided data to assess 160.7 miles of streams. An additional 43 miles were evaluated.

Two stream segments on Bayou Des Arc and one segment each on Bull Bayou and Cypress Bayou were listed as not supporting the aquatic life use because of metals toxicity. It is thought that most of the elevated metals detections are associated with the large winter and spring storm events that carry large amounts of clay particles into the Bayous. Additional investigation is needed to more accurately assess this problem.

Wattensaw Bayou was placed in Category 5f because of low dissolved oxygen concentrations. This is a naturally occurring problem throughout the Delta ecoregion during the critical season when flows are diminished and water temperatures are elevated. This issue will need to be addressed either through a standards change or an assessment methodology change.

Figure A-35: Planning Segment 4D





(Segment 4D)

Permitted Facilities

● Monitoring Stations

Category 5 Waters

EPA Added Category 5g

Table A-49: Planning Segment 4D—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-4D																										
White River	8020301	-001	24.3	WHI0031	M	S	S	S	S	S	S									1				FISH CONSUMPTION	203.7	0
White River	8020301	-004	14.8		E	S	S	S	S	S	S									1				AQUATIC LIFE	67.3	136.4
White River	8020301	-005	28.2		E	S	S	S	S	S	S									1				PRIMARY CONTACT	169.7	61
Bayou Des Arc	8020301	-006	17.8	WHI0056	M	S	N	S	S	S	S	AG				Zn				5d				SECONDARY CONTACT	203.7	0
Bayou Des Arc	8020301	-007	36.4	UWBDA01	M	S	N	S	S	S	S	AG				Zn				5d				DRINKING SUPPLY	203.7	0
Cypress Bayou	8020301	-008	3.2		U															3				AGRI & INDUSTRY	203.7	0
Bull Bayou	8020301	-009	29.0	UWBLB01	M	S	N	N	S	S	S	AG	PA			Zn	UN			5d	5g					
Cypress Bayou	8020301	-010	5.0	UWCPB01	M	S	N	N	S	S	S	AG	PA			Pb	UN			5d	5g					
Cypress Bayou	8020301	-011	9.5					N					PA				UN				5g					
Cypress Bayou	8020301	-012	17.5					N					PA				UN				5g					
Fourmile Creek	8020301	-013	12.8		U															3						
Pigeon Roost	8020301	-014	11.0		U															3						
Wattensaw Bayou	8020301	-015	48.2	WHI0072	M	S	N	S	S	S	S	UN				DO				5f						
TOTAL MILES	257.7																									
MILES UNASSESSED	27.0																									
MILES EVALUATED	43.0																									
MILES MONITORED	160.7																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0031	White River at DeValls Bluff	Y	1	A
WHI0056	Bayou DesArc at Highway 11 near Walker		2	R
UWBDA01	Bayou DesArc at county road above Cypress Creek		2	R
UWBLB01	Bull Bayou at Highway 367 near Beebe		2	R
UWCPB01	Cypress Creek at Highway 13 southeast of Beebe		2	R
WHI0072	Wattensaw Bayou north of Hazen	Y	1	A

Table A-50: Segment 4D Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021504	MCRAE, CITY OF	DRY BRANCH CK,CANE CK,BU DES ARC	08020301		1
AR0022101	BEEBE, CITY OF	CYPRESS BU,BU DES ARC,WHITE RV	08020301		2
AR0022225	DES ARC, CITY OF	WHITE RV	08020301	003	3
AR0022411	HAZEN, CITY OF	LTL HURRICANE CK,WATTENSAW BU,WHITE	08020301	001	4
AR0035611	DEVALLS BLUFF, CITY OF	DIT,WHITE RV	08020301	013	5
AR0038369	AUSTIN, CITY OF	4-MILE CK,BU DES ARC,WHITE RV	08020301	006	6
AR0042803	GRIFFITHVILLE, CITY OF	TRIB,DOGWOOD CK,BAYOU DESARC CK	08020301		7
AR0044822	HIGGINSON, CITY OF	GUM SPRINGS CK,GLADE CK,BU DES ARC	08020301	012	8
AR0047121	VILONIA, CITY OF	CYPRESS BU	08020301	013	9
AR0047554	WARD, CITY OF	4-MILE CK,CYPRESS BU,DES ARC BU	08020301	012	10
AR0047589	BISCOE, CITY OF	WHITE RV	08020301		11
AR0049301	MAXMART #1026	DIT,LTL CYPRESS CK TRIB,CYPRESS BU	08020301	012	12
AR0050156	MAD JACK'S #2, LLC	TRIB,LTL CYPRESS CK,CYPRESS BU,...	08020301		13
AR0050814	WATTENSAW WWTF	WATTENSAW BU, WHITE RV	08020301		14

SEGMENT 4E LITTLE RED RIVER: HEADWATERS TO MOUTH

Segment 4E includes portions of Searcy, Pope, Van Buren, Stone, Cleburne, White, and Independence Counties. The segment contains the entire 81 mile length of the Little Red River and its tributaries: Middle, South, North, Archey, and Devil's Forks, and Big Creek.

Summary of Water Quality Conditions

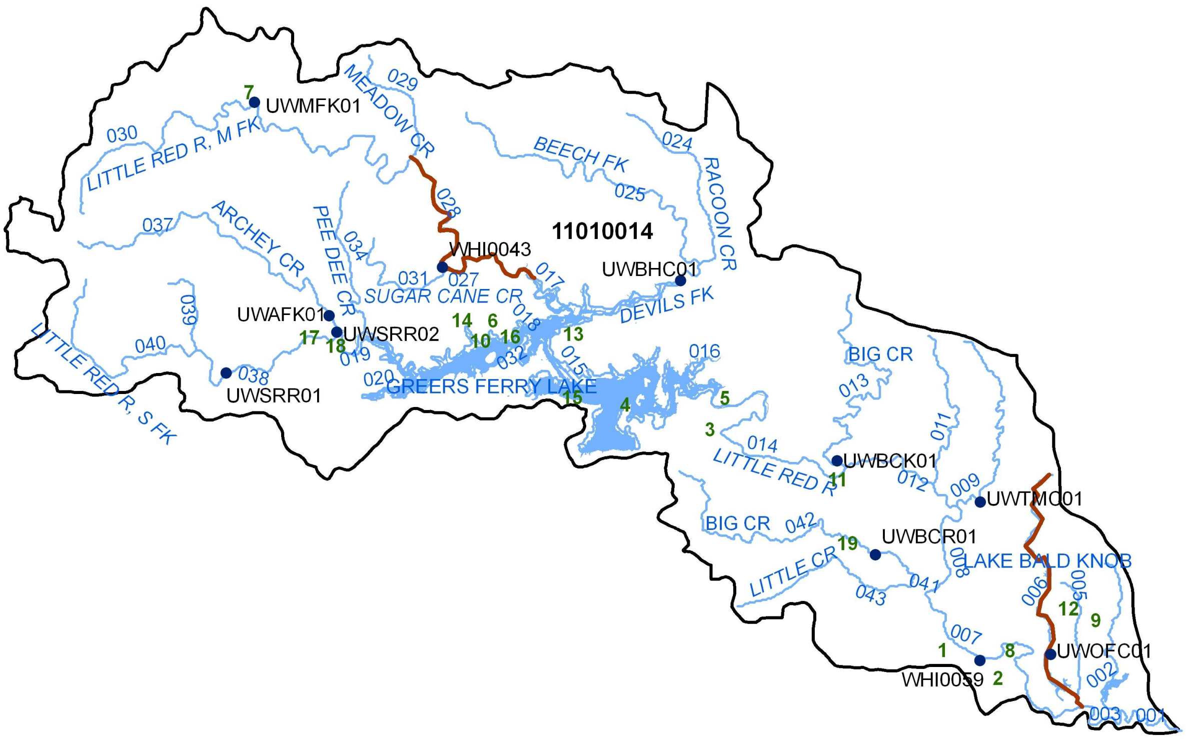
The designated uses of waters within this segment include propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supply. Additionally, 158.1 miles, approximately one-third of the stream miles, are designated as outstanding state or national resource waters. Monitoring stations allowed for use support assessment of 221.4 miles. An additional 48.5 stream miles were evaluated bring the total stream miles assessed in this segment to 269.9.

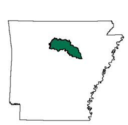
Approximately two miles of the South Fork of the Little Red River at the upper end of Greers Ferry Reservoir was found to have mercury contamination of certain predator fishes and was placed under a fish consumption advisory.

The Middle Fork Little Red River near Shirley is currently assessed as not attaining the primary contact recreation use because of pathogen contamination.

Two segments of Overflow Creek were listed as not supporting the aquatic life use because of zinc toxicity. It is thought that most of the elevated metals detections are associated with the large winter and spring storm events that carry large amounts of clay particles into the creek. Additional investigation is needed to more accurately assess this problem.

Figure A-36: Planning Segment 4E





(Segment 4E)

Permitted Facilities
Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-51: Planning Segment 4E—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4
SEG-4E																							
Little Red R.	11010014	-001	7.5		U															3			
Big Mingo Cr.	11010014	-002	14.4		U															3			
Little Red R.	11010014	-003	5.4		U															3			
Overflow Creek	11010014	-004	0.6		E	S	N	S	S	S	S	AG				Zn				5d			
Unnamed	11010014	-005	9.5		U															3			
Overflow Cr.	11010014	-006	21.7	UWOFC01	M	S	N	S	S	S	S	AG				Zn				5d			
Little Red R.	11010014	-007	21.4	WHI0059	M	S	S	S	S	S	S									1			
Little Red R.	11010014	-008	9.0		U															3			
Ten Mile Creek	11010014	-009	18.6	UWTMC01	M	S	S	S	S	S	S									1			
Little Red R.	11010014	-010	2.9		U															3			
Fourteen Mile	11010014	-011	13.9		U															3			
Little Red R.	11010014	-012	8.0		U															3			
Big Creek	11010014	-013	26.9	UWBCK01	M	S	S	S	S	S	S									1			
Little Red R.	11010014	-014	22.0		U															3			
Devils Fork	11010014	-023	2.9		U															3			
Raccoon Creek	11010014	-024	15.7		U															3			
Beech Creek	11010014	-025	28.4		U															3			
Middle Fork	11010014	-027	8.8	WHI0043	M	S	S	N	S	S	S	UN				PA				5d			
Middle Fork	11010014	-028	12.0		E	S	S	N	S	S	S	UN				PA				5d			
Middle Fork	11010014	-030	44.2	UWMFK01	M	S	S	S	S	S	S									1			
Meadow Creek	11010014	-029	10.3	WHI0153	M	S	S	S	S	S	S									1			
Sugar Cane Cr.	11010014	-031	10.8		U															3			
Pee Dee Creek	11010014	-034	12.9		U															3			
Archey Creek	11010014	-037	27.3	UWAFK01	M	S	S	S	S	S	S									1			
South Fork	11010014	-036	2.0		E	N	S	S	S	S	S	UN				Hg				4a			
South Fork	11010014	-038	14.7	UWSRR01&2	M	S	S	S	S	S	S									1			
Opossum Walk	11010014	-039	7.0		U															3			
South Fork	11010014	-040	17.7		E	S	S	S	S	S	S									1			
Big Creek	11010014	-041	1.2		E	S	S	S	S	S	S									1			
Big Creek	11010014	-042	27.5	UWBCR01	M	S	S	S	S	S	S									1			
Little Creek	11010014	-043	15.0		E	S	S	S	S	S	S									1			
TOTAL MILES	440.2																						
MILES UNASSESSED	170.3																						
MILES EVALUATED	48.5																						
MILES MONITORED	221.4																						

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	267.9	2
AQUATIC LIFE	247.6	22.3
PRIMARY CONTACT	249.1	20.8
SECONDARY CONTACT	269.9	0
DRINKING SUPPLY	269.9	0
AGRI & INDUSTRY	269.9	0

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
UWOFC01	Overflow Creek 1.5 miles southeast of Judsonia		2	R
WHI0059	Little Red River at Highway 367 below Searcy		1	A
UWTMC01	Ten Mile Creek at Highway 157 north of Providence		2	R
UWBCK01	Big Creek off Highway 110 near Hiram		2	R
WHI0043	Middle Fork Little Red River at Highway 9 near Shirley	Y	1	A
UWMFK01	Middle Fork Little Red River at US 65 near Leslie		2	R
WHI0153	Meadow Creek at county road northeast of Old Lexington		2	R
UWAFK01	Archey Fork Little Red River at Highway 65 near Clinton		2	R
UWSRR01	South Fork Little Red River at Highway 95 near Scotland		2	R
UWSRR02	South Fork Little Red River at US 65 near Clinton		2	R
UWBCR01	Big Creek at Highway 16 neat Letona		2	R

Table A-52: Segment 4E Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021601	SEARCY, CITY OF	LTL RED RV,WHITE RV	11010014	007	1
AR0022322	KENSETT, CITY OF	BLACK CK,LTL RED RV,WHITE RV	11010014	007	2
AR0022381	HEBER SPRINGS, CITY OF	LTL RED RV,WHITE RV	11010014	014	3
AR0024066	EDEN ISLE CORP	GREERS FERRY RSVR,LTL RED RV	11010014	015	4
AR0029181	USDIFWS-GREERS FERRY NATL FISH	LITTLE RED RV	11010014	014	5
AR0034401	FAIRFIELD BAY COMM. CLUB, INC	DAVE CK,GREERS FERRY LK,WHITE RV	11010014	032	6
AR0034657	LESLIE, CITY OF	COVE CK	11010014	030	7
AR0035742	JUDSONIA, CITY OF	LTL RED RV	11010014	007	8
AR0035807	BALD KNOB, CITY OF	BIG MINGO CK,LTL RED RV,WHITE RV	11010014		9
AR0037303	FAIRFIELD BAY-HAMILTON HILLS	TRIB,LYNN CK,GREERS FERRY LK	11010014	032	10
AR0039233	PANGBURN, CITY OF	LTL RED RV,WHITE RV	11010014	014	11
AR0042714	ARKANSAS GENERAL INDUSTRIES	DIT,GUM CK,LTL RED RV,WHITE RV	11010014	005	12
AR0043940	WEST SIDE SCHOOL DIST #4	TRIB,GREERS FERRY RSRV	11010014	015	13
AR0044580	FAIRFIELD BAY-LYNN CREEK WWTP	LYNN CK,GREERS FERRY LK,WHITE RV	11010014	032	14
AR0044920	DIAMOND BLUFF ESTATES	GREERS FERRY LK	11010014	015	15
AR0046078	FAIRFIELD BAY-GRAND ISLE	HOOTEN HOLLOW CK,GREERS FERRY LK	11010014	032	16
AR0048747	CLINTON, CITY OF-WEST WASTE WA	TRIB,S FK LT RED RV,GREERS FERRY LK	11010014	038	17
AR0048836	CLINTON, CITY OF-EAST WASTE WA	TRIB,S FRK LTL RED RV,GREERS FERRY	11010014	038	18
AR0049859	LETONA, CITY OF	TRIB,BIG CK,LTL RED RV,WHITE RV	11010014	042	19

SEGMENT 4F WHITE RIVER FROM MOUTH OF BLACK RIVER TO MOUTH OF BUFFALO RIVER

Segment 4F includes Baxter, Fulton, Izard, Searcy, Stone, Sharp, Cleburne, Independence, and Jackson Counties. The segment encompasses a 125-mile reach of the White River and its tributaries; Polk Bayou, Sylamore Creek, Salado Creek, Hicks Creek, North Fork River, and Bennett's River.

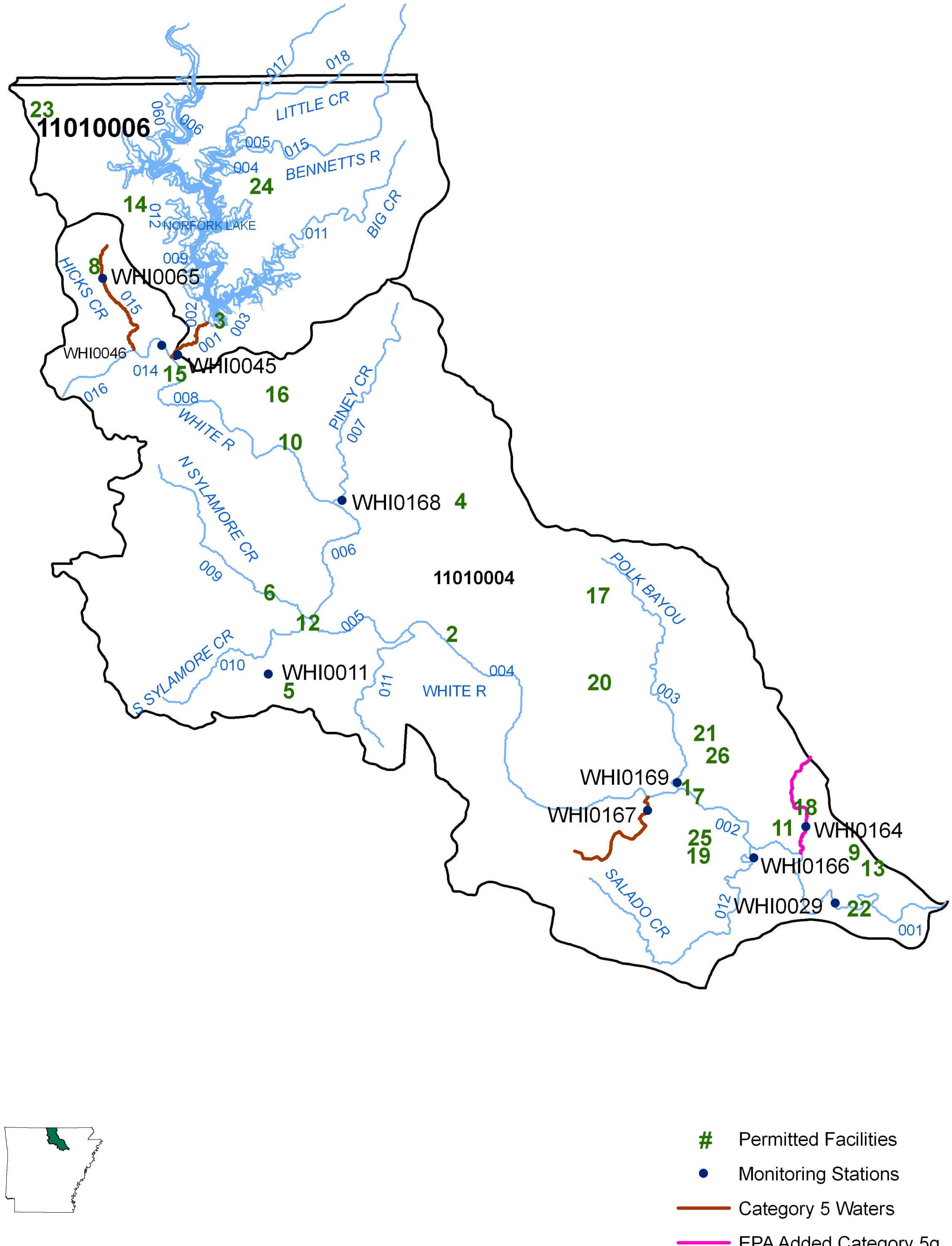
Summary of Water Quality Conditions

Waters within this segment have been designated for fish and wildlife propagation, primary and secondary contact recreation, and domestic, agricultural, and industrial water supply uses. Outstanding state or national resource waters total 19.1 miles within the segment. Use support assessments were made on 277.1 miles of streams.

The 9.1 miles of Hicks Creek did not meet the primary contact recreation use because of high pathogen concentrations. The source of the contaminant is a municipal point source discharge. Additional point source controls will be implemented to address this problem.

The stream segment of the North Fork River below Lake Norfork was listed because of low dissolved oxygen concentrations. The source is from the hydropower facility located at the dam. Actions to correct this problem are currently being discussed.

Figure A-37: Planning Segment 4F



(Segment 4F)

Table A-53: Planning Segment 4F—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-4F																										
White River	11010004	-001	26.7	WHI0029	M	S	S	S	S	S	S									1				FISH CONSUMPTION	277.1	0.0
White River	11010004	-002	8.2		E	S	S	S	S	S	S									1				AQUATIC LIFE	262.3	14.8
Poke Bayou	11010004	-003	23.4	WHI0169	M	S	S	S	S	S	S									1				PRIMARY CONTACT	248.0	29.1
White River	11010004	-004	32.6		E	S	S	S	S	S	S									1				SECONDARY CONTACT	277.1	0.0
White River	11010004	-005	9.6		E	S	S	S	S	S	S									1				DRINKING SUPPLY	277.1	0.0
White River	11010004	-006	12.5		E	S	S	S	S	S	S									1				AGRI & INDUSTRY	277.1	0.0
White River	11010004	-008	23.6		E	S	S	S	S	S	S									1						
Piney Creek	11010004	-007	19.7	WHI0168	M	S	S	S	S	S	S									1						
North Sylamore	11010004	-009	18.4		E	S	S	S	S	S	S									1						
South Sylamore	11010004	-010	16.0	WHI0011	M	S	S	S	S	S	S									1						
Rocky Bayou	11010004	-011	13.5		E	S	S	S	S	S	S									1						
Salado Creek	11010004	-012	27.4	WHI0166	M	S	S	S	S	S	S									1						
North Sylamore	11010004	-013	0.7		E	S	S	S	S	S	S									1						
White River	11010004	-014	4.7	WHI0046	M	S	S	S	S	S	S									1						
Hicks Creek	11010004	-015	9.1	WHI0065	M	S	S	N	S	S	S	MP				PA				5e						
White River	11010004	-016	6.8		E	S	S	S	S	S	S									1						
Greenbrier Creek	11010004	-017	10.6	WHI0167	M	S	N	N	S	S	S	UN	UN			DO	PA			5f	5g					
Big Creek	11010004	-018	9.4	WHI0164	M	S	S	N	S	S	S	UN				PA				5g						
North Fork River	11010006	-001	4.2	WHI0045	M	S	N	S	S	S	S	HP				DO				5a						
Big Creek	11010006	-011	18.4		U															3						
Bennetts River	11010006	-015	15.3		U															3						
Bennetts River	11010006	-017	3.0		U															3						
Bennetts River	11010006	-019	12.7		U															3						
Little Creek	11010006	-018	7.8		U															3						
TOTAL MILES	334.3																									
MILES UNASSESSED	57.2																									
MILES EVALUATED	125.9																									
MILES MONITORED	151.2																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0029	White River at Oil Trough	Y	1	A
WHI0169	Poke Bayou near Batesville		2	R
WHI0168	Piney Creek on county road near Boswell		2	R
WHI0011	South Sylamore Creek below Lick Fork Creek		1	A
WHI0166	Salado Creek at Highway 14 near Salado		2	R
WHI0046	White River		1	A
WHI0065	Hicks Creek below Mountain Home		1	A
WHI0167	Greenbrier Creek at Highway 25 near Batesville		2	R
WHI0164	Big Creek at Highway 394 near Magness		2	R
WHI0045	North Fork White River near Norfork		1	A

Table A-54: Segment 4F Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0001589	GALLOWAY SAND & GRAVEL	WHITE RV	11010004	002	1
AR0001899	UNIMIN CORPORATION-GUION FACIL	ROCKY BU (1) & BACKWATER SLU (9)	11010004	004	2
AR0002437	USDIBSFW-NORFORK NATL FISH HAT	DRY RUN CK,N FORK RV,WHITE RV	11010006	002	3
AR0020036	MELBOURNE, CITY OF	MILL CK,PINEY CK,WHITE RV	11010004	007	4
AR0020117	MOUNTAIN VIEW, CITY OF	HUGHES CK,LICK FRK,SYLAMORE CK	11010004	009	5
AR0020664	USDAFS-BLANCHARD SPRINGS	N SYLAMORE CK,WHITE R	11010004	009	6
AR0020702	BATESVILLE, CITY OF-WWTP	WHITE RV	11010004	002	7
AR0021211	MOUNTAIN HOME, CITY OF-WASTEWA	HICKS CK,BIG CK,WHITE RV	11010004	015	8
AR0021229	NEWARK, CITY OF	WHITE RV	11010004	001	9
AR0034606	CALICO ROCK, CITY OF	WHITE RV	11010004	008	10
AR0035386	FUTUREFUEL CHEMICAL COMPANY	DIT,WHITE RV	11010004	001	11
AR0036081	HOLIDAY MOUNTAIN RESORT	TRIB,SYLAMORE CK,WHITE RV	11010004	009	12
AR0037451	ENTERGY-INDEPENDENCE PLANT	WHITE RV	11010004	001	13
AR0042226	ROLLING MEADOWS MOBILE HOME	TRIB,PANTHER CK,NORFORK LK	11010004	012	14
AR0043036	NORFORK, CITY OF	TOWN CK,WHITE RV	11010004	008	15
AR0044016	AR DEPT OF CORRECTION-IZARD CO	TRIB,MOCCASIN CK,WHITE RV	11010004	008	16
AR0045357	MOUNT PLEASANT HOUSING AUTHORI	BARREN FORK CK,POLK BU,WHITE RV	11010004	003	17
AR0046680	SULPHUR ROCK, CITY OF	BIG CK	11010004	018	18
AR0046779	SOUTHSIDE SCHOOL DIST #3	E BR/DOUBLE CK,CANEY CK	11010004	012	19
AR0047031	CUSHMAN HOUSING AUTHORITY	SPRING CK TRIB, SPRING CK, WHITE RV	11010004	003	20
AR0047406	MIDWEST LIME COMPANY	TRIB,MILLERS CK,POLK BU,WHITE RV	11010004	003	21
AR0047597	OIL TROUGH, CITY OF	WHITE RV	11010004	001	22
AR0048631	NW AR REGIONAL SW MGT DISTRICT	HUTCH CK TRIB,PIGEON CK,LK NORFORK	11010006	006	23
AR0048798	HENDERSON CAR WASH & LAUNDROMA	LK NORFORK TRIB	11010006	012	24
AR0048992	AR HWY DEPT-DISTRICT 5 HQ	DOUBLE BR,CANEY CK,SALADO CK	11010004	012	25
AR0049069	CUSHMAN SAW MILL INC	DIT,HWY 25 DIT,PFEIFER CK,WHITE RV	11010004		26

SEGMENT 4G BLACK RIVER, STRAWBERRY RIVER, AND TRIBUTARIES

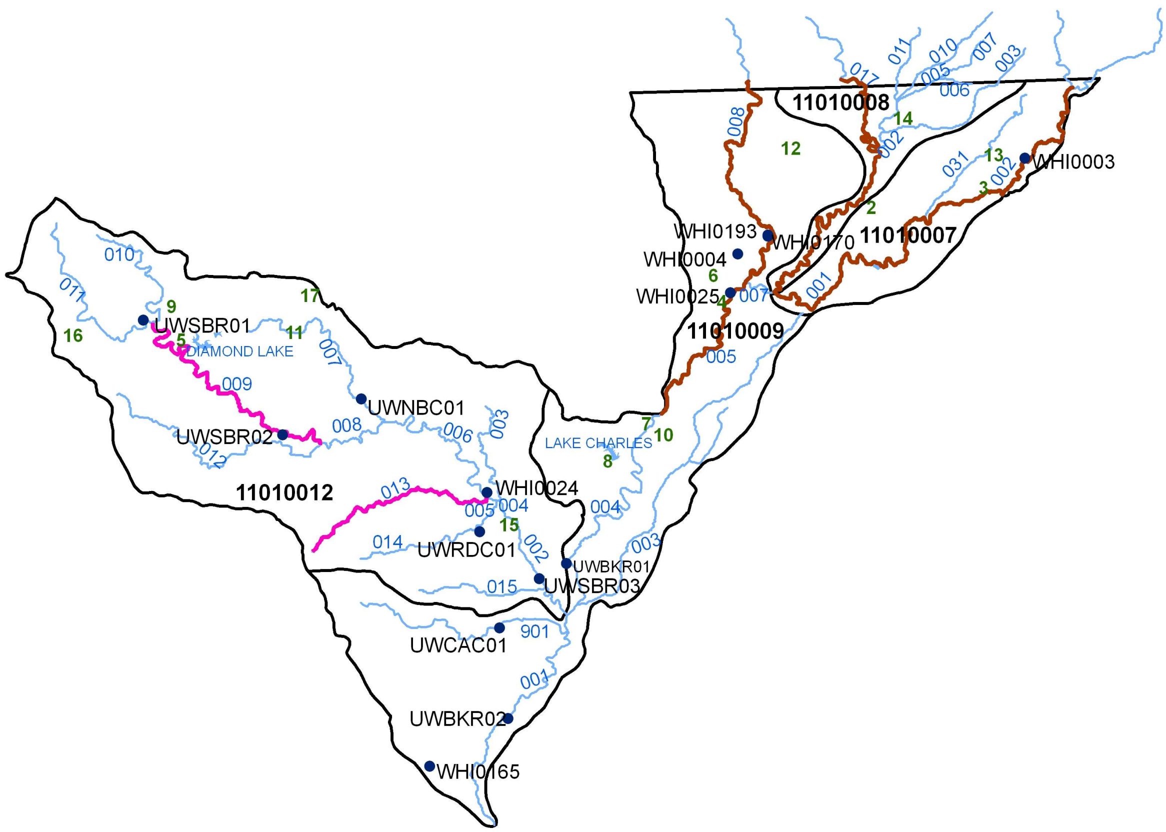
Segment 4G includes portions of Fulton, Izard, Sharp, Independence, Jackson, Lawrence, Randolph, Clay, and Greene Counties in the northeast corner of the State. This segment encompasses a 121-mile reach of the Black River to the Missouri state line, and its tributaries; the Strawberry River and Current River.

Summary of Water Quality Conditions

Fish and wildlife propagation, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies are the designated uses for all waters within this segment. Also, 112.2 miles of these streams are designated as outstanding state or national resource waters. The water quality monitoring stations allowed for the monitored assessment of 389.5 miles of streams in the segment and the evaluation of 51.2 miles.

Almost 40 miles of extraordinary resource waters in this segment were assessed as not supporting aquatic life uses due to excessive turbidity levels. The total suspended solids and total phosphorus levels show peaking values much above normal. This is most likely from agriculture activities probably associated with pasturing and animal grazing to the edge of the stream bank. A TMDL was developed in 2006 addressing the silt issue.

Figure A-38: Planning Segment 4G



(Segment 4G)

Permitted Facilities
Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-55: Planning Segment 4G—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-4G																										
Black River	11010007	-001	24.2		E	S	N	S	S	S	S	UN				DO				5f				FISH CONSUMPTION	440.7	0
Black River	11010007	-002	22.7	WHI0003	M	S	N	S	S	S	S	UN				DO				5f				AQUATIC LIFE	213.1	227.6
Murray Creek	11010007	-031	15.2		U															3				PRIMARY CONTACT	393	47.7
Current River	11010008	-001	23.6	WHI0004	M	S	N	S	S	S	S	SE	UN			SI	DO			5a	5f			SECONDARY CONTACT	440.7	0
Current River	11010008	-017	12.0		E	S	N	S	S	S	S	SE	UN			SI	DO			5a	5f			DRINKING SUPPLY	440.7	0
Little Black	11010008	-002	2.5		U															3				AGRI & INDUSTRY	440.7	0
Byrnes Ditch	11010008	-003	16.2		U															3						
Little Black	11010008	-004	3.7		U															3						
Indian Creek	11010008	-005	4.1		U															3						
Black River	11010009	-001	25.8	UWBKR02	M	S	S	S	S	S	S									1						
Black River	11010009	-002	1.2		E	S	S	S	S	S	S									1						
Black River	11010009	-004	27.4	UWBKR01	M	S	S	S	S	S	S									1						
Black River	11010009	-005	17.5	WHI0025	M	S	N	S	S	S	S	UN				DO				5f						
Black River	11010009	-007	3.8		U															3						
Big Running C.	11010009	-003	36.0		U															3						
Fourche River	11010009	-008	25.0	WHI0170	M	S	N	S	S	S	S	SE				SI				5d						
Strawberry R.	11010012	-001	4.4		E	S	S	S	S	S	S									1						
Strawberry R.	11010012	-002	9.4	UWSBR03	M	S	N	S	S	S	S	SE				SI				4a						
Coopers Creek	11010012	-003	11.8	WHI0143S	M	S	S	S	S	S	S									1						
Strawberry R.	11010012	-004	0.3		E	S	N	S	S	S	S	SE				SI				4a						
Strawberry R.	11010012	-005	0.7		E	S	N	S	S	S	S	SE				SI				4a						
Strawberry R.	11010012	-006	19.0	WHI0024	M	S	N	S	S	S	S	SE				SI				4a						
N. Big Creek	11010012	-007	20.8	UWNBC01	M	S	S	S	S	S	S									1						
Strawberry R.	11010012	-008	8.4		E	S	N	S	S	S	S	SE				SI				4a						
Strawberry R.	11010012	-009	28.4	UWSBR02	M	S	N	N	S	S	S	SE	UN			SI	PA			4a	5g					
L. Strawberry R.	11010012	-010	16.0	WHI0143H+	M	S	N	S	S	S	S	SE				SI				4a						
Strawberry R.	11010012	-011	20.4	UWSBR01	M	S	N	S	S	S	S	SE				SI				4a						
Piney Fork	11010012	-012	26.1	WHI0143L+	M	S	S	S	S	S	S									1						
S. Big Creek	11010012	-013	19.3	WHI0143J+	M	S	S	N	S	S	S	UN				PA				5g						
Reeds Creek	11010012	-014	15.0	UWRDC01	M	S	S	S	S	S	S									1						
Mill Creek	11010012	-016	9.9	WHI0143N	M	S	S	S	S	S	S									1						
Caney Creek	11010012	-015	11.6	WHI0143Q&R	M	S	S	S	S	S	S									1						
Curia Creek	11010009	-901	18.0	UWCAC01	M	S	S	S	S	S	S									1						
Data Creek	11010009	-902	21.8	WHI0165	M	S	S	S	S	S	S									1						
TOTAL MILES	522.2																									
MILES UNASSESSED	81.5																									
MILES EVALUATED	51.2																									
MILES MONITORED	389.5																									

Table A-55 (cont.): Planning Segment 4G—Designated Use Attainment Status and Water Quality Monitoring Stations

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0003	Black River at Highway 63 east of Corning	Y	1	A
WHI0004	Current River near Pocahontas	Y	1	A
UWBKR02	Black River at Highway 37 east of Cord		2	R
UWBKR01	Black River east of Highway 361 north of Strawberry		2	R
WHI0025	Black River at Pocahontas	Y	1	A
WHI0170	Fourche Creek at Highway 166 north of Pocahontas		1	R
UWSBR03	Strawberry River at Highway 361 near Saffell		2	R
WHI0143S	Cooper Creek at county road east of Highway 115 south of Smithville		2	S
WHI0024	Strawberry River south of Smithville	Y	1	A
UWNBC01	North Big Creek off Highway 354 east of Center		2	R
UWSBR02	Strawberry River at Highway 167 at Evening Shade		2	R
WHI0143H+	Little Strawberry River at Highway 354 east of Wiseman		2	S
UWSBR01	Strawberry River off Highway 354 near Wiseman		2	R
WHI0143L+	Piney Fork Creek at county road west of Zion		2	S
WHI0143J+	South Big Creek at Highway 117 near Jesup		2	S
UWRDC01	Reeds Creek at Highway 117 north of Strawberry		2	R
WHI0143N	Mill Creek on Strawberry Road south of Sitka		2	S
WHI0143Q+	Caney Creek on county road 346 near Saffell		2	S
UWCAC01	Curia Creek at Highway 25 north of Dowdy		2	R
WHI0165	Data Creek on Highway 25 near Mt. Zion		1	S

Table A-56: Segment 4G Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0022110	CAVE CITY, CITY OF	CURIA CK,BLACK RV	11010009	901	1
AR0022209	REYNO, CITY OF	MURRAY CK,GAR SLU,BLACK RV,WHITE RV	11010007	031	2
AR0033979	CORNING, CITY OF	BLACK RV	11010007	002	3
AR0034835	POCAHONTAS, CITY OF	BLACK RV,WHITE RV	11010009	005	4
AR0035254	HORSESHOE BEND, CITY OF-WHITE	TRIB,STRAWBERRY R	11010012	009	5
AR0036820	MACLEAN-ESNA	MANSKER CK TRIB,BLACK RV	11010009	005	6
AR0037508	BLACK ROCK, CITY WATER & SEWER	TRIB,BLACK RV,WHITE RV	11010009	004	7
AR0038199	AR PARKS & TOURISM-LK CHARLES	LK CHARLES	11010009	004	8
AR0039608	HORSESHOE BEND, CITY OF-PARADI	TRIB, HUBBLE BRANCH,LTL STRAWBERRY RV,STRAWBERRY R	11010012	010	9
AR0040355	PORTIA, CITY OF	BLACK RV,BLACK & SPRING RVS,WHITE	11010009	004	10
AR0041742	ASH FLAT, CITY OF	N BIG CK,STRWBERRY RV,BLACK RV, WHITE RIVER	11010012	007	11
AR0043834	MAYNARD, CITY OF	LEMMONS CK,BIG CK,FOURCHE RV,BLACK	11010009	008	12
AR0047911	J.W. BLACK LUMBER COMPANY	TRIB,CORNING LK,BLACK RV	11010007	031	13
AR0048071	SUCCESS, TOWN OF	TRIB,BYRNES DIT,LTL BLACK RV,...	11010008	003	14
AR0048488	WESTERN LAWRENCE CO WWT DIST	STRAWBERRY RV TRIB,STRAWBERRY RV	11010012	002	15
AR0049701	OXFORD, CITY OF	SANDY CK,STRAWBERRY RV, BLACK RV...	11010012	011	16
AR0050261	HIGHLAND, CITY OF-WASTEWATER T	TRIB,WORTHINGTON CK,HACKNER CK	11010012	007	17

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SEGMENT 4H SPRING RIVER, SOUTH FORK SPRING RIVER, AND ELEVEN POINT RIVER

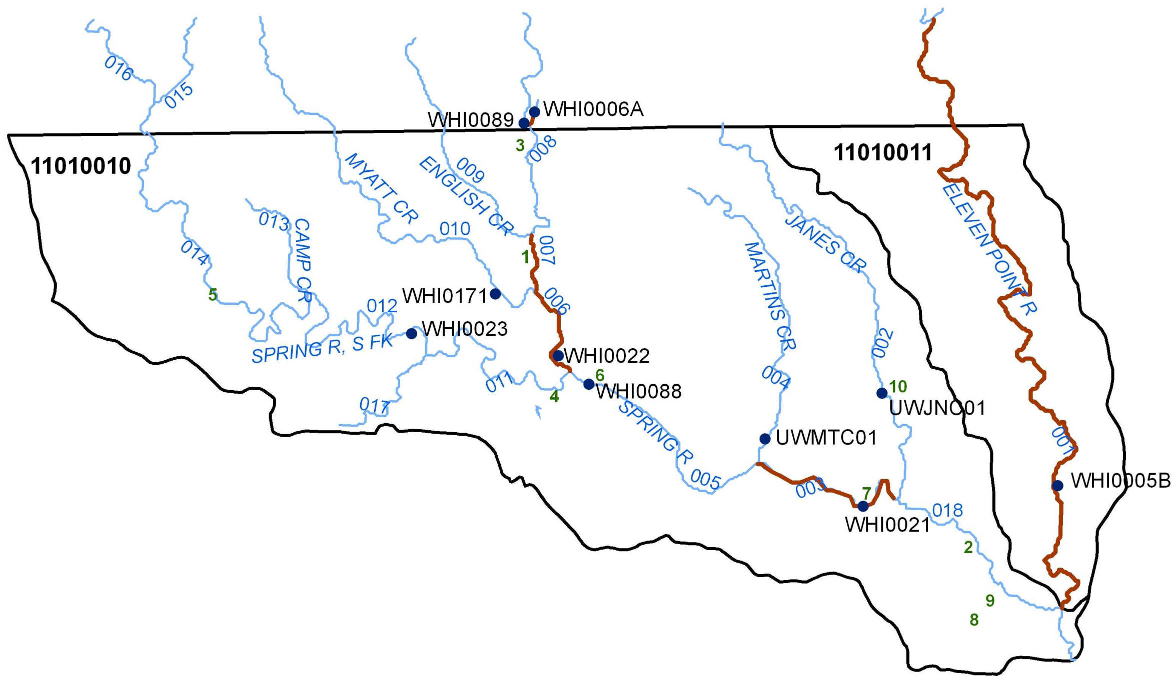
Segment 4H, in north central Arkansas, includes portions of Fulton, Sharp, and Randolph Counties. The segment encompasses the entire 46-mile length of the Spring River and its tributaries; the South Fork Spring River, the Eleven Point River, Myatt Creek, and Martin's Creek.

Summary of Water Quality Conditions

Designated uses for all waters within this segment include propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agriculture, and industrial water supplies. Additionally, about 74 percent of these waters are designated as outstanding state or national resource waters. Approximately 217 miles of the waters were assessed from seven permanent and three temporary monitoring stations. Of that, 56.7 miles were evaluated and 160.2 were monitored.

Two segments of the Spring River were listed in Category 5f for temperature. The in stream water temperature in the lower portion of segment 006 and in segment 007 routinely exceeds 20 degrees Celsius during the hotter times of the year. This is a naturally occurring event. The 20 degrees Celsius water temperature standard was placed on these stream segments to protect the non-native trout fishery.

Figure A-39: Planning Segment 4H



(Segment 4H)

Table A-57: Planning Segment 4H—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-4H																										
Spring River	11010010	-001	3.3		E	S	S	S	S	S	S									1				FISH CONSUMPTION	216.9	0
Janes Creek	11010010	-002	26.7	UWJNC01	M	S	S	S	S	S	S									1				AQUATIC LIFE	162	54.9
Spring River	11010010	-003	9.4	WHI0021	M	S	N	S	S	S	S	SE	UN			SI	DO			5d	5f			PRIMARY CONTACT	216.9	0
Martins Creek	11010010	-004	19.0	UWMTC01	M	S	S	S	S	S	S									1				SECONDARY CONTACT	216.9	0
Spring River	11010010	-005	13.2	WHI0088	M	S	S	S	S	S	S									1				DRINKING SUPPLY	216.9	0
Spring River	11010010	-006	5.3	WHI0022	M	S	N	S	S	S	S	UN				Temp				5f				AGRI & INDUSTRY	213.8	3.1
Spring River	11010010	-007	4.0		E	S	N	S	S	S	S	UN				Temp				5f						
Warm Fork Spring R.	11010010	-008t	3.1	WHI006A	M	S	N	S	S	S	N	UN	UN			DO	TDS			5d	5d					
Spring River	11010010	-008	8.8	WHI0089	M	S	S	S	S	S	S									1						
English Creek	11010010	-009	6.5		U															3						
Myatt Creek	11010010	-010	26.0	WHI0171	M	S	S	S	S	S	S									1						
S. Fork Spring	11010010	-011	13.4		E	S	S	S	S	S	S									1						
S. Fork Spring	11010010	-012	15.6	WHI0023	M	S	S	S	S	S	S									1						
S. Fork Spring	11010010	-014	24.0		E	S	S	S	S	S	S									1						
Camp Creek	11010010	-013	7.0		U															3						
Wild Horse C.	11010010	-017	7.7		U															3						
Spring River	11010010	-018	12.0		E	S	S	S	S	S	S									1						
Eleven Point	11010011	-001	33.1	WHI0005B	M	S	N	S	S	S	S	UN				DO				5f						
TOTAL MILES	238.1																									
MILES UNASSESSED	21.2																									
MILES EVALUATED	56.7																									
MILES MONITORED	160.2																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
UWJNC01	Janes Creek at Highway 90 near Ravenden Springs		2	R
WHI0021	Spring River south of Ravenden	Y	1	A
UWMTC01	Martins Creek at Highway 63 near Williford		2	R
WHI0088	White River at Town Bridge in Hardy		1	A
WHI0022	Spring River at low water crossing near Hardy	Y	1	A
WHI0006A	Warm Fork Spring River near Thayer, Mo	Y	1	A
WHI0089	Mammoth Spring east bridge at spillway		1	A
WHI0171	Myatt Creek at Bakers Ford road near Saddle		2	R
WHI0023	South Fork of Spring River near Saddle	Y	1	A
WHI0005B	Eleven Point River near Pocahontas	Y	1	A

Table A-58: Segment 4H Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0002879	AR GAME & FISH COMM-JIM HINKLE	SPRING RV	11010010	007	1
AR0021628	IMBODEN, CITY OF	WAYLAND CK,SPRING RV,BLACK RV,WHITE	11010010	018	2
AR0023850	MAMMOTH SPRING, CITY OF	SPRING RV TRIB,SPRING RV	11010010	008	3
AR0034282	CHEROKEE VILLAGE SEWER, INC	S FRK SPRING RV	11010010	011	4
AR0034789	SALEM, CITY OF	S FRK,SPRING RV,BLACK RV,WHITE RV	11010010	014	5
AR0037991	HARDY, CITY OF	SPRING RV,BLACK RV,WHITE RV	11010010	005	6
AR0041254	RAVENDEN, CITY OF	TRIB,SPRING RV,BLACK RV	11010010	003	7
AR0046922	VULCAN CONSTR MATERIALS-BLACK	HWY 63 DIT,TRIB,BRUSHY CK,STENNIT C	11010010	018	8
AR0047198	MARTIN MARIETTA MATERIALS-BLAC	STENNITT CK	11010010	018	9
AR0048712	RAVENDEN SPRINGS, TOWN OF	JOHNS CK TRIB,JANES CK,SPRING RV	11010010	002	10

SEGMENT 4I WHITE RIVER FROM CROOKED CREEK TO LONG CREEK

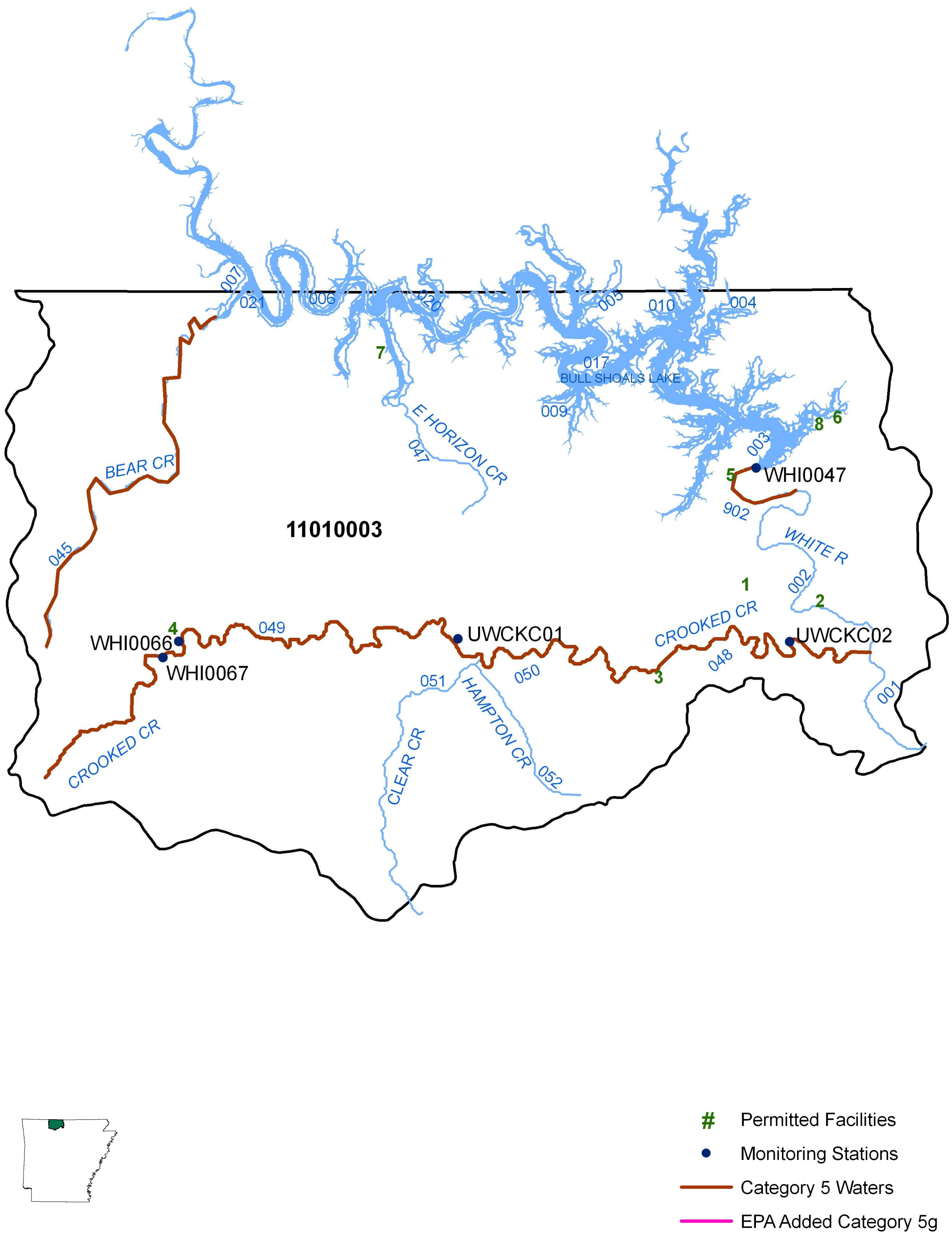
Segment 4I, located in north central Arkansas, includes portions of Boone and Marion Counties, and small portions of Baxter, Searcy, and Newton Counties. This segment encompasses a 31-mile reach of the White River, and Crooked Creek and its tributaries.

Summary of Water Quality Conditions

All waters within this segment are designated for fish and wildlife propagation, primary and secondary contact recreation, domestic, agricultural, and industrial water supplies. None of these waters, except Bull Shoals Reservoir, are designated as outstanding state or national resources. Five monitoring stations were used to assess 117.2 miles of stream, and 7.6 stream miles were evaluated.

Data from Crooked Creek above and below the City of Harrison sewage treatment plant demonstrates some elevated parameters from this discharge and also reflects urban area runoff during storm events.

Figure A-40: Planning Segment 4I



(Segment 4I)

Table A-59: Planning Segment 4I—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-4I																										
White River	11010003	-001	7.6		E	S	S	S	S	S	S									3				FISH CONSUMPTION	124.8	0
White River[1]	11010003	-902	3.0	USGS	M	S	N	S	S	S	S	HP				DO				5a				AQUATIC LIFE	53.9	70.9
White River[2]	11010003	-002	20.4	USGS	M	S	S	S	S	S	S									3				PRIMARY CONTACT	124.8	0
Bear Creek	11010003	-045	25.9	WHI0174	M	S	S	S	S	N	S	UN				Be				5d				SECONDARY CONTACT	124.8	0
E. Horizon C.	11010003	-047	8.9		U															3				DRINKING SUPPLY	98.9	25.9
Crooked Creek	11010003	-048	31.7	WH00I48A+	M	S	N	S	S	S	N	RE	UN			Temp	TDS			5a	5a			AGRI & INDUSTRY	56.9	67.9
Crooked Creek	11010003	-049	36.2	WHI0066+	M	S	N	S	S	S	N	UN	UN	UN	UN	TDS	CL	SO4	Be	5a	5a	5a	5a			
Clear Creek	11010003	-050	0.4		U															3						
Clear Creek	11010003	-051	17.6		U															3						
Hampton Creek	11010003	-052	9.1		U															3						
TOTAL MILES	160.8																									
MILES UNASSESSED	36.0																									
MILES EVALUATED	7.6																									
MILES MONITORED	117.2																									

1 Reach formally -002U

2 Reach formally -002L

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0174	Bear Creek at Highway 14 east of New Hope		2	R
WHI0148A	Crooked Creek at Highway 14 near Yellville	Y	1	A
WHI0148B	Crooked Creek south of Flippin		1	A
WHI0148C	Crooked Creek at Highway 101 near Rea Valley		1	A
WHI0066	Crooked Creek below Harrison		1	A
WHI0067	Crooked Creek above Harrison		1	A

Table A-60: Segment 4I Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021717	FLIPPIN, CITY OF	FALLEN ASH CK,WHITE RV	11010003	002L	1
AR0033545	COTTER-GASSVILLE WASTEWATER	WHITE RV	11010003	002L	2
AR0034037	YELLVILLE, CITY OF	CROOKED CK,WHITE RV	11010003	048	3
AR0034321	HARRISON, CITY OF	CROOKED CK,WHITE RV	11010003	049	4
AR0037028	BULL SHOALS, CITY OF	WHITE RV	11010003	002U	5
AR0037435	HOLIDAY SHORES RESORT	BULL SHOALS LK	11010003	003	6
AR0043753	SUGARLOAF WASTEWATER TREATMENT	E SUGARLOAF CK,BULL SHOALS LK	11010003	020	7
AR0048518	LAURENCE'S CEDAR OAKS RESORT	BULL SHOALS LK	11010003	003	8

SEGMENT 4J BUFFALO RIVER AND TRIBUTARIES

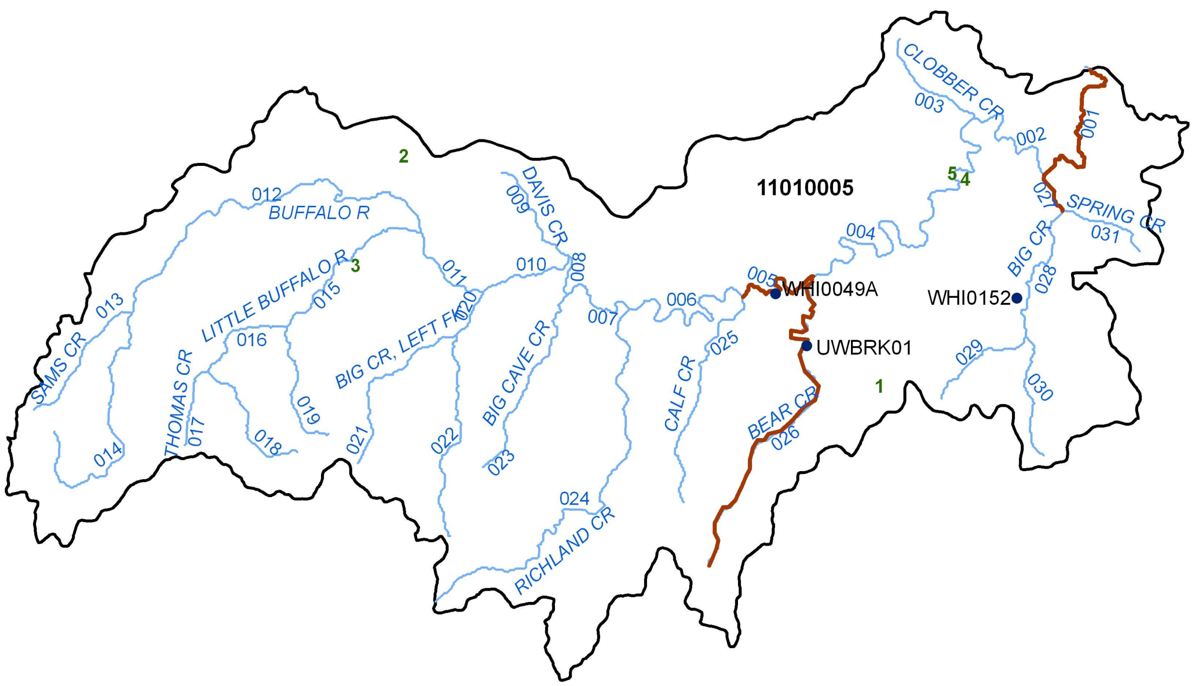
Segment 4J includes portions of Newton, Searcy, and Marion Counties, and small portions of Boone, Pope, Baxter, Stone, and Van Buren Counties in north central Arkansas. This segment contains the entire 113-mile length of the Buffalo River and its tributaries; Big Creek, Little Buffalo River, Richland Creek, Water Creek, Bear Creek, and others.

Summary of Water Quality Conditions

Designated uses of waters in this segment include propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies. Almost 48 percent of the stream miles are also designated as outstanding state or national resource waters. Only one routine monitoring station is located in this segment; however, over the past several years, a cooperative project with the Buffalo National River has added close to 60 sites on the Buffalo River, its tributaries, and watershed springs. This has allowed for the assessment of 264.1 stream miles and the evaluation of another 53 stream miles.

The main stem of the Buffalo River near Marshall had four critical season dissolved oxygen readings below the 6.0 mg/L standard. These occurred during the summer months of 2001 and 2002. No violations have occurred since.

Figure A-41: Planning Segment 4J



(Segment 4J)

Table A-61: Planning Segment 4J—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS			
												1	2	3	4	1	2	3	4	1	2	3	4
SEG-4J																							
Buffalo River	11010005	-001	11.3	BUFR09	M	S	N	S	S	S	S	UN				Temp				5f			
Buffalo River	11010005	-002	8.7		M	S	S	S	S	S	S									1			
Clabber Creek	11010005	-003	7.3	BUFT17	M	S	S	S	S	S	S									1			
Buffalo River	11010005	-004	27.8	BUFR07&08	M	S	S	S	S	S	S									1			
Buffalo River	11010005	-005	6.9	WHI0049A	M	S	N	S	S	S	S	UN				DO				5f			
Buffalo River	11010005	-006	13.7		M	S	S	S	S	S	S									1			
Buffalo River	11010005	-007	5.9	BUFR05	M	S	S	S	S	S	S									1			
Buffalo River	11010005	-008	2.6		M	S	S	S	S	S	S									1			
Davis Creek	11010005	-009	7.3	BUFT07	M	S	S	S	S	S	S									1			
Buffalo River	11010005	-010	6.2		M	S	S	S	S	S	S									1			
Buffalo River	11010005	-011	6.0	BUFR04	M	S	S	S	S	S	S									1			
Buffalo River	11010005	-012	25.8	BUFR02&03	M	S	S	S	S	S	S									1			
Sams Creek	11010005	-013	9.0		M	S	S	S	S	S	S									1			
Buffalo River	11010005	-014	18.2	BUFR01	M	S	S	S	S	S	S									1			
Little Buffalo	11010005	-015	11.6	BUFT05	M	S	S	S	S	S	S									1			
Little Buffalo	11010005	-016	6.6		E	S	S	S	S	S	S									1			
Thomas Creek	11010005	-017	5.2		U															3			
East Fork	11010005	-018	8.9		U															3			
Shop Creek	11010005	-019	8.6		U															3			
Big Creek	11010005	-020	3.2	BUFT06	M	S	S	S	S	S	S									1			
Big Creek Left Fk.	11010005	-021	11.7		E	S	S	S	S	S	S									1			
Big Creek	11010005	-022	13.7		E	S	S	S	S	S	S									1			
Big Cave Cr.	11010005	-023	13.0	BUFT08	M	S	S	S	S	S	S									1			
Richland Creek	11010005	-024	28.7	BUFT09	M	S	S	S	S	S	S									1			
Calf Creek	11010005	-025	15.0	BUFT10	M	S	S	S	S	S	S									1			
Bear Creek	11010005	-026	23.9	UWBRK01,+	M	S	S	S	S	S	N	MP				TDS				5d			
Big Creek	11010005	-027	2.6	BUFT18	M	S	N	S	S	S	S	UN				DO				5d			
Big Creek	11010005	-028	9.4	WHI0152	M	S	S	S	S	S	S									1			
Big Creek	11010005	-029	7.1		E	S	S	S	S	S	S									1			
Sellers Creek	11010005	-030	8.1		E	S	S	S	S	S	S									1			
Spring Creek	11010005	-031	5.8		E	S	S	S	S	S	S									1			
TOTAL MILES	339.8																						
MILES UNASSESSED	22.7																						
MILES EVALUATED	53.0																						
MILES MONITORED	264.1																						

USE	SUPPORT	NOT SUPPORT
FISH CONSUMPTION	317.1	0
AQUATIC LIFE	296.3	20.8
PRIMARY CONTACT	317.1	0
SECONDARY CONTACT	317.1	0
DRINKING SUPPLY	317.1	0
AGRI & INDUSTRY	293.2	23.9

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
BFR09	Buffalo River near its mouth		1	USNPS
BUFT7	Clabber Creek		1	USNPS
BFR07	Buffalo River at Highway 14		1	USNPS
BFR08	Buffalo River at Rush		1	USNPS
WHI0049A	Buffalo River at Highway 65 near St. Joe	Y	1	A
BFR05	Buffalo River at Woolum		1	USNPS
BUFT07	Davis Creek		1	USNPS
BUFR04	Buffalo River at Hasty		1	USNPS
BUFR02	Buffalo River at Ponca		1	USNPS
BUFR03	Buffalo River near Pruitt		1	USNPS
BUFR01	Buffalo River at Wilderness Boundary		1	USNPS
BUFT05	Little Buffalo River		1	USNPS
BUFT06	Big Creek - Newton County		1	USNPS
BUFT08	Cave Creek		1	USNPS
BUFT09	Richland Creek		1	USNPS
BUFT10	Calf Creek		1	USNPS
UWBRK01	Bear Creek at Highway 65, 4 miles west of Marshall		2	R
BUFT18	Big Creek - Marion County		1	USNPS
WHI0152	Big Creek at Highway 14, west of Big Flat		2	R

Table A-62: Segment 4J Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0034011	MARSHALL, CITY OF	TRIB,FOREST CK,BEAR CK,BUFFALO RIV	11010005	026	1
AR0034088	MARBLE FALLS SID	TRIB,MILL CK,BUFFALO RV,WHITE RV	11010005	012	2
AR0034584	JASPER, CITY OF	LTL BUFFALO RV,BUFFALO RV	11010005	015	3
AR0034941	USDINPS-BUFFALO NATL RV-BUFFAL	BUFFALO RV	11010005	004	4
AR0034959	USDINPS-BUFFALO NATL RV-BUFFAL	PANTHER CK,BUFFALO RV	11010005	004	5

SEGMENT 4K UPPER WHITE RIVER AND KINGS RIVER

Segment 4K includes portions of Washington, Benton, Madison, Carroll, Boone, Newton, and Franklin Counties in northwest Arkansas. This segment encompasses a 66-mile reach of the White River and its tributaries and an 85-mile reach of the Kings River and its tributaries. It also includes Long Creek and Yocum Creek.

Summary of Water Quality Conditions

All waters within this segment are designated for propagation of fish and wildlife, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies. Also, about 20 percent of these waters are designated as outstanding state or national resource waters. A total of 327.3 miles of streams were monitored for use support and an additional 138.7 miles were evaluated.

Aquatic life use was assessed as not supported in the West Fork of the White River and the White River downstream of the West Fork. The major cause was high turbidity levels and excessive silt loads (Figure A-43). A TMDL to address this issue was completed in 2006.

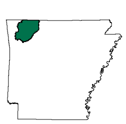
The Middle Fork White River and the White River occasionally failed to meet the dissolved oxygen standard of 6.0 mg/L. The exact cause of the impairment is unknown at this time.

Several stream segments in this planning segment were listed as not supporting the drinking water use because of beryllium concentrations. Additional monitoring and an investigation into the proper standard are needed.

A point source discharge to Holman Creek has impaired the drinking water use of the lower section of this stream by discharges of excessive levels of total dissolved solids. Additional investigations are needed to address this problem.

Total phosphorus levels in the Kings River and Osage Creek below the Berryville WWTP have decreased significantly over the past six years (Figure A-44).

Figure A-42: Planning Segment 4K



(Segment 4K)

#	Permitted Facilities
●	Monitoring Stations
—	Category 5 Waters
—	EPA Added Category 5g

Table A-63: Planning Segment 4K—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE				CAUSE				STATUS				USE	SUPPORT	NOT SUPPORT
												1	2	3	4	1	2	3	4	1	2	3	4			
SEG-4K																										
White River	11010001	-022	8.3		U															3				FISH CONSUMPTION	473.6	0
White River	11010001	-023	6.2	WHI0052	M	S	N	S	S	S	N	UN	UN	UN	SE	TDS	CL	SO4	SI	5a	5a	5a	4a	AQUATIC LIFE	367.8	105.8
West Fork	11010001	-024	27.2	WHI0051+	M	S	N	S	S	S	N	UN	UN	UN	SE	TDS	SO4	DO	SI	5a	5a	5f	4a	PRIMARY CONTACT	473.6	0
White River	11010001	-025	2.4		U															3				SECONDARY CONTACT	473.6	0
Middle Fork[1]	11010001	-926	13.8	WHI0102	M	S	S	S	S	S	S									1				DRINKING SUPPLY	339.5	134.1
Middle Fork[2]	11010001	-026	8.1	WHI0103	M	S	N	S	S	S	S	UN				DO				5d				AGRI & INDUSTRY	372.5	101.1
White River[3]	11010001	-927	6.6	WHI0105	M	S	S	S	S	S	S									1						
White River[4]	11010001	-027	17.2	WHI0106+	M	S	N	S	S	N	S	UN	UN			DO	Be			5d	5d					
Mill Creek	11010001	-028	6.1		E	S	S	S	S	S	S									1						
White River	11010001	-029	13.5		E	S	S	S	S	S	S									1						
Richland Cr.	11010001	-030	12.1	WHI0109	M	S	S	S	S	S	S									1						
Lollar Creek	11010001	-031	12.5		E	S	S	S	S	S	S									1						
Richland Cr.	11010001	-032	7.1		E	S	S	S	S	S	S									1						
Brush Creek	11010001	-033	13.5	WHI0112	M	S	S	S	S	S	S									1						
War Eagle Cr.	11010001	-034	22.2	WHI0116	M	S	S	S	S	N	S	UN				Be				5d						
War Eagle Cr.	11010001	-035	8.6		E	S	S	S	S	S	S									1						
Leatherwood Creek	11010001	-916	7.6	WHI0012B	M	S	N	S	S	S	S	UN				DO				5d						
Clear Creek	11010001	-036	6.7		E	S	S	S	S	S	S									1						
Kings River	11010001	-037	19.1	WHI0009A	M	S	S	S	S	S	N	UN				TDS				5d						
Kings River	11010001	-038	3.4	WHI0077	M	S	S	S	S	S	S									1						
Kings River	11010001	-040	17.9		E	S	S	S	S	S	S									1						
Kings River	11010001	-041	4.8	WHI0121	M	S	S	S	S	S	S									1						
Kings River	11010001	-042	39.5	WHI0123	M	S	N	S	S	N	N	UN	UN	UN		Be	TDS	DO		5d						
Keels Creek	11010001	-039	7.3		E	S	S	S	S	S	S									1						
Dry Fork	11010001	-043	16.5	WHI0127	M	S	S	S	S	N	S	UN				Be				5d						
Piney Creek	11010001	-044	10.2	WHI0126	M	S	S	S	S	S	S									1						
Osage Creek[5]	11010001	-945	25.6	WHI0068+	M	S	S	S	S	S	S									1						
Osage Creek[6]	11010001	-045	5.0	WHI0069	M	S	S	S	S	S	S									1						
South Fork	11010001	-046	13.8		E	S	S	S	S	S	S									1						
Osage Creek	11010001	-047	13.4		E	S	S	S	S	N	S	UN				Be				5d						
Yocum Creek	11010001	-052	16.2	WHI0137	M	S	S	S	S	N	S	UN				Be				5d						
Long Creek	11010001	-054	8.4	WHI0071	M	S	S	S	S	S	S									1						
Dry Creek	11010001	-055	12.0		E	S	S	S	S	S	S									1						
Long Creek	11010001	-056	14.3	WHI0134+	M	S	S	S	S	S	S									1						
Long Creek	11010001	-057	8.6		E	S	S	S	S	S	S									1						
Terrapin Cr.	11010001	-058	11.2		E	S	S	S	S	S	S									1						
Holman Creek	11010001	-059	9.1	WHI0070	M	S	S	S	S	N	N	MP	MP			TDS	NO3			5a	4a					
War Eagle Cr.	11010001	-060	28.3	WHI0114	M	S	S	S	S	S	S									1						
TOTAL MILES	484.3																									
MILES UNASSESSED	10.7																									
MILES EVALUATED	138.7																									
MILES MONITORED	334.9																									

1 Reach formally -026U
2 Reach formally -026L
3 Reach formally -027U
4 Reach formally -027L
5 Reach formally -045U
6 Reach formally -045L

Table A-63 (cont.): Planning Segment 4K—Designated Use Attainment Status and Water Quality Monitoring Stations

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
WHI0052	White River near Goshen	Y	1	A
WHI0098	West Fork White River at county road bridge below Dye Creek near West Fork		2	R
WHI0051	West Fork White River near Fayetteville	Y	1	A
WHI0102	Middle Fork White River at county road 32, I mile south of Sulphur City		2	R
WHI0103	Middle Fork White River west of Elkins	Y	2	A
WHI0106	White River near Durham		1	A
WHI0105	White River near Crosses		2	R
WHI0109	Richland Creek1 mile north of Tuttle		2	R
WHI0112	Brush Creek north of Highway 45 off Highway 303		2	R
WHI0116	War Eagle Creek at Highway 45, north of Hindsville	Y	1	A
WHI009A	Kings River north of Berryville	Y	1	A
WHI0077	Kings River below Berryville		2	R
WHI0121	Kings River at Highway 21		2	R
WHI0123	Kings River northeast of Alabam	Y	1	A
WHI0127	Dry Fork Creek west of Metalton		2	R
WHI0126	Piney Creek northwest of Metalton		2	R
WHI0068	Osage Creek above Berryville	Y	1	A
WHI0130	Osage Creek northeast of Metalton		2	R
WHI0069	Osage Creek below Berryville		1	A
WHI0137	Yocum Creek on county road 1.25 miles northwest of Highway 311		2	R
WHI0071	Long Creek below Denver	Y	1	A
WHI0134	Long Creek near Denver		2	R
WHI0175	Callens Branch near Denver		2	R
WHI0070	Holman Creek below Huntsville		1	A
WHI0113	War Eagle Creek at county road bridge west of Highway 23		2	R
WHI0114	War Eagle Creek at Highway 412		2	R

Table A-64: Segment 4K Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0020010	FAYETTEVILLE, CITY OF	WHITE RV (001) & TRIB,MUD CK (002)	11010001	023	1
AR0021741	GREEN FOREST, CITY OF-WASTEWAT	TRIB,DRY CK,LONG CK,WHITE RV	11010001	055	2
AR0021792	BERRYVILLE, CITY OF	MILL BR,FREEMAN BR,OSAGE CK,KINGS RV	11010001	045	3
AR0021865	EUREKA SPRINGS, CITY OF	LEATHERWOOD CK,TABLE ROCK LK,WHITE	11010001	016	4
AR0022004	HUNTSVILLE, CITY OF	TOWN BR,HOLMAN CK,WAR EAGLE CK	11010001	959	5
AR0022373	WEST FORK, CITY OF	W FK/WHITE RV,WHITE RV,BEAVER LK	11010001	024	6
AR0033197	HERITAGE BAY HOMEOWNERS ASSN	BEAVER LK,WHITE RV	11010001	017	7
AR0036676	LOST BRIDGE VILLAGE WATER & SE	BEAVER LK, WHITE RV	11010001	017	8
AR0037249	HOLIDAY ISLAND SUBURBAN IMPROV	TABLE ROCK LK	11010001	016	9
AR0037320	MOUNT NE BEAVER LAKE CAMP	MONTE NE COVE,BEAVER LK	11010001	020	10
AR0040118	COUNTRY MOUNTAIN INN, INC	TRIB/KEELS CK,KINGS RV	11010001	039	11
AR0044059	CARROLL ELECTRIC COOP CORP	TRIB,CLABBER CK,KING RV,WHITE RV	11010001	037	12
AR0044300	TEYAR, LLC	LEATHERWOOD CK,TABLE ROCK LK,WHITE	11010001	016	13
AR0047619	CARROLL COUNTY STONE, INC	TRIB,WARDEN BR,OSAGE CK	11010001	045	14
AR0048844	OUTDOOR RESORTS OF THE OZARKS,	TABLE ROCK RSRV,IMPD/WHITE RV	11010001	006	15
AR0049191	CRICKET CREEK RV ESTATES	TABLE ROCK LK, WHITE RV	11010001	006	16
AR0049867	BEDFORD FALLS MOBILE HOME PARK	TRIB,OSAGE CK,KINGS RV,TABLE ROCK L	11010001	045	17

Figure A-43: West Fork White River (WHI0051) Turbidity

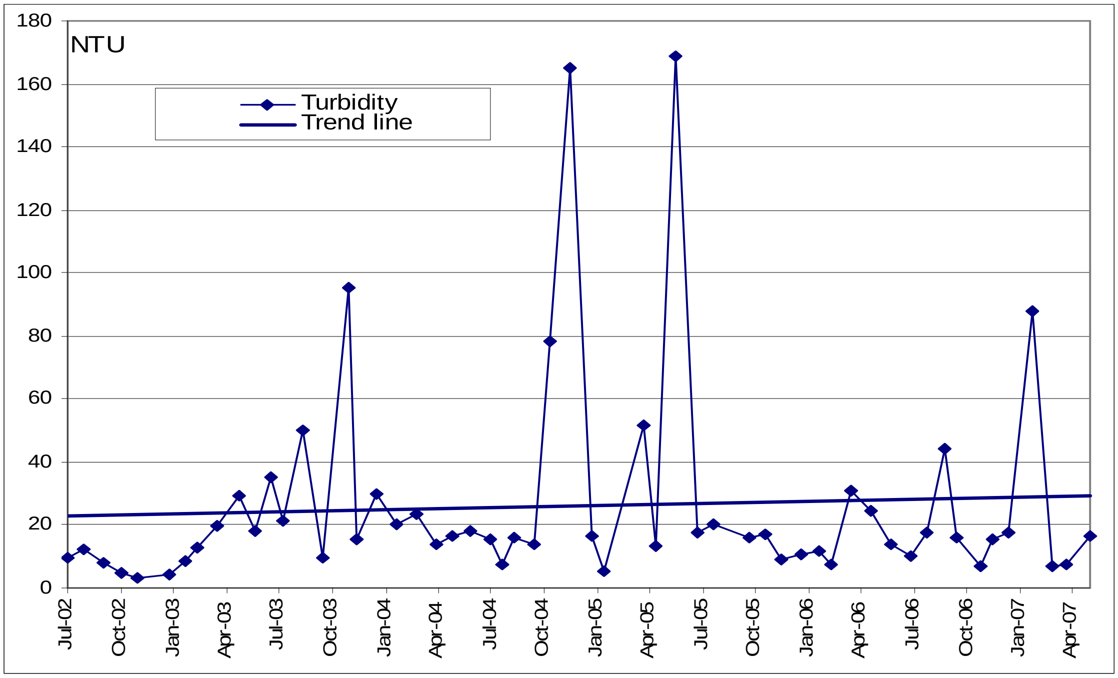
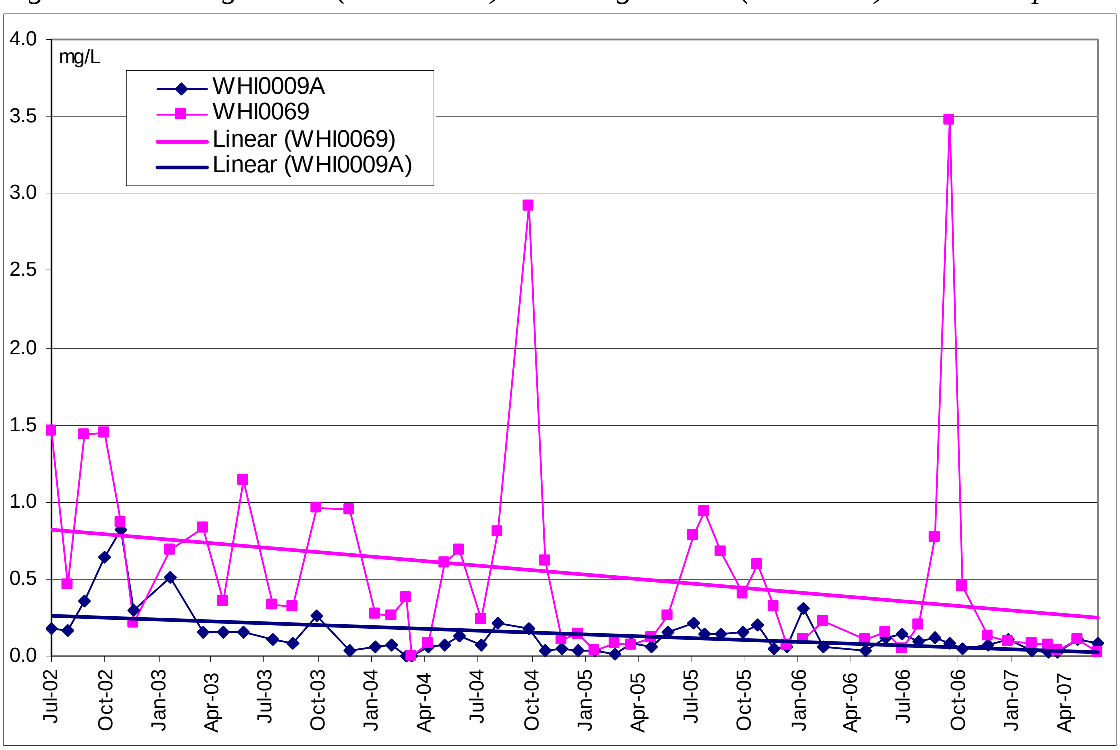


Figure A-44: Kings River (WHI0009A) and Osage Creek (WHI0069) Total Phosphorus



SEGMENTS 5A, 5B, 5C ST. FRANCIS RIVER BASIN

Segment 5A is located on the east central edge of Arkansas and covers parts of Crittenden, St. Francis, Lee, Poinsett, Craighead, Greene, Mississippi, Clay, and Cross Counties. This segment contains the St. Francis River and its tributaries; Fifteen Mile Bayou, Blackfish Bayou, and Tyronza River.

Segment 5B is located in northeast Arkansas and covers parts of Craighead, Poinsett, Cross, St. Francis, Woodruff, and Lee. This segment includes the entire 98-mile length of the L'Anguille River. The principal tributaries are Brushy Creek, First Creek, Second Creek, and Larkin Creek.

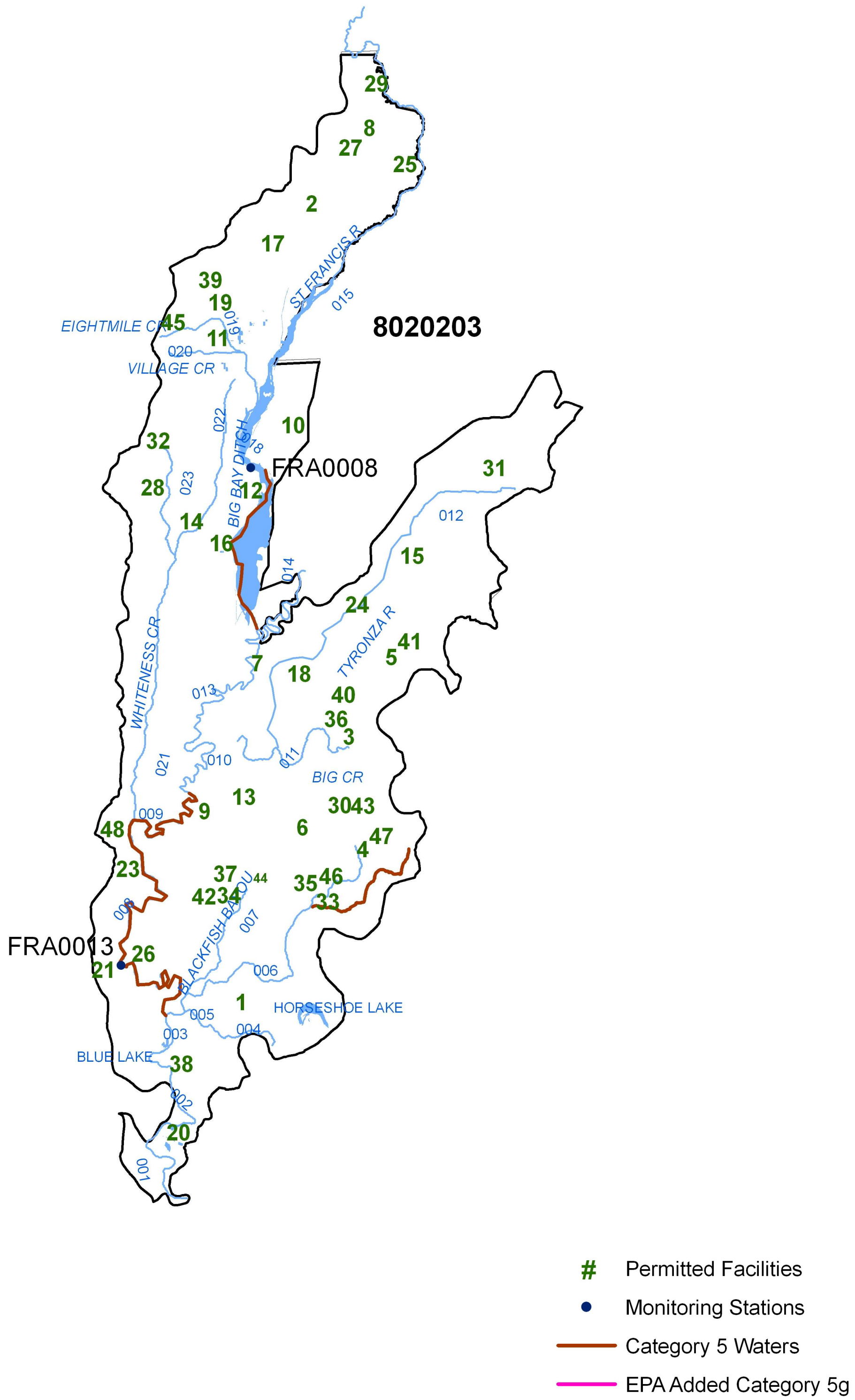
Segment 5C is located in the northeast corner of Arkansas and covers parts of Craighead, Mississippi, and Poinsett. This segment includes the Little River Basin and Pemiscot Bayou.

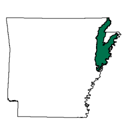
Summary of Water Quality Conditions

The waters within these segments have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. These three segments are discussed as one unit due to the consistent nature of the water quality. The overriding impact of land use on water quality can be seen in this segment. This basin contains 933.1 stream miles of which approximately 14 percent are designated as outstanding resources. Approximately 74 percent of the waters within this basin were assessed; 482.8 miles were monitored and 204.1 miles evaluated. The assessment concludes that essentially all of the streams within these segments have high turbidity and silt loads carried into the streams from row crop agriculture activities. This condition was encouraged by the drainage of lowland areas and by ditching and the channelization of streams to facilitate the runoff. The continuation of such activities and the continuous maintenance dredging of the ditches and streams aggravates and further deteriorates the conditions.

Because of the very high levels of turbidity during high flows and consistently elevated values during other flows, the entire length of the L'Anguille River was assessed as not supporting the aquatic life uses. A TMDL has been completed for siltation/turbidity in the L'Anguille River basin.

Figure A-45: Planning Segment 5A





(Segment 5A)

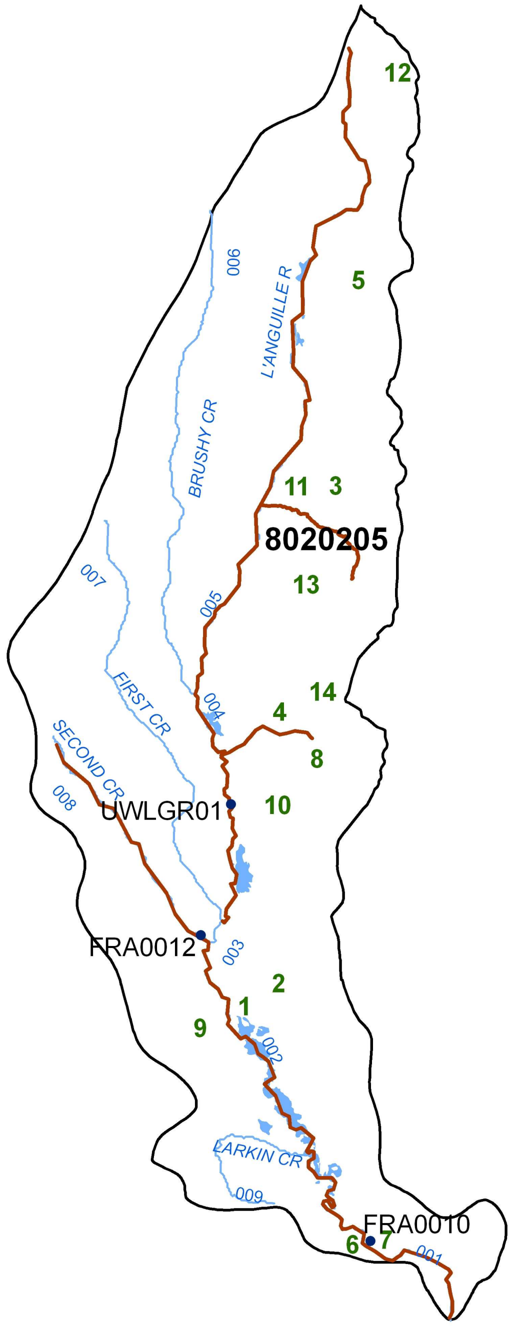
Table A-65: Planning Segment 5A—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-5A																										
St. Francis R.	8020203	-001	11.9		E	S	S	S	S	S	S									1				FISH CONSUMPTION	368.8	0
St. Francis R.	8020203	-002	25.5		E	S	S	S	S	S	S									1				AQUATIC LIFE	328.7	40.1
Blackfish Bayou	8020203	-003	2.4		E	S	S	S	S	S	S									1				PRIMARY CONTACT	368.8	0
Frenchmans B.	8020203	-004	14.5		E	S	S	S	S	S	S									1				SECONDARY CONTACT	368.8	0
Blackfish Bayou	8020203	-005	2.6		E	S	S	S	S	S	S									1				DRINKING SUPPLY	346	22.8
Fifteen Mile B.	8020203	-006	38.4	FRA0028	M	S	S	S	S	S	S									1				AGRI & INDUSTRY	273	95.8
Ten Mile Bayou[1]	8020203	-906	17.3	FRA0029	M	S	N	S	S	S	S	UN				DO				5f						
Blackfish Bayou	8020203	-007	16.1	FRA0027	M	S	S	S	S	S	S									1						
St. Francis R.	8020203	-008	55.9	FRA0013	M	S	S	S	S	S	N	AG				CL				5d						
St. Francis R.	8020203	-009	17.1		E	S	S	S	S	S	N	AG				CL				5d						
Tyronza River	8020203	-010	31.0	FRA0032	M	S	S	S	S	S	S									1						
Big Creek	8020203	-011	15.8		E	S	S	S	S	S	S									1						
Tyronza River	8020203	-012	50.0	FRA0033	M	S	S	S	S	S	S									1						
St. Francis R.	8020203	-013	47.5	FRA0036	M	S	S	S	S	S	S									1						
St. Francis R.	8020203	-014	22.8	FRA0008	M	S	N	S	S	N	N	UN	UN	UN		DO	CL	Be		5c	5d	5d				
St. Francis R.	8020203	-015	90.8		U															3						
Eightmile Ditch	8020203	-018	17.8		U															3						
Eightmile Ditch	8020203	-019	12.8		U															3						
Village Creek	8020203	-020	9.0		U															3						
Whiteness Cr.	8020203	-021	33.6		U															3						
Big Boy Creek	8020203	-022	24.2		U															3						
Whiteness Cr.	8020203	-023	15.0		U															3						
TOTAL MILES	572.0																									
MILES UNASSESSED	203.2																									
MILES EVALUATED	89.8																									
MILES MONITORED	279.0																									

1 Reach formally -006t

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
FRA0028	15 Mile Bayou at Simsboro Road near Proctor		2	R
FRA0029	10 Mile Bayou at Highway 147 near Edmondson		2	R
FRA0027	Blackfish Bayou at Highway 50 near Woldwood		2	R
FRA0013	St. Francis River at Highway 50 near Forrest City	Y	1	A
FRA0032	Tyronza River at Highway 184 near Earl		2	R
FRA0033	Tyronza River at Highway 133 near Tyronza		2	R
FRA0036	St. Francis River at Highway 140 at Marked Tree		2	R
FRA0008	St. Francis River at Highway 18 near Lake City	Y	1	A

Figure A-46: Planning Segment 5B



(Segment 5B)

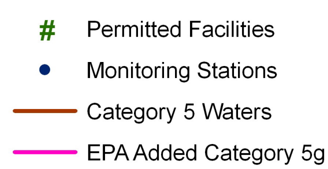


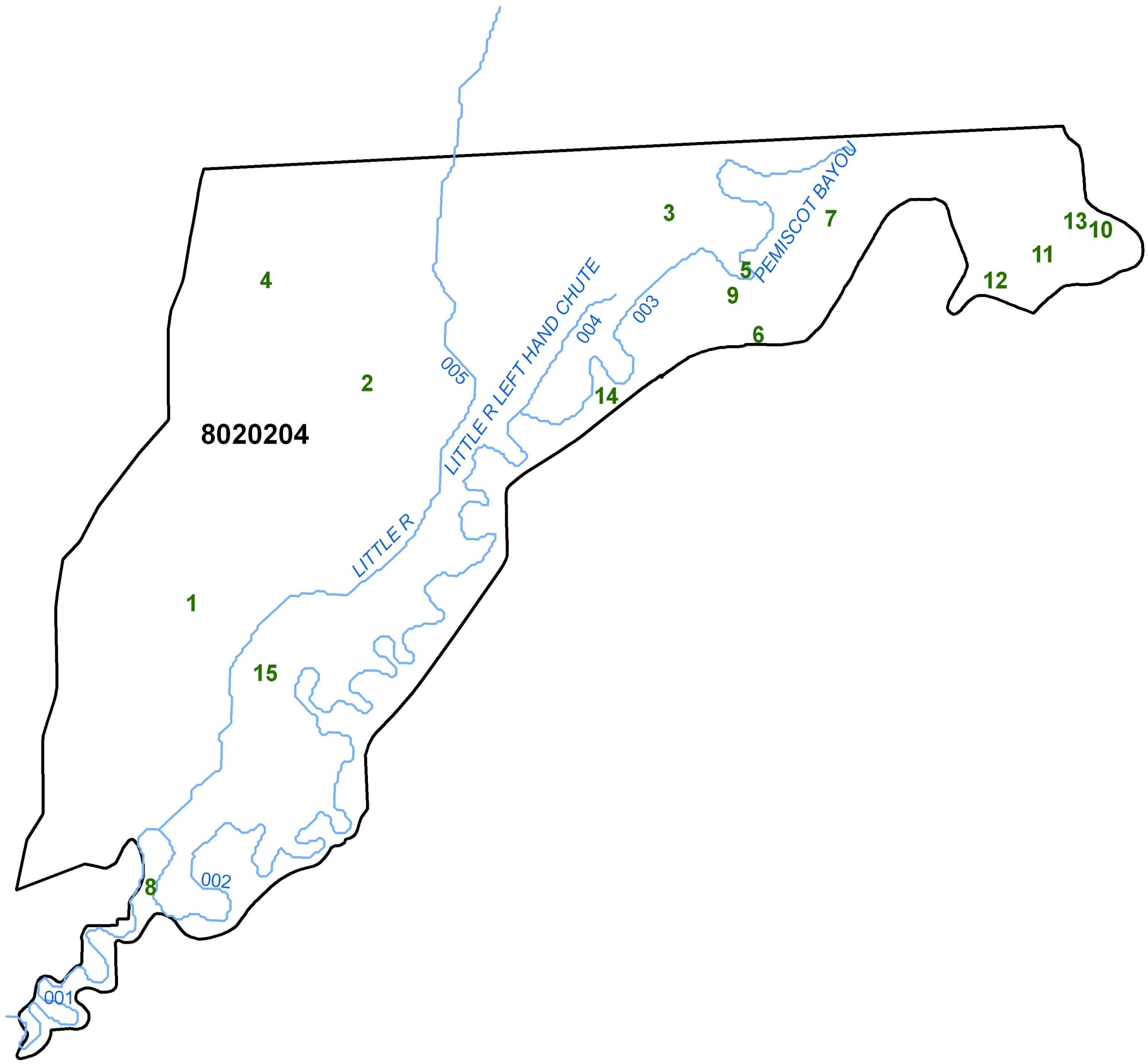
Table A-66: Planning Segment 5B—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-5B																										
L'Anguille R.	8020205	-001	19.7	FRA0010	M	S	N	S	S	S	N	AG	AG	UN	SE	CL	TDS	DO	SI	5a	5a	5f	4a	FISH CONSUMPTION	165.1	0
L'Anguille R.	8020205	-002	16.8		E	S	N	S	S	S	N	AG	AG	UN	SE	CL	TDS	DO	SI	5a	5a	5f	4a	AQUATIC LIFE	50.3	114.8
L'Anguille R.	8020205	-003	1.8		E	S	N	S	S	S	N	AG	AG	UN	SE	CL	TDS	DO	SI	5a	5a	5f	4a	PRIMARY CONTACT	105	60.1
Caney Creek	8020205	-901	9.0	FRA0034	M	S	S	S	S	S	N	MP				TDS				5b				SECONDARY CONTACT	165.1	0
L'Anguille R.	8020205	-004	16.0	UWLGR01	M	S	N	N	S	S	N	AG	UN	SE		1	DO	3		5a	5f	4a		DRINKING SUPPLY	151.7	13.4
L'Anguille R.	8020205	-005	44.1	UWLGR02	M	S	N	N	S	S	N	AG	UN	SE		2	DO	3		5a	5f	4a		AGRI & INDUSTRY	57.7	107.4
Prairie Creek	8020205	-902	13.4	FRA0035	M	S	S	S	S	N	S	AG	AG	AG		CL	SO4	TDS		5a						
Brushy Creek	8020205	-006	30.7		U															3						
First Creek	8020205	-007	27.9	FRA0030	M	S	S	S	S	S	S									1						
Second Creek	8020205	-008	16.4	FRA0012+	M	S	N	S	S	S	S	AG				DO				5c						
Larkin Creek	8020205	-009	12.3		U															3						
TOTAL MILES	208.1																									
MILES UNASSESSED	43.0																									
MILES EVALUATED	18.6																									
MILES MONITORED	146.5																									

1 = CL & TDS
2 = CL, SO4, & TDS
3 = SI & PA

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
FRA0010	L'Anguille River at Highway 50 near Marianna	Y	1	A
FRA0034	Caney Creek at Highway 305 near Wynne		2	R
UWLGR01	L'Anguille River at Highway 306 near Wynne		1	A
UWLGR02	L'Anguille River at Highway 214 west of Whitehall		2	R
FRA0035	Prairie Creek at Highway 1 north of Vanndale		2	R
FRA0030	First Creek near Horton		2	R
FRA0012	Second Creek on county road north of Palestine	Y	1	A
FRA0031	Second Creek at Highway 284 near Penrose		2	R

Figure A-47: Planning Segment 5C



(Segment 5C)

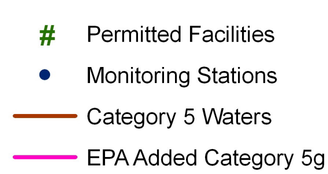


Table A-67: Planning Segment 5C—Designated Use Attainment Status and Water Quality Monitoring Stations

STREAM NAME	H.U.C.	RCH	MILES	STATION	ASSESS	FC	AL	PC	SC	DW	AI	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4	STATUS 1	STATUS 2	STATUS 3	STATUS 4	USE	SUPPORT	NOT SUPPORT
SEG-5C																										
Little River Left	8020204	-001	20.3	FRA0037	M	S	S	S	S	S	S									1				FISH CONSUMPTION	153.0	0.0
Little River	8020204	-002	61.7		E	S	S	S	S	S	S									1				AQUATIC LIFE	153.0	0.0
Pemiscot Bayou	8020204	-003	28.0		E	S	S	S	S	S	S									1				PRIMARY CONTACT	153.0	0.0
Little River	8020204	-004	6.0		E	S	S	S	S	S	S									1				SECONDARY CONTACT	153.0	0.0
Little River Right	8020204	-005	37.0	FRA0038	M	S	S	S	S	S	S									1				DRINKING SUPPLY	153.0	0.0
TOTAL MILES	153.0																							AGRI & INDUSTRY	153.0	0.0
MILES UNASSESSED	0.0																									
MILES EVALUATED	95.7																									
MILES MONITORED	57.3																									

Station Name	Station Location	Flow Gauge	Data Period	Monitoring Network
FRA00037	Left Hand Chute of Little River at Highway 140 near Lepanto		2	R
FRA00038	Right Hand Chute of Little River at Highway 135 at Riverdale		2	R

Table A-68: Segment 5A Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021547	HUGHES, CITY OF	CROOKED BU,MILLSEED LK,FRENCHMAN BU	08020203	004	1
AR0021911	RECTOR, CITY OF	DIT,POST OAK CK,BIG SLU,ST FRANCIS	08020203	015	2
AR0021954	TURRELL, CITY OF	BIG CK,TYRONZA RV,ST FRANCIS RV	08020203	011	3
AR0021971	MARION, CITY OF	15-MILE BU,BLACK FISH BU,ST FRANCIS	08020203	006	4
AR0022152	JOINER, CITY OF	DIT #4,FRENCHMAN'S BU,DIT #11,BELL	08020203	004	5
AR0022195	CRAWFORDSVILLE, CITY OF	ALLIGATOR BU	08020203		6
AR0033430	MARKED TREE, CITY OF-POND #2	ST FRANCIS RV	08020203	013	7
AR0033472	PIGGOTT, CITY OF	BIG SLOUGH DIT,ST FRANCIS RV	08020203	014	8
AR0033588	PARKIN, CITY OF	ST FRANCIS RV	08020203	009	9
AR0033651	MONETTE, CITY OF	LTL DIT #3,COCKEL BURR SL, ST FRANC	08020203		10
AR0033766	PARAGOULD, CITY LIGHT, WATER &	TRIB,8-MILE CK,ST FRANCIS RV	08020203	019	11
AR0034134	LAKE CITY, CITY OF	PURCELL SLU DIT #9, ST FRANCIS RV	08020203	014	12
AR0034304	EARLE, CITY OF	TYRONZA RV	08020203		13
AR0034312	BAY, CITY OF	DIT #6,MAIN DIT	08020203		14
AR0034754	KEISER, CITY OF	DTCH #31,TYRONZA RV,ST FRANCIS RV	08020203	012	15
AR0035602	TRUMANN, CITY OF-WWTP	DIT #60,ST FRANCIS RV	08020203	014	16
AR0035629	MARMADUKE, CITY OF	BIG SLOUGH DIT,ST. FRANCIS	08020203	015	17
AR0035637	TYRONZA, CITY OF	TYRONZA RV	08020203	012	18
AR0036790	GARLOCK RUBBER TECHNOLOGIES	JOHNSON CK,ST FRANCIS RV	08020203		19
AR0036897	USA-COE W.G. HUXTABLE PUMPING	ST FRANCIS RV	08020203	002	20
AR0037893	MADISON, CITY OF	ST FRANCIS RV	08020203	008	21
AR0037974	BROOKLAND, CITY OF	MAPLE SLU DIT TRIB	08020203	022	22
AR0038202	ARK PARKS VILLAGE CREEK	VILLAGE CK,CLARK CORNER CUTOFF,...	08020203	020	23
AR0039047	DYESS, CITY OF	TYRONZA RV,ST FRANCIS RV	08020203	012	24
AR0042196	NIMMONS, CITY OF	DIT,HAMPTON SLU,MAYO DIT,ST. FRANCI	08020203	015	25
AR0043087	WIDENER, CITY OF	ST FRANCIS RV	08020203	008	26
AR0043320	GREENWAY, CITY OF	BIG SLOUGH DIT TRIB	08020203	015	27
AR0043401	JONESBORO CITY WATER & LIGHT-E	WHITEMAN CK,LITL BAY DIT,DIT #9,#10	08020203	023	28
AR0043591	ST FRANCIS, CITY OF	ST FRANCIS RV	08020203	015	29
AR0044024	AMERICAS BEST CAMPGROUND; FRML	DIT,15-MILE BU,ST FRANCIS RV	08020203	006	30
AR0044237	BURDETTE, TOWN OF	DIT #24,#31,#6,TYRONZA RV,ST FRANCI	08020203	012	31
AR0044521	HERITAGE HILLS MOBILE HOME PAR	LATERAL #1,#2,LTL BAY DTCH,#10,#23	08020203	023	32
AR0044661	EDMONDSON, CITY OF	15-MILE BU,BLACKFISH BU,ST FRANCIS	08020203	006	33
AR0044695	SUPER 8 MOTEL	SHELL LK,BLACKFISH BU,15 MI BU	08020203	007	34
AR0044890	NIMOCKS OIL COMPANY, INC.	TRIB,15-MILE BU,ST FRANCIS RV	08020203	006	35
AR0045021	GILMORE, CITY OF	LTL CYPRESS DIT,BIG CK,GIBSON BU	08020203	011	36
AR0045403	WEST MEMPHIS TRAVEL CENTER, FR	BLACKFISH BU,ST FRANCIS RV	08020203	007	37
AR0045578	EAST ARK CORRECTIONAL FACILITY	ST FRANCIS RV (NEAR ALLIGATOR BU)	08020203	002	38
AR0045837	OAK GROVE HEIGHTS SEWER	TRIB,LOCUST CK,8-MILE DIT	08020203		39
AR0045934	BIRDSONG, CITY OF	SNAKE LK,LAMB BU,DIT#1,LTL CYPRESS	08020203	011	40
AR0046272	BASSETT, CITY OF	DIT #5 TRIB	08020203	012	41
AR0046761	MAPCO EXPRESS, INC #3155	TRIB,BLAKFISH BU,ST FRANCIS RV	08020203	007	42
AR0047490	FAST MARKET	DIT,15-MILE BU,ST FRANCIS RV	08020203	006	43
AR0048151	JENNETTE, TOWN OF	BLACKFISH BU,ST FRANCIS RV	08020203	007	44

AR0049841	CROWLEY'S RIDGE COLLEGE	TRIB,8-MILE CK,ST FRANCIS RV	08020203	019	45
AR0050121	PJ'S COUNTRY STORE	DIT,DIT #11,15-MILE BU,ST FRANCIS R	08020203	006	46
AR0050164	MAPCO EXPRESS #3058	SW DRAIN,TRIB,MISSISSIPPI	08020203		47
AR0050423	COLLIER RENTALS, LLC	TRIB,COPPERAS CK,ST FRANCIS RV	08020203		48

Table A-69: Segment 5B Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0000370	ENTERGY-HAMILTON MOSES PLANT	TRIB,L'ANGUILLE RV	08020205	002	1
AR0020087	FORREST CITY, CITY OF	TRIB,L'ANGUILLE RV,ST FRANCIS RV	08020205	002	2
AR0021393	CHERRY VALLEY, CITY OF	COPPER CK,WOLF CK,L'ANGUILLE RV	08020205	005	3
AR0021903	WYNNE, CITY OF	DIT,CANEY,CK,L'ANGILLE RV	08020205	004	4
AR0033863	HARRISBURG, CITY OF	TOWN CK,LTRL T,HOLLOW BR,L'ANGUILLE	08020205	005	5
AR0034142	MARIANNA, CITY OF-POND B	L'ANGUILLE RV,ST FRANCIS RV	08020205	001	6
AR0034169	MARIANNA, CITY OF-POND A	L'ANGUILLE RV,ST FRANCIS RV	08020205	001	7
AR0038679	ANDREWS TRAILER PARK	BEAR CK,CANEY CK,L'ANGUILLE RV	08020205	901	8
AR0039365	PALESTINE, CITY OF	L'ANGUILLE RV	08020205	002	9
AR0043192	COLT, CITY OF	TAYLOR CK DIT,L'ANGUILLE RV	08020205	004	10
AR0044041	CROSS COUNTY HIGH SCHOOL	COOPER CK,L'ANGUILLE RV,ST FRANCIS	08020205		11
AR0048658	HUNTERS GLEN OWNERS ASSOCIATIO	CK,DIT #1,MULLIGAN LTRL,L'ANGUILLE	08020205	005	12
AR0049409	VANNDALE BIRDEYE WATER	LANGUILLE RV	08020205	015	13
AR0049476	MUELLER COPPER TUBE PRODUCTS	DIT,INDIAN CK,CANEY CK,L'ANGUILLE R	08020205	004	14

Table A-70: Segment 5C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0020028	CARAWAY, CITY OF	DIT,ASHER DIT,DIT #4	08020204	005	1
AR0021881	MANILA, CITY OF	DIT #81,LITTLE RV,ST. FRANCIS RV	08020204	005	2
AR0021962	GOSNELL, CITY OF	DIT 29,PEMISCOT BU	08020204	003	3
AR0022012	LEACHVILLE, CITY OF	HONEY CYPRESS DIT,BUFFALO CK DIT	08020204	005	4
AR0022560	BLYTHEVILLE, CITY OF-WEST WWTF	DIT #27,LITTLE RIVER,ST FRANCIS RV	08020204	003	5
AR0022578	BLYTHEVILLE, CITY OF-SOUTH TRE	DIT #17 TRIB,DIT #6,DIT #1,ST FRANC	08020204	003	6
AR0022586	BLYTHEVILLE, CITY OF-NORTH	TRIB,DIT #30,DIT #27,L CHUTE,LT RV	08020204	003	7
AR0023841	LEPANTO, CITY OF	LEFT HAND CHUTE,LITTLE RV	08020204	001	8
AR0044181	WHEEL ACRES	DIT #36 TRIB,PEMISCOT BU	08020204	003	9
AR0045977	NUCOR STEEL-ARKANSAS	DIT,CROOKED LAKE BU,PEMISCOT BU	08020204	003	10
AR0046523	MAVERICK TUBE CORP	DIT #38,CROOKED BU,PEMISCOT BU	08020204	003	11
AR0046663	AIR LIQUIDE LARGE INDUSTRIES,	DIT,DIT 14A,DIT 13,DIT 31,TYRONZA R	08020204	003	12
AR0049166	IPSCO TUBULARS, INC	DIT,DIT #42,CROOKED LAKE BU	08020204	003	13
AR0049425	ASSOC.ELEC.CO-OP,INC.AECI/DELL	DIT #27,DIT #6,TYRONZA RV,ST FRANCI	08020204	003	14
AR0050741	ETOWAH, CITY OF/LAGOON SYSTEM	RIGHT HAND CHUTE/LITTLE RV FLOODWAY	08020204		15

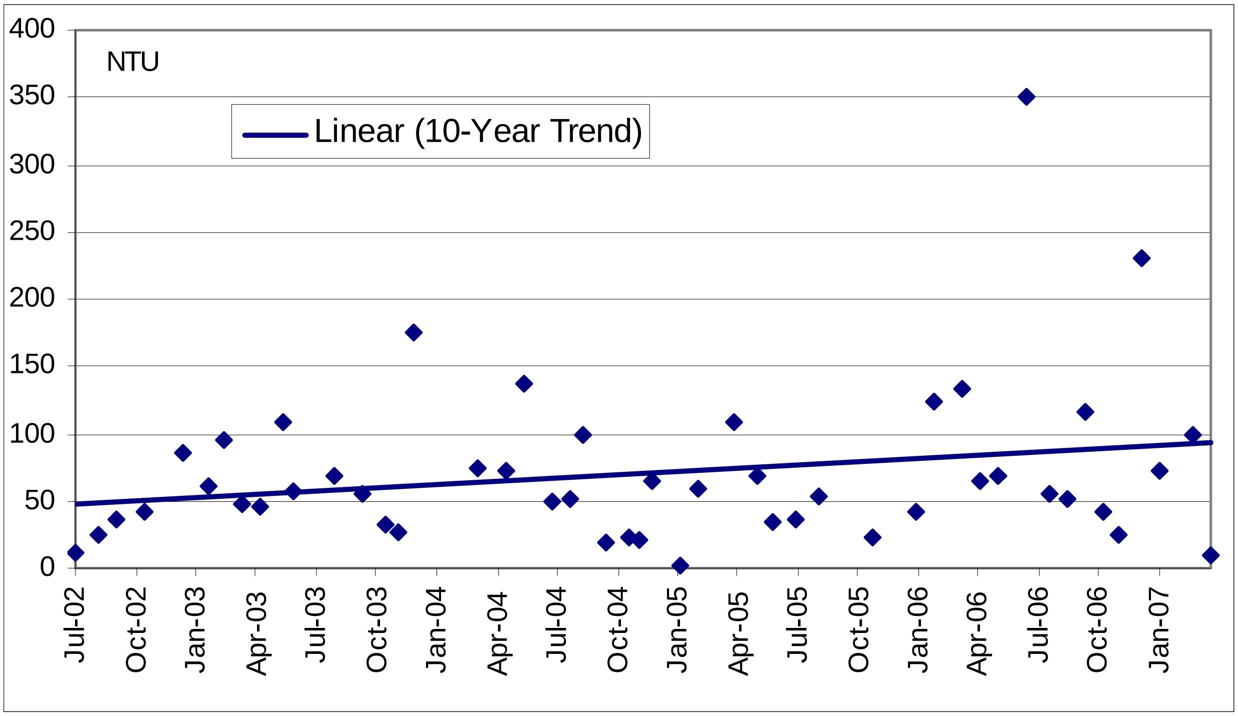
Table A-71: UWLGR01 L'Anguille River at Hwy 306 3 Mi. W. of Colt, AR

Parameter	Valid Data Points	Mean	Minimum	Maximum	Standard Deviation
Dissolved Oxygen (mg/L)	52	6.03	0.90	11.80	2.26
BOD_5 (mg/L)	46	1.91	0.60	6.26	1.12
pH (standard units)	51	7.11	3.99	8.12	0.77
Total Organic Carbon (mg/L)	46	8.42	4.99	18.98	2.50
Ammonia as N (mg/L)	52	0.10	0.01	0.83	0.12
NO_2 + NO_3 as N (mg/L)	52	0.29	0.02	1.32	0.26
Orthophosphate as P (mg/L)	52	0.11	0.04	0.20	0.03
Total Phosphorus as P (mg/L)	51	0.23	0.11	0.92	0.11
Total Hardness (mg/L)	22	130.36	25.00	277.00	80.12
Chloride (mg/L)	53	17.76	2.37	65.28	13.35
Sulfate (mg/L)	53	13.64	3.63	38.31	9.00
Total Dissolved Solids (mg/L)	52	212.03	114.00	440.00	83.82
Total Suspended Solids (mg/L)	52	25.97	3.50	114.00	19.67
Turbidity (NTU)	53	50.77	4.54	162.00	37.85

Table A-72: UWLGR02 L'Anguille River at Hwy 214, 3 Mi. W. of Whitehall, AR

Parameter	Valid Data Points	Mean	Minimum	Maximum	Standard Deviation
Dissolved Oxygen (mg/L)	47	5.36	1.65	11.5	2.29
BOD_5 (mg/L)	45	4.01	1.54	16.9	2.54
pH (standard units)	46	7.43	5.24	8.53	0.57
Total Organic Carbon (mg/L)	43	10.04	5.76	23.74	3.67
Ammonia as N (mg/L)	48	0.22	0.01	3.53	0.51
NO_2 + NO_3 as N (mg/L)	48	0.18	0.01	1.01	0.20
Orthophosphate as P (mg/L)	48	0.14	0.02	1.27	0.19
Total Phosphorus as P (mg/L)	48	0.32	0.10	1.39	0.22
Total Hardness (mg/L)	22	117.91	49.00	313.00	67.30
Chloride (mg/L)	48	18.44	4.72	45.90	12.03
Sulfate (mg/L)	48	26.71	3.82	134.00	25.53
Total Dissolved Solids (mg/L)	47	218.89	106.00	429.50	77.85
Total Suspended Solids (mg/L)	47	55.51	5.00	419.00	66.19
Turbidity (NTU)	48	84.00	2.80	660.00	99.97

Figure A-48: L’Anguille River (FRA0010) Turbidity 10-Year Trend



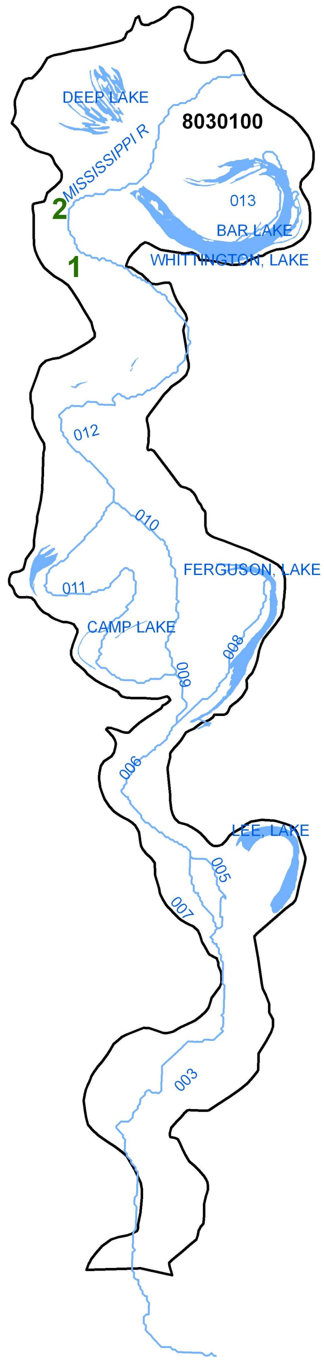
SEGMENTS 6A, 6B, 6C MISSISSIPPI RIVER BASIN

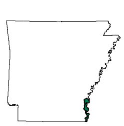
These three segments comprise the Mississippi River Basin, which consists of a 437 mile reach of the Mississippi River. It is levied throughout its total length within the State. Segment 6A contains a 129.9-mile reach of the Mississippi from its confluence with the Arkansas River to the Arkansas-Louisiana state line. No surface drainage enters this reach below the Arkansas River except from the Lake Chicot pumping plant on Macon Bayou. Segment 6B consists of a 137.2-mile reach of the Mississippi from its confluence with the St. Francis River to the confluence with the Arkansas River. All drainage from the Arkansas and the White River Basins reaches the Mississippi River at the lower end of this reach. Segment 6C is a 174.4-mile reach of the Mississippi from the Arkansas-Missouri state line to its confluence with the St. Francis River. All surface drainage from the St. Francis River Basin within Arkansas enters the Mississippi River via the St. Francis River at the end of this reach.

Summary of Water Quality Conditions

The waters within these segments have been designated as suitable for the propagation of fish/wildlife, primary and secondary contact recreation, and public, industrial, and agricultural water supplies. These three segments include 437 miles of the Mississippi River. No recent data was available to assess the Mississippi River; however, USGS Circular 1133 provides an extensive review of the Mississippi River water quality from 1987-92. For this report all waters of the Mississippi River adjacent to Arkansas are listed as unassessed. However, most of the water contributed to the Mississippi River from Arkansas is from the White and Arkansas River Basins, both of which are assessed as meeting all designated uses in their lower segments prior to flowing into the Mississippi River.

Figure A-49: Planning Segment 6A

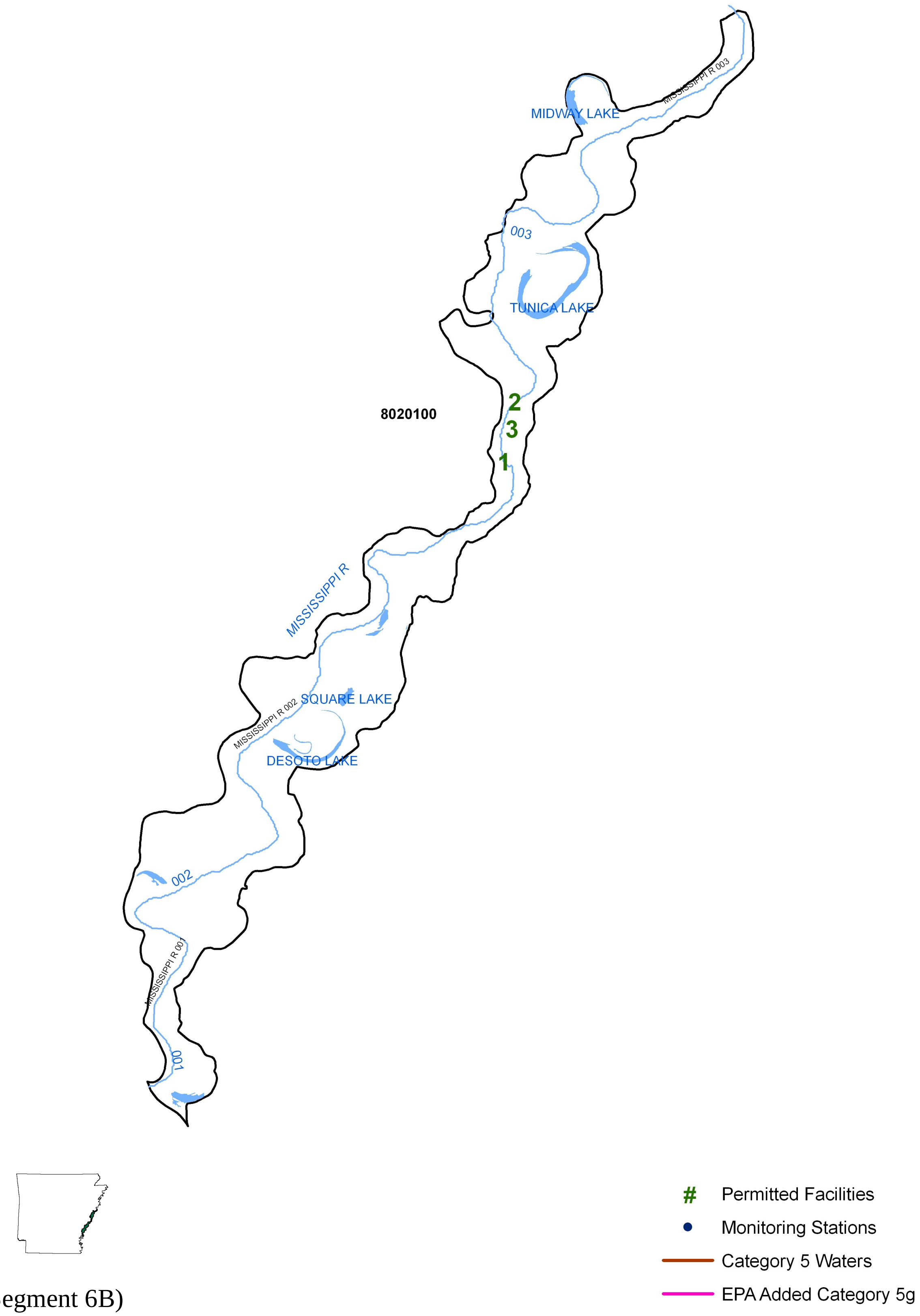




(Segment 6A)

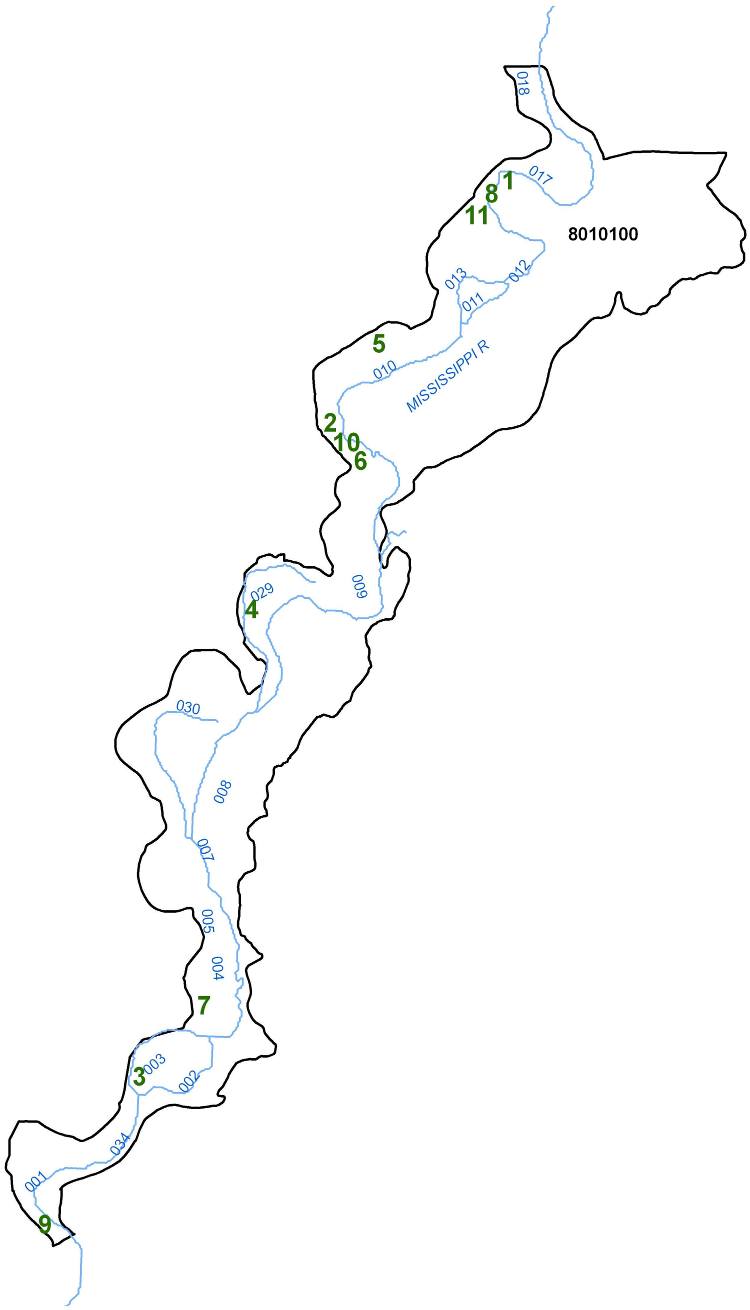
Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

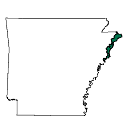
Figure A-50: Planning Segment 6B



(Segment 6B)

Figure A-51: Planning Segment 6C





(Segment 6C)

Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

Table A-73: Planning Segment 6A, 6B, 6C—Designated Use Attainment Status

				1	2	3	4	1	2	3	4	1	2	3	4			
SEG-6																		
Mississippi R.	8010100 -001	6.2	U									3				FISH CONSUMPTION	0	0
Mississippi R.	8010100 -002	7.8	U									3				AQUATIC LIFE	0	0
Mississippi R.	8010100 -003	8.6	U									3				PRIMARY CONTACT	0	0
Mississippi R.	8010100 -004	4.8	U									3				SECONDARY CONTACT	0	0
Mississippi R.	8010100 -005	4.8	U									3				DRINKING SUPPLY	0	0
Mississippi R.	8010100 -007	2.3	U									3				AGRI & INDUSTRY	0	0
Mississippi R.	8010100 -008	10.1	U									3						
Mississippi R.	8010100 -009	19.4	U									3						
Mississippi R.	8010100 -010	24.3	U									3						
Mississippi R.	8010100 -011	4.8	U									3						
Mississippi R.	8010100 -012	4.0	U									3						
Mississippi R.	8010100 -013	5.8	U									3						
Mississippi R.	8010100 -017	16.8	U									3						
Mississippi R.	8010100 -018	43.6	U									3						
Mississippi R.	8010100 -034	6.6	U									3						
Mississippi R.	8020100 -001	18.0	U									3						
Mississippi R.	8020100 -002	76.1	U									3						
Mississippi R.	8020100 -003	43.1	U									3						
Mississippi R.	8030100 -003	56.6	U									3						
Mississippi R.	8030100 -005	4.7	U									3						
Mississippi R.	8030100 -006	8.9	U									3						
Mississippi R.	8030100 -007	3.8	U									3						
Mississippi R.	8030100 -009	2.6	U									3						
Mississippi R.	8030100 -011	19.2	U									3						
Mississippi R.	8030100 -012	34.1	U									3						
TOTAL MILES	437.0																	
MILES UNASSESSED	437.0																	
MILES EVALUATED	0.0																	
MILES MONITORED	0.0																	

Table A-74: Segment 6A, 6B, 6C Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number	Segment
AR0035751	ARKANSAS CITY, CITY OF	MISSISSIPPI RV	08030100		1	6A
AR0035823	POTLATCH FOREST PRODUCTS CORP	MISSISSIPPI RV	08030100		2	6A
AR0000388	ENTERGY-RITCHIE PLANT	MS RV (1,2,3)-6B/LONG LK BU(4,5)-4A	08020100	002	1	6B
AR0022021	WEST HELENA WATER UTILITIES	MISSISSIPPI RV	08010100	002	2	6B
AR0043389	HELENA, CITY OF	MISSISSIPPI RV	08020100	002	3	6B
AR0000361	KINDER MORGAN OPERATING L.P.	MISSISSIPPI RV (1) & DIT #47 (2)	08010100	017	1	6C
AR0021580	OSCEOLA, CITY OF	MISSISSIPPI RV	08010100	010	2	6C
AR0022039	WEST MEMPHIS, CITY OF-WWTP	MISSISSIPPI RV	08010100	003	3	6C
AR0022314	WILSON, CITY OF	SLU,ISLAND #35 CHUTE,MISSISSIPPI RV	08010100		4	6C
AR0033782	LUXORA, CITY OF	MISSISSIPPI RV	08010100	010	5	6C
AR0036544	VISKASE COMPANIES, INC.	MS RV-6C (1)/BIG SANDY SLU-5A (2,3)	08010100		6	6C
AR0037770	CIBA SPECIALTY CHEMICALS WATER	MISSISSIPPI RV	08010100	031	7	6C
AR0043117	NUCOR-YAMATO STEEL	MISSISSIPPI-6C (1,3)/DIT #14A-5A(2)	08010100	017	8	6C
AR0049531	HORSESHOE LAKE WWT FACILITY	MISSISSIPPI RV	08010100		9	6C
AR0049557	DYNEGY SVC'S. PLUM POINT, LLC	MISSISSIPPI RV	08010100	010	10	6C
AR0050083	MARINE TERMINALS OF ARKANSAS,	MISSISSIPPI RV	08010100	017	11	6C

APPENDIX B AMBIENT GROUND WATER MONITORING PROGRAM DATA

The following tables list data specific to each monitoring area sampled during the Federal Fiscal years 1997 through 2006. The tables identify sampling locations for each monitoring area and list descriptive statistics for each monitoring area. Volatile organic compounds and semi-volatile compounds (including pesticides) detected in a particular monitoring area during the referenced period are discussed in Part V of this report. Most of the tables contain spaces occupied by a single dash, which represent unavailable data for that monitoring area. For statistical analyses (mean calculation), a value of one half the detection limit was used in cases where the value is displayed as "less than" the detection limit.

The following abbreviations are used in the Sampling Locations tables:

NA	Not Applicable
S	Spring
W	Well
C/I	Commercial/Industrial
D	Domestic
I	Irrigation
M	Municipal
St	Stock
U	Unused
NT	Not Tested (not analyzed for specified parameter)

The following chemical abbreviations are used in the Selected Descriptive Statistics tables:

TDS	Total Dissolved Solids	Cl	Chloride
HCO_3	Bicarbonate	Fe	Iron
NH_3 -N	Ammonia-Nitrogen	F	Fluoride
NO_3 -N	Nitrate-Nitrogen	K	Potassium
O-Phos	Ortho-Phosphate	Mg	Magnesium
T-Phos	Total Phosphorous	Mn	Manganese
SO_4	Sulfate	Na	Sodium
Ba	Barium	SiO_2	Silica
Ca	Calcium		

Table B-1: Brinkley Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
MON103	06/27/05	03N02W08ABB2	34.89651	-91.23214	60	Alluvial	D
MON116	06/28/05	03N02W10CCC3	34.88196	-91.20510	160	Alluvial	I
MON121	06/27/05	03N02W22ACC1	34.86196	-91.19552	65	Alluvial	I
MON122	06/27/05	03N02W23CDC2	34.85398	-91.18457	100	Alluvial	D
MON129	06/27/05	03N02W27DAC1	-		90	Alluvial	D
MON162	06/28/05	04N02W22DAD1	34.94374	-91.18855	-	Alluvial	I
MON304	06/28/05	04N02W14CDC3	34.95497	-91.18169	110	Alluvial	D
MON310	06/27/05	02N02W14ACB2	34.78990	-91.18096	140	Alluvial	I
MON315	06/28/05	04N02W28DDD1	34.92682	-91.20553	~120	Alluvial	I
MON318	06/28/05	04N02W28DAC	34.92989	-91.20776	121	Alluvial	I
MON324	06/27/05	02N02W34ACB2	34.74596	-91.20084	-	Alluvial	I
MON325	06/28/05	02N03W35ADD3	34.74643	-91.28356	-	Alluvial	I
MON326	06/27/05	02N03W26DDA2	34.75554	-91.28327	-	Alluvial	I
MON328A	06/27/05	-	34.80879	-91.18743	-	Alluvial	I
MON329	06/27/05	03N01W19BAB2	34.86666	-91.14872	80	Alluvial	D
MON330A	06/27/05	-	34.81795	-91.11884	-	Alluvial	I
MON331	06/27/05	03N01W33BCC2	34.83165	-91.11761	100	Alluvial	I
MON333	06/27/05	-	34.78815	-91.24224	-	Alluvial	I
MON335	06/27/05	02N02W06AAC1	34.82232	-91.24565	-	Alluvial	I
MON900	06/28/05	03N02W16AAC3	34.87860	-91.20970	-	Alluvial	I
MON902	06/28/05	02N02W07DDA4	34.79720	-91.24400	-	Alluvial	I
MON903	06/27/05	02N02W07DCD4	34.79540	-91.24830	-	Alluvial	I
MON904	06/27/05	02N02W17ACC4	34.78780	-91.23330	-	Alluvial	I
MON906	06/28/05	04N02W27ABC3	34.93680	-91.19560	-	Alluvial	I
MON907	06/28/05	-	34.92905	-91.19377	-	Alluvial	I
MON909	06/28/05	-	34.93818	-91.25406	-	Sparta	P
MON910	06/27/05	02N02W14AAB1	34.79390	-91.17610	-	Alluvial	I
MON911	06/28/05	02N02W15BAB2	34.79470	-91.20340	-	Alluvial	I
MON920	06/27/05	-	-	-	-	Alluvial	I

Table B-2: Brinkley Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
MON103	7.24	945	553	293	357.5	-	<0.010	0.015	-	15.3	190	66.3	125	3860	0.39	1.79	21.7	296	94.8	37.2
MON116	7.43	828	529	389	474.6	-	<0.010	0.012	-	36.3	260	106	35	2660	0.29	2.1	30.4	303	33.7	39.7
MON121	7.21	1030	639	394	480.7	-	<0.010	0.012	-	55.4	360	120	81	2800	0.32	2.26	33.1	308	53.5	33.7
MON122	7.22	1050	656	428	522.2	-	<0.010	0.014	-	52.2	361	141	69	3340	0.31	2.39	36.9	292	36.6	30.7
MON129	7.74	933	532	235		-	0.096	0.259	-	1.47	32.4	4.59	177	<20	1.02	1.74	0.925	1.11	200	16.3
MON162	7.32	562	356	285	347.7	-	<0.010	0.019	-	3.67	163	76	22	1270	0.3	1.87	19	373	19.1	35.7
MON304	7.19	917	609	351	428.2	-	0.164	0.105	-	107	131	93.8	55	289	0.34	1.4	29.3	363	86.5	29.8
MON310	7.36	1220	722	409	499.0	-	<0.010	0.014	-	53.6	250	108	140	2780	0.31	2.61	35.3	361	94.5	30.3
MON315	7.43	1820	1030	385	469.7	-	<0.010	0.042	-	5.73	302	60.5	357	1650	0.38	5.95	15.5	222	279	27.8
MON318	7.6	1030	622	349	425.8	-	<0.010	0.506	-	14	175	35.3	123	853	1.71	3.71	8.96	108	202	23.6
MON324	7.34	769	506	335	408.7	-	<0.010	0.014	-	69.1	508	98.4	23	4130	0.29	3.02	27.6	810	21.4	46.5
MON325	7.37	732	482	232	283.0	-	<0.010	0.016	-	65.3	569	87.5	61	5860	0.25	2.48	19	1080	28	40.6
MON326	7.39	870	537	289	352.6	-	<0.010	0.013	-	70.7	657	114	73	4500	0.23	3.79	27.1	666	23.4	38.8
MON328A	7.3	1460	867	444	541.7	-	0.018	0.016	-	50.3	293	115	214	3520	0.31	3.5	34.5	444	155	29.7
MON329	7.14	759	475	358	436.8	-	<0.010	0.013	-	34.5	270	101	27	3170	0.26	0.976	28.6	356	23.5	36.2
MON330A	7.22	958	623	405	494.1	-	<0.010	0.012	-	104	421	122	30	4410	0.29	2.8	35.5	546	39.3	34.1
MON331	7.29	730	455	378	461.2	-	<0.010	0.014	-	28	227	99.3	14	1880	0.24	1.93	26.7	370	26.7	34.3
MON333	7.19	2550	1400	442	539.2	-	<0.010	0.012	-	18.5	1110	178	535	7970	0.24	6.93	49.4	331	261	34.5
MON335	7.43	678	417	279	340.4	-	<0.010	0.016	-	32.9	329	77.1	41	2980	0.3	1.99	23.1	219	31.6	32.2
MON900	7.6	948	609	414	505.1	-	<0.010	0.014	-	67.9	308	118	46	3070	0.29	2.29	34.3	367	41.4	37.2
MON902	7.43	1790	1040	427	520.9	-	<0.010	0.014	-	52.1	709	133	317	5480	0.3	4.3	41.2	367	186	33.3
MON903	7.26	2170	1220	438	534.4	-	<0.010	0.012	-	26.1	764	147	442	6460	0.28	5.4	40.7	338	250	34.6
MON904	7.22	2400	1330	438	534.4	-	<0.010	0.012	-	28.9	1150	200	506	8540	0.24	5.99	58.1	389	240	38.1
MON906	-	NA	417	338	412.4	-	<0.010	0.041	-	7.41	173	62.7	21	1260	0.27	2.56	16.7	312	64.6	32.3
MON907	7.44	1360	797	375	457.5	-	<0.010	0.054	-	14.2	236	73.1	187	996	0.32	3.19	19.4	338	212	33.9
MON909	8.1	790	461	219	267.2	-	<0.010	0.445	-	1.54	35.9	2.87	121	69.4	0.73	1.74	0.696	4.12	183	19.3
MON910	7.36	1940	1190	483	589.3	-	<0.010	0.015	-	146	249	155	286	3470	0.32	3.45	48.3	417	225	33.7
MON911	7.32	2350	1300	446	544.1	-	<0.010	0.012	-	43.9	519	190	493	6110	0.23	4.47	59.3	611	224	30.5
MON920	7.29	1070	690	390		-	<0.010	0.013	-	103	320	117	75.5	2780	0.29	2.87	37.3	403	55.7	35.2
Min.	7.14	562	356	219	267.2	-	<0.010	0.012	-	1.47	32.4	2.87	14	69.4	0.23	0.976	0.696	4.12	19.1	16.3
Max.	8.10	2550	1400	483	589.3	-	0.164	0.506	-	146	1150	200	535	8540	1.71	6.93	59.3	1080	279	46.5
Mean	7.37	1238	726.3	367	447.9	-	0.014	0.061	-	45.14	381.8	103.5	161.9	3434	0.38	3.08	29.6	379.2	116.9	33.1

Table B-3: Chicot Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
CHI001	07/08/97	16S03W32BCB1	33 16' 44.6"	91 26' 31.6"	-	Alluvial	I
CHI002	07/08/97	16S03W34BBB1	33 16' 14.7"	91 24' 27.9"	-	Alluvial	D
CHI003	07/08/97	16S03W27ADD1	33 16' 46.3"	91 23' 30.5"	-	Alluvial	D
CHI004	07/07/97	17S03W33BBA1	33 11' 00.9"	91 25' 11.0"	-	Alluvial	I
CHI005	07/08/97	18S03W16CDD1	33 07' 37.0"	91 24' 54.8"	-	Alluvial	I
CHI008	07/08/97	17S03W15DAD1	33 13' 03.7"	91 23' 24.2"	-	Alluvial	I
CHI009	07/07/97	17S03W28ACD1	33 11' 26.6"	91 24' 41.3"	-	Alluvial	I
CHI010	07/07/97	16S02W08DDC1	33 18' 56.2"	91 19' 26.3"	-	Alluvial	I
CHI011	07/07/97	16S03W11ADC1	33 19' 19.3"	91 22' 33.4"	-	Alluvial	I
CHI012	07/07/97	16S03W15CDD1	33 18' 01.4"	91 23' 57.7"	-	Alluvial	I
CHI013	07/07/97	16S03W05BCA1	33 20' 22.9"	91 26' 15.9"	-	Alluvial	I
CHI014	07/07/97	17S03W16BBB1	33 13' 36.7"	91 25' 27.0"	-	Alluvial	I
CHI015	07/07/97	17S03W09AAA1	33 14' 30.1"	91 24' 29.6"	-	Alluvial	I
CHI016	07/07/97	16S03W25CAC1	33 16' 28.4"	91 22' 01.5"	-	Alluvial	I
CHI017	07/08/97	17S03W10AAD1	33 14' 20.4"	91 23' 23.7"	-	Alluvial	I
CHI018	07/08/97	16S03W35CAB1	33 15' 45.7"	91 23' 09.7"	-	Alluvial	I
CHI019	07/08/97	17S03W03AAB1	33 15' 19.8"	91 23' 31.0"	-	Alluvial	I
CHI020	07/08/97	16S03W20BCD1	33 17' 37.7"	91 26' 17.9"	-	Alluvial	I
CHI021	07/08/97	17S03W20AAD1	33 12' 32.9"	91 25' 27.1"	-	Alluvial	I
CHI022	07/08/97	17S03W32BBC1	33 10' 54.8"	91 26' 28.9"	-	Alluvial	I
CHI023	07/08/97	17S03W06DCC1	33 14' 34.2"	91 27' 00.3"	-	Alluvial	I
CHI024	07/08/97	18S03W14BBC1	33 08' 14.6"	91 23' 21.7"	-	Alluvial	I
CHI025	07/08/97	18S03W08DCC1	33 08' 26.6"	91 25' 56.3"	-	Alluvial	I
CHI026	07/08/97	18S03W08AAD1	33 09' 05.8"	91 25' 31.5"	-	Alluvial	I
CHI027	07/08/97	18S03W11CBD1	33 08' 39.8"	91 23' 12.6"	-	Alluvial	I
CHI028	07/08/97	17S03W35CCD1	33 10' 11.0"	91 23' 05.7"	-	Alluvial	I

Table B-4: Chicot Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
CHI001	7.17	1070	772	365	445.3	0.55	<0.02	<0.03	0.44	25	623.5	102	220	4620	0.41	3.9	30.8	284	136.4	-
CHI002	8.1	1480	1116	248	302.6	0.961	<0.02	0.247	0.29	8	180.4	17.2	385	146	0.39	4.5	3.9	22	480.6	-
CHI003	6.56	1450	922	258	314.8	1.005	<0.02	0.143	0.17	11	68.3	6	380	52	0.28	3.3	1.4	6	393.2	-
CHI004	7.17	2080	1334	368	449	0.701	<0.02	<0.03	0.56	45	416	212	460	13200	0.17	6.2	45.4	552	207.9	-
CHI005	6.95	898	2944	394	480.7	0.949	<0.02	<0.03	0.49	200	239.4	320	1230	12700	0.23	6.8	148	2130	473.4	-
CHI008	7.15	1688	1173	395	481.9	0.534	<0.02	<0.03	0.85	145	561	129	340	8000	0.34	2.9	54.5	1460	204.4	-
CHI009	7.08	2970	2064	422	514.8	0.751	<0.02	<0.03	0.59	161	495.3	237	890	8010	0.2	7.4	70.6	692	450.9	-
CHI010	7.16	1264	894	419	511.2	0.266	<0.02	<0.03	0.26	200	160.9	129	82.53	3450	0.21	2.3	49.5	532	100.9	-
CHI011	7.05	2730	2086	376	458.7	0.578	<0.02	<0.03	0.32	200	120	278	680	8010	0.19	6.1	99.6	875	238.2	-
CHI012	7.01	2910	2075	370	451.4	0.588	<0.02	<0.03	0.48	200	100	247	780	8470	0.19	5.1	88.2	1090	354.3	-
CHI013	6.91	1410	831	306	373.3	0.637	<0.02	0.032	0.75	84	781	149	260	14900	0.2	5.1	28.7	902	104.2	-
CHI014	7.24	1320	815	342	417.2	0.424	<0.02	<0.03	0.53	34	373.3	140	250	8130	0.24	3.3	27.4	530	127.2	-
CHI015	6.99	2920	2043	404	492.9	1.028	<0.02	<0.03	0.61	189	428	284	840	14200	0.18	3.6	74	1400	288	-
CHI016	7.01	2290	1597	334	407.5	0.728	<0.02	<0.03	0.4	200	320	276	570	6400	0.24	3.2	76	1070	183	-
CHI017	7.1	2360	1421	338	412.4	0.836	<0.02	0.045	0.76	70	668	154	630	9000	0.28	3.6	45	1260	244	-
CHI018	7.19	2510	1816	374	456.3	0.989	<0.02	<0.03	0.44	-	485.6	270	700	7740	0.2	5.6	77.9	999	286.5	-
CHI019	7.35	2770	1922	466	568.5	1.026	<0.02	<0.03	0.61	145	699.2	207	780	6460	0.28	5.6	62.7	1080	502.7	-
CHI020	6.97	947	690	336	409.9	0.573	<0.02	<0.03	0.65	46	724.2	111	180	6610	0.28	3.5	30.1	248	86.8	-
CHI021	7.13	1072	669	348	424.6	0.405	<0.02	<0.03	0.52	30	409.6	109	170	6560	0.23	3.2	25.6	383	89.9	-
CHI022	7.14	671	434	266	324.5	0.169	<0.02	<0.03	0.31	30	295.8	84.3	48.47	4710	0.2	2.7	18.6	880	29.4	-
CHI023	7.15	736	445	290	353.8	0.367	<0.02	<0.03	0.66	17	422.9	90.3	68.02	5160	0.31	2.4	20	532	37	-
CHI024	7.07	1406	1115	337	411.1	0.728	<0.02	<0.03	0.51	177	276.2	166	320	8020	0.26	3.4	47.2	1060	159.6	-
CHI025	7.13	1414	1193	350	427	0.431	0.054	<0.03	0.36	90	935.4	196	390	10500	0.16	5.3	44.3	776	127	-
CHI026	6.76	1884	1693	397	484.3	0.531	<0.02	0.031	0.26	154	522	239	640	11100	0.16	4.7	56.2	836	243.6	-
CHI027	7.04	1990	1773	388	473.4	0.752	<0.02	0.034	0.5	174	332.9	226	690	8590	0.25	6.1	81	688	277.5	-
CHI028	-	2770	3132	446	544.1	1.14	<0.02	0.034	0.78	145	1138	313	1460	12200	0.22	8.6	141	1420	620.9	-
Min.	6.56	671	434	248	302.6	0.169	<0.02	<0.03	0.17	8	68.3	6	48.47	52	0.16	2.3	1.4	6	29.4	-
Max.	8.1	2970	3132	466	568.5	1.14	0.054	0.247	0.85	200	1138	320	1460	14900	0.41	8.6	148	2130	620.9	-
Mean	7.10	1808.08	1421.88	359.12	438.12	0.68	0.01	0.03	0.50	111.20	452.96	180.45	517.08	7959.15	0.24	4.55	55.68	834.88	247.98	-

Table B-5: El Dorado Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
UNI008A	07/20/04	17S15W32BDD1	33.1950	-92.6797	712	El Dorado	C/I
UNI010	07/19/04	18S15W16ACB1	33.1603	-92.6563	295	Greensand	D
UNI011	07/19/04	17S16W24BBC1	33.2340	-92.7163	704	El Dorado	M
UNI015	07/20/04	18S16W01DBC1	33.1839	-92.7071	770	El Dorado	C/I
UNI021	07/19/04	17S15W16BBA1	33.2504	-92.6624	37	Cockfield	C/I
UNI023	07/19/04	16S16W34BDD1	33.2893	-92.7439	56	Cockfield	D
UNI024	07/20/04	17S15W09BBB1	33.2650	-92.6651	550	El Dorado	C/I
UNI025	07/19/04	18S15W35DAC1	33.1097	-92.6181	770	El Dorado	M
UNI026	07/19/04	17S14W14DBC1	33.2381	-92.5175	49	Cockfield	D
UNI027	07/20/04	18S14W07BBA1	33.1776	-92.5918	783	El Dorado	M
UNI028	07/19/04	17S14W32CBB1	33.1981	-92.5746	120	Cockfield	D
UNI029	07/19/04	16S16W34BDD2	33.2888	-92.7454	300	Greensand	D
UNI061	07/19/04	18S15W21DAC1	33.1397	-92.6522	40	Cockfield	D
UNI062R	07/19/04	-	33.1358	-92.6356	-	Cockfield	C/I
UNI063	07/19/04	18S15W20BDC1	33.1436	-92.6790	320	Greensand	D
UNI094	07/20/04	18S16W02AAA1	33.1932	-92.7179	43	Cockfield	D
UNI099	07/20/04	18S16W11CDD1	33.1649	-92.7269	70	Cockfield	D
UNI118A	07/19/04	-	33.2076	-92.6603	746	El Dorado	M
UNI119	07/20/04	17S15W22CCD1	33.2231	-92.6453	330	Greensand	D
UNI120	07/19/04	18S15W27AAB	33.1353	-92.6358	662	El Dorado	C/I
UNI121	07/19/04	18S15W21DAC2	33.1394	-92.6525	310	Greensand	D
UNI122A	07/20/04	-	-	-	566	El Dorado	C/I
UNI900	07/19/04	-	33.2574	-92.6635	528	El Dorado	M
UNI901	07/20/04	-	-	-	-	El Dorado	C

Table B-6: El Dorado Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
UNI008A	8.51	662	386	209	255	0.627	0.012	0.182	-	22.8	10.9	2.13	87.5	<15	0.28	2.13	0.3	5.76	146	11.9
UNI010	8.23	284	171	155	189.1	0.704	0.011	0.109	-	4.25	66.8	10.3	1.94	52.3	0.11	2.63	2.03	23.1	53.5	12.3
UNI011	8.66	423	256	199	242.8	0.461	<0.01	0.263	-	1.4	<8.8	0.87	23	<15	0.26	1.53	<0.013	7.04	99.5	12
UNI015	8.47	563	324	206	251.3	0.591	0.013	0.193	-	27.7	<8.8	1.9	41.4	16.4	0.27	2.31	0.23	5.35	125	11.4
UNI021	6.35	102	102	16.4	20.01	<0.03	0.155	0.013	-	25.4	84.2	5.04	4.43	55.4	0.1	3.94	2.68	33.9	8.61	28.1
UNI023	5.89	115	119	37.4	45.63	<0.03	0.032	0.015	-	4.5	33.4	7.44	11.4	533	0.23	3.39	3.04	91.4	9.36	51
UNI024	8.55	434	261	204	248.9	0.587	<0.01	0.22	-	1.38	16.3	2.68	24	30.8	0.22	2.15	0.49	7.79	99.6	11.6
UNI025	8.42	726	410	216	263.5	0.564	<0.01	0.253	-	5.66	<8.8	1.18	113	<15	0.3	1.96	<0.013	1.66	159	12.5
UNI026	6.57	50	71	14	17.08	<0.03	0.322	0.013	-	4.26	38.4	3.59	2.92	129	0.1	1.45	0.7	4.81	4.17	38.1
UNI027	7.95	729	422	222	270.8	<0.03	0.041	0.199	-	33.6	<8.8	1.17	114	<15	0.28	2.34	0.14	1.4	158	11.9
UNI028	5.5	123	138	29.5	35.99	0.036	0.014	0.034	-	3.89	57.5	4.61	16.7	808	0.19	2.48	1.66	28	15.9	63.7
UNI029	7.43	320	198	178	217.2	0.509	<0.01	0.048	-	2.04	106	16	1.9	104	0.13	3.07	3.17	25.6	55.3	16.1
UNI061	6.5	125	108	53.5	65.27	0.037	0.014	0.015	-	5.97	59.4	21.5	2.19	863	0.1	<0.46	0.45	104	2.42	18.4
UNI062R	6.62	325	172	135	164.7	0.604	<0.01	0.016	-	4.07	316	29.5	14.3	7190	0.13	12.6	11.7	3640	6.64	7.9
UNI063	8.22	292	184	159	194	0.992	<0.01	0.19	-	4.34	55.1	8.16	2.73	51.8	0.12	2.76	1.74	19.7	57	12.9
UNI094	5.94	160	188	33.8	41.24	<0.03	0.113	0.213	-	24	12	7.67	11.5	<15	0.15	1.61	1.18	5.31	22.5	81.8
UNI099	5.92	86	66	17.5	21.35	0.272	3.23	0.011	-	1.56	56.2	4.31	6.44	276	0.06	2.48	1.61	42.6	3.06	12.2
UNI118A	8.49	670	374	201	245.2	0.669	<0.01	0.204	-	1.56	17.2	3.03	115	<15	0.28	2.43	0.48	6.09	142	11.8
UNI119	8.13	299	181	160	195.2	0.8	0.013	0.214	-	4.42	46.9	6.67	2.32	54	0.15	3.38	1.43	16.8	61.4	12
UNI120	8.66	630	365	208	253.8	0.574	<0.01	0.216	-	29.4	<8.8	0.85	64.8	<15	0.26	1.75	<0.013	1.54	140	12.2
UNI121	7.88	308	193	167	203.7	0.754	0.018	0.313	-	2.9	89.8	12.6	4.58	37.3	0.08	3.03	2.65	21.6	54.2	15.9
UNI122A	8.25	505	294	207	252.5	0.467	0.062	0.214	-	6.65	<8.8	1.26	37	27	0.29	2.03	0.14	3.95	113	11.6
UNI900	8.61	550	325	197	240.3	0.554	<0.01	0.227	-	1.56	<8.8	1.11	41.6	<15	0.31	1.77	0.15	4.25	124	11.6
UNI901	8.6	433	259	205	250.1	0.559	0.014	0.222	-	1.5	15.4	2.71	23.8	<15	0.2	2.09	0.48	6.62	98.2	11.5
Min.	5.5	50	66	14	17.08	<0.03	<0.01	0.011	-	1.38	<8.8	0.85	1.9	<15	0.06	<0.46	<0.013	1.4	2.42	7.9
Max.	8.66	729	422	222	270.8	0.992	3.23	0.313	-	33.6	316	29.5	115	7190	0.31	12.6	11.7	3640	159	81.8
Mean	7.60	371.42	231.96	142.92	174.36	0.43	0.17	0.15	-	9.37	46.35	6.51	32.02	428.98	0.19	2.73	1.53	171.18	73.27	20.85

Table B-7: Hardy Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
FUL001	04/12/05	19N06W30BBC1	36.2796	-91.6723	368	Cotter	D
FUL002	04/12/05	19N07W36AAB1	36.2677	-91.6777	1050	Roubidoux	M
FUL003	04/11/05	20N07W26DAA1	36.3624	-91.6918	200	Cotter-Jefferson City	D
FUL004	04/11/05	21N07W35DAA1	36.4347	-91.6919	-	-	D
FUL005	04/11/05	21N06W12ACD1	36.4918	-91.5694	220	Cotter-Jefferson City	D
FUL007	04/11/05	19N06W36CCD1	36.2513	-91.5807	160	Cotter-Jefferson City	D
FUL010	04/11/05	21N06W18CBD1	36.4763	-91.6687	760	Roubidoux	D
FUL011	04/11/05	20N06W33BBD1	36.3515	-91.6342	160	Cotter-Jefferson City	D
SHA001	04/11/05	17N06W23BCC1	36.1100	-91.6035	1045	Cotter-Jefferson City	D
SHA002	04/11/05	18N07W01DCD1	36.2398	-91.6798	-	-	D
SHA003	04/11/05	18N07W01CBB1	36.2443	-91.6912	263	Cotter	D
SHA004	04/11/05	18N06W05DCA1	36.2408	-91.6522	368	Cotter	D
SHA005	04/11/05	18N05W19BBA1	36.2059	-91.5623	563	Cotter-Jefferson City	D
SHA006	04/11/05	19N05W11BDB1	36.3164	-91.4859	1180	Roubidoux-Gunter	M
SHA008	04/11/05	19N05W22CBC1	36.2836	-91.5101	368	Cotter-Jefferson City	C
SHA009	04/12/05	20N04W05ABA1	36.4214	-91.4212	685	Roubidoux	D
SHA010	04/12/05	21N04W33ACC1	36.4309	-91.4064	158	Cotter	D
SHA011	04/12/05	20N04W23BAA1	36.3765	-91.3739	120	Cotter	D
SHA012	04/12/05	19N03W05DCC1	36.3190	-91.3199	830	Roubidoux	D
SHA013	04/12/05	20N03W29ADB1	36.3561	-91.3145	-	-	D
SHA014	04/12/05	19N04W26CCB1	36.2625	-91.3831	188	Cotter	D
SHA016	04/12/05	18N04W28BBB1	36.1876	-91.4229	208	Cotter	D
SHA056	04/11/05	-	36.3211	-91.4839	1590	Roubidoux-Gunter	M
SHA098	04/12/05	-	36.2627	-91.3959	S	Cotter	U
SHA099	04/12/05	-	-	-	S	Cotter	U
SHA150	04/11/05	-	-	-	295	-	D

Table B-8: Hardy Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
FUL001	7.73	444	-	250	305	<0.03	0.726	0.008	0.033	3.55	19.2	48.7	2.39	<100	0.1	0.596	28.4	<1.0	1.58	11
FUL002	7.32	446	-	255	311	<0.03	0.249	0.009	0.03	4.01	23.5	49.5	2.44	<100	0.08	0.915	28.1	<1.0	1.48	10.6
FUL003	7.25	706	-	355	433	<0.03	5.24	0.01	0.044	4	32.2	76	16.4	<100	0.09	0.744	43.6	<1.0	4.73	15.8
FUL004	7.26	797	-	378	461	<0.03	2.63	0.007	0.044	2.58	39	83.8	40.5	<100	0.08	0.702	49.3	<1.0	5.77	13.8
FUL005	7.26	650	-	349	426	<0.03	1.09	0.01	0.043	4.16	32.8	71.2	9.78	<100	0.08	1.05	40.9	<1.0	2.38	13.5
FUL007	7.52	432	-	234	285	<0.03	2.9	0.011	0.034	1.16	25.1	47.4	3.17	<100	0.06	0.509	26.7	<1.0	1.02	11.1
FUL010	6.93	796	-	455	555	<0.03	1.06	0.005	0.034	2.93	32.4	89.5	2.82	<100	0.07	0.728	51.3	5.53	1.02	14.6
FUL011	7.39	569	-	320	390	<0.03	1.49	0.01	0.036	1.85	17.1	28.7	2.18	<100	0.08	0.661	16.5	<1.0	0.932	11.9
SHA001	7.76	512	-	282	344	<0.03	0.455	0.014	0.05	3.74	24	58.1	5.57	<100	0.09	0.826	30.2	<1.0	1.97	13.1
SHA002	7.41	515	-	285	348	<0.03	1.08	0.005	0.026	5.99	15.4	57.4	3.01	<100	0.09	0.831	32.6	<1.0	1.19	10.7
SHA003	7.42	475	-	251	306	<0.03	1.26	0.01	0.03	4.96	29	50.5	8.57	<100	0.09	0.57	29.6	<1.0	2.34	11.7
SHA004	7.39	510	-	292	356	<0.03	0.622	0.008	0.032	2.62	21.4	57.2	2.26	<100	0.07	0.828	32	<1.0	1.16	11.2
SHA005	7.3	578	-	318	388	<0.03	1.87	0.008	0.033	3.56	23.5	65.5	6.42	<100	0.07	0.787	36.4	<1.0	1.73	11.4
SHA006	7.33	654	-	366	447	<0.03	0.041	<0.005	0.031	9.72	35.8	72.6	2.05	<100	0.07	1.14	43.7	<1.0	1.4	11.3
SHA008	7.44	605	-	277	338	<0.03	1.54	0.007	0.032	5.13	36.2	63	34.2	<100	0.05	0.839	35.3	1.46	7.2	11.4
SHA009	7.49	317	-	158	193	<0.03	0.16	0.007	0.021	5.29	21.9	34.5	6.83	<100	0.07	0.623	18.2	<1.0	1.83	12.9
SHA010	7.54	342	-	165	201	<0.03	0.631	0.01	0.02	2.21	20.4	33.6	13.4	<100	0.09	0.842	19.6	<1.0	3.46	10
SHA011	7.47	491	-	285	348	<0.03	0.233	0.007	0.03	3.56	22.9	64.7	2.32	<100	0.08	0.675	36.6	<1.0	0.775	13.8
SHA012	7.2	608	-	334	407	<0.03	0.989	0.005	0.033	10.6	24.4	68	3.82	<100	0.09	1.56	39.3	<1.0	1.73	11.8
SHA013	7.3	685	-	381	465	<0.03	0.586	0.005	0.028	6.04	26.1	79.5	3.02	<100	0.09	0.62	45	<1.0	0.792	9.82
SHA014	7.37	438	-	249	304	<0.03	0.186	0.009	0.031	3.54	18.2	48.1	2.27	<100	0.06	0.384	27.9	<1.0	1.54	13
SHA016	7.26	556	-	308	376	<0.03	0.403	0.007	0.023	6.62	23.6	62.3	2.58	<100	0.08	0.686	36.6	<1.0	1.2	9.45
SHA056	7.24	651	-	366	447	<0.03	0.162	<0.005	0.033	8.57	32	73.1	2.29	<100	0.07	1.19	43.5	<1.0	1.34	11.5
SHA098	7.2	270	-	134	163	<0.03	0.152	0.011	0.022	3.2	17.2	29	1.36	<100	0.06	0.659	16.7	<1.0	0.928	12
SHA099	7.5	131	-	60.9	74	<0.03	0.418	0.016	0.026	3.75	19.3	12.4	1.96	<100	0.04	0.735	7.72	<1.0	1.1	9.81
SHA150	7.47	519	-	267	326	<0.03	0.588	0.01	0.033	2.04	31.6	55.9	18.1	<100	0.06	0.719	31.9	<1.0	2.75	10.6
Min.	6.93	131	-	60.9	74.30	<0.03	0.041	<0.005	0.02	1.16	15.4	12.4	1.36	<100	0.04	0.38	7.72	<1.0	0.78	9.45
Max.	7.76	797	-	455	555.10	<0.03	5.24	0.016	0.05	10.6	39	89.5	40.5	<100	0.10	1.56	51.3	5.53	7.2	15.8
Mean	7.38	527	-	283.65	346.05	<0.03	1.03	0.008	0.03	4.44	25.55	56.93	7.68	<100	0.08	0.79	32.60	0.73	2.05	11.84

Table B-9: Jonesboro Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
CRA002	07/14/03	14N04E07ABA1	35 51 52.2	90 42 01.1	70	Alluvial	D
CRA005	07/14/03	14N04E07CDC2	35 51 08.4	90 42 29.7	180	Memphis	M
CRA009	07/15/03	13N04E03ABB1	35 47 30.1	90 39 06.0	90	Alluvial	I
CRA010	07/15/03	13N04E09DCD1	35 45 52.6	90 39 58.1	105	Alluvial	I
CRA014	07/14/03	14N04E22CBD1	35 49 28.9	90 39 20.9	350	Memphis	M
CRA015	07/14/03	14N04E32BCA1	35 48 10.4	90 41 30.8	342	Memphis	M
CRA017	07/14/03	14N04E28DAB1	35 48 49.4	90 39 49.5	362	Memphis	M
CRA038	07/14/03	14N02E23CDD1	35 49 23.3	90 51 00.4	97	Alluvial	I
CRA039	07/14/03	14N03E14CAA1	35 50 30.3	90 44 22.7	173	Alluvial	I
CRA044	07/15/03	13N05E21BAA1	35 44 57.5	90 33 42.5	871	Wilcox	M
CRA045	07/14/03	15N03E29BBB1	35 54 28.5	90 48 01.3	160	Alluvial	M
CRA046	07/15/03	15N05E29DBB1	35 53 59.9	90 34 33.1	170	-	M
CRA048	07/14/03	14N02E14BDA1	35 50 51.6	90 50 49.5	140	Alluvial	I
CRA049	07/14/03	14N02E08DAB1	35 51 32.8	90 53 39.4	142	Alluvial	I
CRA900	07/14/03	-	-	-	130	Alluvial	I
CRA901	07/15/03	-	-	-	-	-	I
CRA902	07/15/03	-	-	-	-	-	I
PON019	07/15/03	12N03E12BBC1	35 41 24.9	90 43 47.3	160	Alluvial	I

Table B-10: Jonesboro Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
CRA002	6.01	239	152	-	75.8	<0.030	1.64	0.037	-	6.39	46.3	18.8	31.6	25.1	0.09	1.03	7.54	<0.50	16.3	-
CRA005	6.31	256	162	-	101.9	<0.030	2.08	0.019	-	30.6	28.5	21.4	10.6	128	0.12	0.95	9.6	6.63	17.4	-
CRA009	6.91	398	245	-	223.7	<0.030	0.029	0.065	-	18.9	40.9	49.1	11.6	59.8	0.15	1.1	14	257	17.4	-
CRA010	6.99	428	262	-	211.0	<0.030	0.023	0.06	-	41	67.9	37.5	12	256	0.19	1.34	14.8	48.5	35.1	-
CRA014	6.18	143	98	-	61.3	<0.030	0.605	0.014	-	4.59	36.2	10.6	11	203	0.11	1.12	4.45	13.4	11.4	-
CRA015	6.36	163	114	-	70.4	<0.030	0.642	0.027	-	5.01	27.4	12.3	13	104	0.12	1.05	5.32	2.47	12.8	-
CRA017	6.22	177	116	-	82.8	<0.030	0.204	0.037	-	7.76	30.7	14.2	10.4	24.9	0.13	1.01	6.05	5.08	13.4	-
CRA038	7.19	1094	703	-	251.9	0.104	<0.010	0.02	-	147	225	159	185	4580	0.2	2.2	33.7	1130	37.8	-
CRA039	7.03	333	160	-	142.7	<0.030	0.455	0.063	-	6.89	34.7	26.8	14.4	39.6	0.19	0.79	11.3	1.99	14	-
CRA044	8.06	351	215	-	231.8	0.348	<0.010	0.22	-	1.27	14.5	1.16	2.89	95.3	0.19	2.38	0.37	13.4	86.4	-
CRA045	6.17	141	104	-	55.2	<0.030	1.27	0.074	-	5.14	28.2	10.9	12.4	<15.0	0.13	1.29	3.08	3.49	12.7	-
CRA046	6.16	96	71.5	-	36.9	<0.030	0.349	0.017	-	3.84	34.7	6.81	9.38	<15.0	0.16	1.02	2.86	0.68	8.14	-
CRA048	6.85	539	329	-	288.0	0.036	<0.010	0.019	-	39.5	90.8	71.7	17.4	4300	0.18	1.47	17.5	936	22.5	-
CRA049	7.01	736	478	-	343.9	0.341	<0.010	0.018	-	108	466	109	17.4	8790	0.15	2.49	24.5	2180	19.7	-
CRA900	6.35	375	240	-	139.7	<0.030	2.19	0.046	-	46	77.1	31.4	18.2	36.9	0.26	1.42	11.9	<0.50	27.9	-
CRA901	6.89	727	444	-	405.4	0.032	<0.010	0.007	-	59.2	196	99.8	17.5	3500	0.14	1.77	25.9	801	27.9	-
CRA902	7.15	948	581	-	549.0	0.171	<0.010	0.016	-	84.8	393	123	14.4	3540	0.17	2.16	33.9	185	50.3	-
PON019	6.59	788	483	-	393.9	0.049	<0.010	0.021	-	60.8	258	115	43.2	3010	0.16	1.27	30.7	309	14.8	-
Min.	6.01	96	71.5	-	36.92	<0.030	<0.010	0.007	-	1.27	14.5	1.16	2.89	<15.0	0.09	0.79	0.37	<0.50	8.14	-
Max.	8.06	1094	703	-	549.04	0.348	2.19	0.22	-	147	466	159	185	8790	0.26	2.49	33.9	2180	86.4	-
Mean	6.69	440.7	275.4	-	203.63	0.069	0.529	0.043	-	37.59	116.4	51.03	25.13	1594.9	0.16	1.44	14.3	327.5	24.77	-

Table B-11: Lonoke Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
LON003A	08/02/04	03N08W30DDD1	34.8497	-91.8945	160	Alluvial	C
LON009A	08/02/04	-	34.8319	-91.9447	~150	Alluvial	I
LON010	08/02/04	02N08W06ADA1	34.8295	-91.8946	128	Alluvial	D
LON014	08/02/04	02N08W20BCD1	34.7861	-91.8916	164	Alluvial	M
LON016	08/02/04	02N09W28CCC1	34.7636	-91.9860	136	Alluvial	I
LON017	08/02/04	02N08W32BCC1	34.7590	-91.8788	195	Alluvial	I
LON017A	08/02/04	02N08W32	34.7551	-91.8962	~250	Alluvial	I
LON021A	08/02/04	-	34.7054	-91.9846		-	-
LON022	08/02/04	02N09W34AAA1	34.7623	-91.9521	354	Sparta	C/I
LON024	08/02/04	01N08W16BAC1	34.7157	-91.8757	~150	Alluvial	I
LON040	08/02/04	-	34.6871	-91.9769	-	Alluvial?	C
LON900	08/02/04	-	34.8495	-91.8821	-	-	-
LON901	08/02/04	-	-	-	462	Sparta	M
LON902	08/02/04	-	34.6908	-91.9851	-	Alluvial	-
LON903	08/02/04	-	34.6973	-91.9354	-	Alluvial	-

Table B-12: Lonoke Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
LON003A	6.36	186	138	62.5	76.25	0.244	0.023	0.0156	-	7.39	121	14.7	9.9	4990	0.22	<.046	4.62	1720	11.5	13.3
LON009A	6.74	253	193	91.8	112	0.044	0.015	0.0125	-	13.7	209	25.7	24.4	2310	0.18	<.046	8.07	536	16.8	33
LON010	6.55	309	216	111	135.4	0.094	0.012	0.0109	-	11.5	197	29.4	23.6	526	0.24	1.18	8.77	1220	17.4	34.6
LON014	6.61	367	230	149	181.8	0.145	0.012	0.0133	-	8.8	210	38.7	18.7	3990	0.29	<.046	11.3	533	18.9	34
LON016	6.86	838	523	270	329.4	0.53	0.016	0.0124	-	105	492	144	16.8	14500	0.19	<.046	22.9	394	14	22.8
LON017	6.93	555	341	237	289.1	0.117	<.001	0.0135	-	40.6	348	76	10.7	2900	0.21	<.046	18.3	244	15.2	26.3
LON017A	6.65	644	417	233	284.3	0.215	<.001	0.013	-	53.3	376	99.1	23	3950	0.2	<.046	19.2	744	16.2	29.3
LON021A	6.93	765	462	279	340.4	0.441	0.013	0.0131	-	41	437	111	33.7	9160	0.2	<.046	18.7	589	26.4	22.7
LON022	6.67	388	222	188	229.4	0.176	0.015	0.0124	-	2.53	334	44.8	7.37	3980	0.19	5.4	10.9	243	21.1	14.4
LON024	6.81	674	424	255	311.1	0.559	0.017	0.0117	-	29.7	512	102	23.4	2420	0.21	<.046	17.9	375	26.6	25.5
LON040	6.7	847	487	248	302.6	0.94	<.001	0.012	-	59.8	555	96	59.7	22900	0.25	4.42	21.8	659	42.7	21.6
LON900	6.4	234	179	56.2	68.56	0.112	0.012	0.021	-	23.1	120	17.3	14	6010	0.15	<.046	5.68	2460	14.7	41.8
LON901	6.81	512	292	218	266	0.285	0.016	0.0117	-	9.19	360	46.6	20.6	5440	0.16	1.08	11.9	421	42.8	13.3
LON902	6.88	605	344	232	283	0.903	0.016	0.0116	-	10.7	542	75.8	37.8	11000	0.27	<.046	15.8	528	21.3	18
LON903	6.81	658	425	216	263.5	0.435	0.015	0.0133	-	80	235	102	10.5	15800	0.22	<.046	16.6	522	12.8	27.4
Min.	6.36	186	138	56.2	68.56	0.044	<.001	0.0109	-	2.53	120	14.7	7.37	526	0.15	<.046	4.62	243	11.5	13.3
Max.	6.93	847.00	523.00	279.00	340.38	0.94	0.02	0.02	-	105.00	555.00	144.00	59.70	22900	0.29	5.40	22.90	2460.00	42.80	41.80
Mean	6.71	522.33	326.20	189.77	231.52	0.35	0.01	0.01	-	33.09	336.53	68.21	22.28	7325.07	0.21	0.97	14.16	745.87	21.23	25.20

Table B-13: Omaha Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
BNE002	03/19/07	19N21W14CDA1	36.2981	-93.1850	spring	Springfield Plateau	U
BNE003	03/19/07	19N22W12CAB1	36.3168	-93.2735	spring	Springfield Plateau	D
BNE005A	3/19/07	19N21W05DDB1	36.3267	-93.2278	spring	Springfield Plateau	D
BNE007	03/20/07	19N21W31ACB1	36.3839	-93.2081	spring	Springfield Plateau	D
BNE008A	03/20/07	20N20W02DBB2	36.4170	-93.1770	spring	Springfield Plateau	D
BNE012	03/19/07	21N20W29ACD1	36.4464	-93.1253	spring	Springfield Plateau	D
BNE017	03/20/07	21N21W09BAD1	36.4958	-93.2128	spring	Springfield Plateau	D
BNE023	03/19/07	20N21W33ACA1	36.3753	-93.2415	565	Ozark	D
BNE024	03/19/07	20N22W13CBD1	36.3891	-93.2734	460	Ozark	D
BNE025	03/20/07	20N21W15CAD1	36.3883	-93.1978	455	Ozark	D
BNE028	03/19/07	20N22W03DDA1	36.4169	-93.2975	400	Ozark	D
BNE029	03/19/07	21N21W26ADA1	36.4483	-93.1694	675	Ozark	D
BNE030A	03/20/07	21N20W23CDD1	36.4514	-93.0767	225	Ozark	D
BNE032	03/19/07	21N21W15BDA1	36.4787	-93.1970	705	Ozark	D
BNE033	03/19/07	21N22W12DCC1	36.4861	-93.2667	550	Ozark	D
BNE036	03/20/07	21N21W22DDA1	36.4567	-93.1887	1340	Ozark	M
BNE037	03/19/07	19N21W20BDC1	36.2895	-93.2374	450	Ozark	D
BNE040	03/19/07	20N21W31ABC1	36.3514	-93.2494	~160	Springfield Plateau	D
BNE042	03/20/07	20N20W09AAA1	36.4061	-93.1050	spring	Ozark	U
BNE044	03/20/07	21N21W09ABB1	36.4975	-93.2118	spring	Springfield Plateau	D
BNE046	03/20/07	20N19W23CDC3	36.4519	-93.0788	248	Ozark	D
BNE047	03/20/07	20N20W02DBA3	36.4167	-93.1759	375	Ozark	D
BNE048	03/20/07	20N19W10BCA2	36.4026	-93.0988	~465	Ozark	D
BNE050	03/20/07	19N20W20BCC2	36.3741	-93.1352	550	Ozark	D
BNE055	03/19/07		36.3492	-93.2519	spring	Springfield Plateau	D

Table B-14a: Omaha Monitoring Area Selected Descriptive Statistics: Springfield Plateau Aquifer

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
BNE002	-	-	268	215.0	262.30	<0.030	2.08	0.019	-	7.29	37.7	84.0	10.6	<20	0.11	1.33	1.58	<0.30	3.15	10.10
BNE003	-	-	318	201.1	245.22	<0.030	3.06	0.019	-	13.40	51.6	97.5	14.2	<20	0.06	1.87	1.78	<0.30	4.05	10.20
BNE005A	-	-	273	215.0	262.30	<0.030	1.96	0.021	-	7.48	39.2	84.9	11.7	<20	0.04	1.53	1.34	<0.30	2.90	9.98
BNE007	-	-	296	210.0	256.20	<0.030	4.21	0.024	-	13.90	46.1	88.8	13.4	<20	0.11	1.48	1.91	<0.30	3.95	10.40
BNE008A	-	-	204	123.0	150.06	<0.030	3.71	0.040	-	12.30	55.0	52.1	15.2	<20	0.09	2.93	3.36	87.7	3.93	9.80
BNE012	-	-	209	101.0	123.22	<0.030	9.25	0.018	-	10.10	35.8	49.6	5.8	<20	0.04	2.50	2.59	<0.30	2.20	11.20
BNE017	-	-	168	99.4	121.27	<0.030	2.67	0.030	-	4.30	48.8	40.4	17.5	<20	0.05	1.56	2.54	<0.30	5.24	9.95
BNE040	-	-	318	218.0	265.96	<0.030	3.70	0.017	-	6.30	38.7	95.4	20.1	21.1	0.04	1.22	1.70	0.59	3.04	11.20
BNE044	-	-	132	60.4	73.69	<0.030	1.89	0.018	-	6.69	49.8	25.4	22.4	<20	0.14	1.69	2.85	<0.30	6.97	9.39
BNE055	-	-	260	201.0	245.22	<0.030	2.58	0.026	-	5.60	37.4	81.4	10.1	<20	0.05	1.61	1.30	<0.30	2.47	9.88
Min.	-	-	132	60.4	73.69	<0.030	1.89	0.017	-	4.30	35.8	25.4	5.8	<20	0.04	1.22	1.30	<0.30	2.20	9.39
Max.	-	-	318	218.0	265.96	<0.030	9.25	0.040	-	13.90	55.0	97.5	22.4	21.1	0.14	2.93	3.36	87.7	6.97	11.20
Mean	-	-	244.6	164.4	200.54	<0.030	3.51	0.023	-	8.74	44.01	69.95	14.1	11.1	0.07	1.77	2.10	8.95	3.79	10.21

Table B-14b continued: Omaha Monitoring Area Selected Descriptive Statistics: Ozark Aquifer

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
BNE023	-	-	274	222	270.84	<0.03	0.051	0.007	-	28.4	15.1	65.9	5.63	<20.0	0.45	1.08	14.0	0.52	6.03	10.00
BNE024	-	-	256	222	270.84	<0.03	0.216	0.007	-	21.1	10.4	47.0	3.37	<20.0	0.82	5.03	23.5	0.86	5.74	8.14
BNE025	-	-	344	210	256.20	<0.03	3.840	0.009	-	51.6	20.1	70.6	28.10	<20.0	0.16	1.90	24.2	0.45	0.45	9.60
BNE028	-	-	286	217	264.74	<0.03	1.080	0.012	-	29.3	16.4	63.4	13.20	<20.0	0.79	3.75	17.7	7.26	5.25	8.80
BNE029	-	-	358	270	329.40	<0.03	0.960	0.007	-	57.9	27.3	73.9	4.63	<20.0	0.26	3.16	29.1	1.33	1.53	8.61
BNE030A	-	-	370	306	373.32	<0.03	1.650	0.007	-	43.4	16.4	67.9	5.63	52.8	0.12	2.26	38.6	3.38	1.46	8.52
BNE032	-	-	195	139	169.58	<0.03	0.069	0.007	-	42.3	14.1	37.1	1.38	<20.0	0.38	2.38	18.4	2.16	0.92	8.03
BNE033	-	-	191	168	204.96	<0.03	0.151	0.008	-	14.7	10.4	36.8	2.08	<20.0	0.11	1.07	18.8	0.34	1.11	9.72
BNE036	-	-	196	181	220.82	<0.03	0.084	0.008	-	16.6	3.0	39.9	1.83	<20.0	0.16	1.50	17.8	1.79	1.06	9.19
BNE037	-	-	318	256	312.32	<0.03	0.839	0.008	-	29.2	22.6	79.3	7.09	<20.0	0.42	0.95	14.6	1.26	5.39	9.02
BNE042	-	-	381	355	433.10	<0.03	2.620	0.010	-	6.5	35.2	73.5	9.08	<20.0	0.14	1.15	42.4	<0.30	1.61	12.70
BNE046	-	-	327	298	363.56	<0.03	0.094	0.008	-	21.3	6.7	62.5	2.41	<20.0	0.45	3.76	32.6	1.03	1.20	8.65
BNE047	-	-	499	303	369.66	<0.03	0.113	0.007	-	156.0	21.2	92.1	2.72	<20.0	0.43	5.98	43.3	0.79	2.07	8.68
BNE048	-	-	357	349	425.78	<0.03	0.192	0.008	-	11.6	24.3	69.3	3.58	<20.0	0.12	1.14	40.9	<0.30	1.09	8.43
BNE050	-	-	323	276	336.72	<0.03	0.098	0.008	-	33.9	17.0	68.8	1.92	<20.0	0.06	1.40	28.8	<0.30	1.19	10.70
Min.	-	-	191	139	169.58	<0.03	0.051	0.007	-	6.5	3.0	36.8	1.38	<20.0	0.06	0.95	14.0	<0.30	0.45	8.03
Max.	-	-	499	355	433.10	<0.03	3.840	0.012	-	156.0	35.2	92.1	28.10	52.8	0.82	5.98	43.3	7.26	6.03	12.70
Mean	-	-	312	251	307	<0.03	0.804	0.008	-	37.6	17.3	63.2	6.18	12.85	0.32	2.43	26.98	1.44	2.41	9.25

Table B-15: Ouachita Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
OUA005	03/09/04	12S19W13BCB1	33 41 42.4	93 01 06.4	60	Cane River/Sparta	M
OUA008	03/09/04	13S17W28DDC1	33.5641	92.8554	40	Alluvial	S
OUA017	03/08/04	13S19W28BCD1	33 34 32.8	93 04 16.9	52	Sparta	D
OUA024	03/08/04	14S18W27BDC1	33 29 16.3	92 57 06.6	55	Sparta	M
OUA028	03/08/04	14S19W20BAD1	33 30 26.0	93 05 13.4	61	Sparta	M
OUA030	03/08/04	15S19W10DCC1	33 26 18.0	93 03 18.4	370	Cane River	M
OUA031	03/08/04	15S19W22CCC1	33 24 37.0	93 03 50.3	375	Cane River	M
OUA033	03/08/04	15S19W30DBD1	33 23 56.7	93 06 18.3	59	Sparta	D
OUA034	03/08/04	15S19W33BDB1	33.3904	93.0787	295	Sparta	D
OUA036	03/09/04	14S17W30ACD1	33 29 10.2	92 29 10.2	52	Sparta	D
OUA037	03/08/04	14S17W08CDA1	33.5244	92.8786	-	-	D
OUA041	03/08/04	14S18W28CAB1	33 29 16.3	92 58 06.2	spring	Sparta	U
OUA048	03/09/04	-	33.5350	92.9247	60	Sparta	D
OUA900	03/08/04	-	33.4709	92.8816	42	Sparta	D
OUA901	03/09/04	-	33.5430	92.9664	130	Sparta	S

Table B-16: Ouachita Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
OUA005	4.95	33	19.5	2.2	2.68	<0.030	0.146	0.006	-	4.68	24.6	0.75	2.62	25.5	0.07	0.75	0.63	8.05	2.58	8.5
OUA008	4.91	55	50.5	7.5	9.15	<0.030	0.699	0.012	-	2.84	28.3	1.99	7.05	<15.0	0.06	<0.46	0.3	11.4	6.53	26.7
OUA017	5.45	36	26.5	5.2	6.34	<0.030	0.155	0.006	-	6.31	32.7	1.26	2.89	<15.0	0.11	1.13	0.74	6.66	2.46	12.5
OUA024	6.61	131	77	152	185.44	<0.030	0.208	0.735	-	28.8	<8.80	13.5	12.7	24.8	0.11	1.24	1.58	0.77	5.06	5.1
OUA028	6.01	58	54	13.7	16.71	<0.030	0.04	0.01	-	6.72	35.8	6.16	1.9	2090	0.09	1.05	<0.13	16.2	1.77	35.8
OUA030	6.51	192	127	66.1	80.64	0.189	0.032	0.011	-	15.5	112	14.3	5.4	3250	0.15	3.59	2.99	63.8	17.2	29.5
OUA031	7.17	249	138	105	128.10	0.337	0.041	0.015	-	10.1	127	12.3	7.81	1700	0.11	3.39	2.86	22.2	35.4	14.7
OUA033	7.15	337	207	86.3	105.29	<0.030	0.029	0.031	-	47.6	36.7	46.8	21.1	21.4	0.15	5.14	2.63	3.46	14.1	26.1
OUA034	7.80	254	140	122	148.84	0.393	0.027	0.034	-	7.62	118	13.6	3.58	1110	0.11	2.89	3.06	29.8	34.9	13.3
OUA036	5.16	98	69	7.7	9.39	<0.030	3.62	0.008	-	7.32	143	3.44	9.68	24	0.12	1.25	1.9	14	9.41	14.1
OUA037	5.44	60	40	14.1	17.20	<0.030	0.776	0.008	-	4.87	42.8	4.81	3.26	<15.0	0.07	1.06	0.72	3	4.31	12.4
OUA041	4.82	25	29	3.3	4.03	<0.030	0.303	0.01	-	2.29	9.1	0.36	2.28	30.7	0.06	0.65	0.28	5.92	1.7	15.6
OUA048	6.36	170	105	32.4	39.53	<0.030	3.45	0.009	-	18.6	74.8	19.4	8.58	56.3	0.12	2.47	2.65	13	4.01	18.4
OUA900	5.54	131	99	5.1	6.22	<0.030	4.87	0.007	-	3.3	241	8.66	16.7	526	0.13	3.6	4.39	9.97	3.3	17.5
OUA901	6.48	207	110	73	89.06	0.198	0.015	0.012	-	3.75	131	13.2	13.8	2770	0.1	3.67	2.83	37.2	20.8	12.5
Min.	4.82	25.00	19.50	2.20	2.68	<0.030	0.02	0.01	-	2.29	<8.80	0.36	1.90	<15.0	0.06	0.65	<0.13	0.77	1.70	5.10
Max.	7.80	337.00	207.00	152.00	185.44	0.393	4.87	0.74	-	47.60	241.00	46.80	21.10	3250.00	0.15	5.14	4.39	63.80	35.40	35.80
Mean	6.02	135.73	86.10	46.37	56.58	0.085	0.96	0.06	-	11.35	77.41	10.70	7.96	776.75	0.10	2.14	1.84	16.36	10.90	17.51

Table B-17: Pine Bluff Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
JEF003	08/23/04	05S09W19BAA1	34.2689	-92.0247	1275	Sparta	C/I
JEF004	08/23/04	05S09W30DBA1	34.2517	-92.0247	792	Sparta	C
JEF005	08/23/04	-	34.2285	-92.0206	-	Sparta	M
JEF008	08/24/04	05S10W11ACA1	34.2944	-92.0567	992	Sparta	C
JEF010	08/23/04	06S09W04BAB1	34.2251	-92.0183	865	Sparta	M
JEF012	08/23/04	06S09W17CCC1	34.1969	-92.0414	848	Sparta	M
JEF016	08/23/04	05S09W07CCC1	34.2847	-92.0328	265	Cockfield	D
JEF024	08/23/04	05S08W30AAB1	34.2521	-91.9128	~900	Sparta	C/I
JEF028	08/23/04	-	34.2983	-91.9730	-	Alluvial	I
JEF034	08/23/04	05S09W34CAB1	34.2317	-91.9736	102	Alluvial	C/I
JEF038A	08/23/04		34.2201	-91.9187	108	Alluvial	C/I
JEF039	08/23/04	06S08W10CAA1	34.2164	-91.8956	1020	Sparta	C/I
JEF041	08/23/04	-	34.2577	-92.0716	-	Sparta	M
JEF042	08/23/04	-	34.1763	-92.0464	-	Cockfield	D
JEF044	08/23/04	-	34.2556	-92.0263	~76	Alluvial	C
JEF045	08/23/04	-	34.2575	-92.0240	772	Sparta	C
JEF900	08/23/04	-	34.3651	-92.0356	~400	-	C

Table B-18: Pine Bluff Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
JEF003	6.68	126	86	51.4	62.71	0.164	0.012	0.01	-	5.36	137	5.35	2.8	2530	0.2	4.94	1.45	52.9	14.4	15.4
JEF004	6.33	139	85	55.7	67.95	0.177	0.014	0.009	-	2.65	131	4.24	2.76	7750	0.15	5.35	1.34	101	16.4	17.2
JEF005	6.6	125	80	53.3	65.03	0.159	0.015	0.009	-	4.04	127	6.78	2.35	2540	0.22	6.48	1.71	70.2	11.4	16.2
JEF008	6.46	126	88	51.4	62.71	0.159	0.013	0.011	-	4.45	123	6.54	2.4	2740	0.16	5	1.65	62.6	12.5	13.8
JEF010	6.64	161	88	61.7	75.27	0.172	0.012	0.01	-	1.41	137	7.19	2.04	10000	0.21	7.1	1.84	143	13.5	17.1
JEF012	7.2	155	99	70.8	86.38	0.228	0.012	0.014	-	4.24	99.9	8.46	1.8	2050	0.17	6.88	1.75	80	17.2	18.5
JEF016	6.61	470	322	192	234.24	0.387	0.02	0.018	-	16.7	65.7	20.5	19.9	5250	0.18	4.63	5.79	356	74.2	42.8
JEF024	7.14	167	117	68.1	83.08	0.209	0.012	0.011	-	9.63	117	7	2.01	2270	0.22	6.18	1.62	57.6	20.7	16.5
JEF028	6.87	856	481	360	439.20	1.02	0.014	0.011	-	30.5	324	102	35.8	9720	0.33	2.17	26.6	322	47.9	28.5
JEF034	6.74	632	362	279	340.38	0.567	0.016	0.01	-	16.1	410	81.7	18	12800	0.25	1.55	21.6	288	16.8	32
JEF038A	6.63	1230	691	410	500.20	0.664	0.012	0.011	-	6.53	494	137	139	15200	0.23	2.36	24.1	930	91.4	29.1
JEF039	7.32	167	102	74.9	91.38	0.213	0.013	0.019	-	6.37	92	7.19	1.69	1670	0.23	5.92	1.53	51.4	21.5	16.1
JEF041	6.36	101	73	42.3	51.61	0.101	0.011	0.009	-	3.77	135	5.31	2.55	2460	0.14	5.01	1.54	53.1	8.62	15.4
JEF042	7.94	504	337	169	206.18	0.321	0.018	0.324	-	68.9	<8.8	3.25	8.25	369	0.14	4.34	0.76	31.8	109	35
JEF044	6.2	575	277	169	206.18	0.431	0.023	0.028	-	14	299	33.1	32	44500	0.13	2.25	13.8	2850	40.9	33.6
JEF045	6.86	112	79	48.8	59.54	<.03	0.232	0.012	-	4.4	118	4.61	2.72	111	0.19	5.91	1.41	<0.5	14.2	15.9
JEF900	7.8	662	400	218	265.96	1.18	0.026	0.054	-	65.9	60	16.2	36.3	22	0.54	4.51	2.48	27	124	10.6
Min.	6.2	101	73	42.3	51.61	<.03	0.011	0.009	-	1.41	<8.8	3.25	1.69	22	0.13	1.55	0.76	<0.5	8.62	10.6
Max.	7.94	1230	691	410	500.20	1.18	0.232	0.324	-	68.9	494	137	139	44500	0.54	7.1	26.6	2850	124	42.8
Mean	6.85	371.06	221.59	139.7	170.47	0.36	0.28	0.034	-	15.59	169.06	26.85	18.37	7175	0.22	4.74	6.53	322.17	38.51	21.98

Table B-19: Athens Piedmont Plateau/Gulf Coastal Plain Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Aquifer	Use
ATH001	04/05/04	-	34.32529	93.50876	90	Stanley Shale	D
ATH002	04/05/04	-	34.31377	93.70008	105	Stanley Shale	D
ATH003	04/05/04	-	34.29457	93.94424	85	Stanley Shale	D
ATH004	04/05/04	-	34.31185	94.01291	100?	Stanley Shale	D
ATH005	04/05/04	-	34.31185	94.01291	180?	Stanley Shale	D
ATH006	04/05/04	-	34.26494	94.06884	120	Stanley Shale	D
ATH007	04/05/04	-	34.26494	94.06884	65	Stanley Shale	D
ATH008	04/05/04	-	34.29188	94.18110	207	Stanley Shale	D
ATH009	04/05/04	-	34.34656	94.26499	na	Arkansas Novaculite	not used
ATH010	04/05/04	-	34.21957	93.92500	190?	Stanley Shale	D
ATH011	04/05/04	-	34.19201	93.90828	140	Stanley Shale	D
ATH012	04/05/04	-	34.06807	93.70250	150	Alluvial Aquifer	D
ATH013	04/05/04	-	34.06545	93.71374	60	Alluvial Aquifer	D
ATH014	04/05/04	-	34.06995	93.70943	?	Alluvial Aquifer	D
ATH015	04/06/04	-	33.88086	93.91615	480	Terrace deposits	M
ATH016	04/06/04	-	33.87494	93.92178	525	Terrace deposits	M
ATH017	04/06/04	-	33.80346	93.96156	505	Tokio Formation	M
ATH018	04/06/04	-	33.87584	93.91357	?	Terrace deposits	M
ATH019	04/06/04	-	33.92923	93.88537	85	Tokio Formation	D
ATH020	04/06/04	-	33.95035	93.95948	188	Tokio Formation	D
ATH021	04/06/04	-	33.95772	93.95915	230	Tokio Formation	D
ATH022	04/06/04	-	34.00844	93.56659	125	Alluvial Aquifer	D
ATH023	04/06/04	-	34.04051	93.67160	?	Alluvial Aquifer	D
ATH024	04/06/04	-	34.15699	93.73057	420	Jackfork Sandstone	D
ATH025	04/06/04	-	34.23979	93.64162	185?	Stanley Shale	D
ATH026	04/06/04	-	34.35751	93.50001	110	Stanley Shale	D

Table B-20: Athens Piedmont Plateau/Gulf Coastal Plain Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
ATH001	7.07	259	188.0	126.0	153.7	<0.030	0.030	0.027	-	8.26	45.70	31.20	3.18	209.0	0.31	0.94	5.89	666	15.10	35.80
ATH002	7.06	266	197.0	120.0	146.4	<0.030	0.094	0.077	-	10.70	64.80	29.30	7.05	<15.0	0.25	1.02	5.55	20	15.80	40.20
ATH003	6.85	119	127.0	54.4	66.4	<0.030	0.023	0.016	-	2.83	13.10	7.14	3.73	1410.0	0.32	0.64	2.87	442	13.50	46.80
ATH004	5.22	188	172.0	12.6	15.4	<0.030	14.000	0.028	-	2.90	83.90	9.51	10.20	<15.0	0.16	2.53	4.42	128	14.50	36.90
ATH005	6.00	140	141.0	54.9	67.0	<0.030	0.732	0.068	-	8.84	14.50	10.50	4.90	15.7	0.43	1.06	3.69	214	11.80	45.60
ATH006	7.10	278	193.0	143.0	174.5	0.085	0.042	0.062	-	4.50	48.80	36.90	3.13	52.6	0.23	<0.46	4.51	330	14.40	34.90
ATH007	6.45	163	131.0	78.0	95.2	<0.030	0.136	0.015	-	4.86	20.40	16.70	3.70	30.8	0.17	0.84	4.40	109	9.79	26.10
ATH008	6.88	432	301.0	174.0	212.3	<0.030	0.020	0.072	-	55.90	78.80	61.70	1.99	127.0	0.31	0.47	10.10	1590	17.30	33.40
ATH009	7.07	200	137.0	98.5	120.2	<0.030	0.044	0.043	-	3.83	<8.80	34.40	2.70	<15.0	0.11	<0.46	1.59	<0.50	2.83	13.20
ATH010	7.19	158	114.0	51.5	62.8	<0.030	0.243	0.009	-	42.30	11.20	21.30	5.34	<15.0	0.08	0.78	1.55	<0.50	2.09	4.30
ATH011	8.04	365	228.0	189.0	230.6	0.156	0.063	0.027	-	6.97	722.00	15.30	3.93	<15.0	0.30	0.72	3.61	24.1	63.30	15.30
ATH012	7.78	816	440.0	206.0	251.3	0.512	0.020	0.006	-	21.90	90.70	26.80	115.00	121.0	0.33	3.44	8.24	6.55	124.00	8.60
ATH013	7.84	899	524.0	212.0	258.6	0.454	0.067	0.011	-	49.60	54.90	25.40	124.00	16.5	0.87	3.36	8.12	6.31	146.00	8.50
ATH014	7.04	1700	821.0	166.0	202.5	0.151	0.099	0.010	-	15.00	418.00	67.00	385.00	110.0	0.28	3.42	10.80	641	213.00	10.50
ATH015	9.20	720	438.0	367.0	447.7	0.337	0.021	0.101	-	18.80	<8.80	1.03	3.07	<15.0	2.07	0.91	<0.13	5.2	168.00	10.20
ATH016	9.09	577	365.0	244.0	297.7	0.259	0.018	0.070	-	49.30	<8.80	1.31	5.61	<15.0	0.85	0.71	<0.13	9.8	128.00	10.80
ATH017	9.11	682	406.0	343.0	418.5	0.359	0.020	0.097	-	20.00	<8.80	0.88	2.77	28.1	1.66	0.86	<0.13	10.9	158.00	10.10
ATH018	8.80	533	332.0	245.0	298.9	0.232	0.018	0.252	-	28.90	<8.80	0.48	8.61	<15.0	0.61	1.05	<0.13	2.14	129.00	10.50
ATH019	5.73	64	83.0	17.7	21.6	<0.030	0.011	0.010	-	7.96	32.80	2.26	2.04	4040.0	0.19	3.35	1.18	253	3.46	29.30
ATH020	6.38	188	127.0	89.0	108.6	<0.030	0.035	0.128	-	5.12	22.60	23.00	3.43	<15.0	0.26	2.54	4.12	4.54	6.91	16.40
ATH021	6.23	136	111.0	62.1	75.8	<0.030	0.049	0.090	-	4.60	13.00	15.60	3.65	70.4	0.30	2.45	3.25	19.2	5.64	16.90
ATH022	4.58	22	46.5	5.3	6.5	<0.030	0.231	0.010	-	1.95	9.66	0.14	2.49	<15.0	0.13	<0.46	0.27	6.78	1.67	11.40
ATH023	8.04	561	343.0	200.0	244.0	0.532	0.017	0.022	-	42.20	38.10	7.08	30.90	48.8	0.40	2.56	2.02	14.5	114.00	8.50
ATH024	7.14	421	250.0	176.0	214.7	0.125	0.019	0.011	-	4.61	89.90	2.86	25.30	2030.0	0.32	0.88	2.06	76.3	88.60	13.40
ATH025	7.46	145	99.0	54.1	66.0	<0.030	0.133	0.010	-	29.20	12.70	20.20	4.72	<15.0	0.10	0.84	1.87	<0.50	2.63	4.10
ATH026	7.11	405	255.0	171.0	208.6	<0.030	0.335	0.034	-	20.40	89.70	43.20	15.40	16.8	0.26	1.16	10.50	74.7	23.50	27.00
Min.	4.58	22	46.5	5.3	6.5	<0.030	0.011	0.006	-	1.95	<8.80	0.14	1.99	<15.0	0.08	<0.46	<0.13	<0.50	1.67	4.10
Max.	9.20	1700	821.0	367.0	447.7	0.532	14.000	0.252	-	55.90	722.00	67.00	385.00	4040.0	2.07	3.44	10.80	1590	213.00	46.80
Mean	7.17	401	252.7	140.8	171.7	0.132	0.635	0.050	-	18.13	76.82	19.66	30.07	323.4	0.43	1.43	3.88	179.03	57.42	20.33

Table B-21: Northeastern Ouachitas Monitoring Area Sampling Locations

Station ID	Collect Date	T/R Location	Latitude	Longitude	Well Depth (ft.)	Surface Geology	Use
FRO001	09/13/04	-	34.6825	-92.4234	175	Womble Shale	D
FRO002	09/13/04	-	34.7437	-92.5005	~120	Stanley Shale	D
FRO003	09/13/04	-	34.7372	-92.5499	unk	Womble Shale	D
FRO005	09/13/04	-	34.7450	-92.5418	unk	Womble Shale	D
FRO006	09/13/04	-	34.7017	-92.5744	87	Bigfork Chert	D
FRO007	09/13/04	-	34.7984	-92.5690	~70	Womble Shale	D
FRO008	09/13/04	-	34.7227	-92.5384	67	Womble Shale	D
FRO009	09/13/04	-	34.6863	-92.5177	65	Bigfork Chert	D
FRO010	09/13/04	-	34.6618	-92.5462	~160	Womble Shale	D
FRO011	09/20/04	-	34.8033	-92.5611	105	Bigfork Chert - Arkansas Novaculite	D
FRO012	10/11/04	-	34.7467	-92.5444	~75	Womble Shale	D
FRO013	10/11/04	-	34.7452	-92.5442	<75	Womble Shale	D
FRO014	10/11/04	-	34.6830	-92.4235	~160	Womble Shale	D
FRO015	10/11/04	-	34.6819	-92.4234	~500	Womble Shale	D
FRO016	10/19/04	-	34.6822	-92.4224	unk	Womble Shale	D
FRO017	10/19/04	-	34.6811	-92.4222	200	Womble Shale	D
FRO018	10/19/04	-	34.6800	-92.4231	<180	Womble Shale	D
FRO019	10/19/04	-	34.6803	-92.4231	~180	Womble Shale	D
FRO020	10/19/04	-	34.6858	-92.4232	~35	Womble Shale	D
FRO021	10/26/04	-	34.6854	-92.4235	unk	Womble Shale	D
FRO022	10/26/04	-	34.6853	-92.4450	140	Womble Shale	D
FRO023	11/15/04	-	34.7808	-92.7089	unk	Stanley Shale	D
FRO024	11/15/04	-	34.7938	-92.6916	spring	Bigfork Chert/Polk Creek Sh. Contact	U
FRO025	11/15/04	-	34.7876	-92.6202	~120	Womble Shale	D
FRO026	11/15/04	-	34.7717	-92.5664	spring	Arkansas Novaculite	U
FRO027	11/15/04	-	34.7924	-92.6991	60	Arkansas Novaculite	D
FRO028	11/16/04	-	34.9103	-92.4922	90	Terrace	M
FRO029	11/16/04	-	34.9035	-92.4974	90	Terrace	M
FRO030	11/16/04	-	34.9027	-92.5036	90	Terrace	M

Table B-22: Northeastern Ouachitas Monitoring Area Selected Descriptive Statistics

Sample ID	pH	Conductivity	TDS	Alkalinity	HCO3	NH3-N	NO3-N	O-Phos.	T-Phos.	SO4	Ba	Ca	Cl	Fe	F	K	Mg	Mn	Na	SiO2
		uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
FRO001	7.59	479	321	199	242.8	<0.03	6.34	0.013	-	14.9	22.4	82.8	13.8	16.7	0.46	1.33	10.9	2.05	6.06	13.4
FRO002	6.18	54	69	14.5	17.7	<0.03	1.02	0.036	-	2.52	49.2	3.41	4.29	<15	0.16	0.47	1.95	45	3.58	12.3
FRO003	7.1	518	333	261	318.4	<0.03	0.146	0.01	-	14.9	35.5	74.8	7.22	34.5	0.42	1	18.4	2.89	12.2	14.1
FRO005	6.72	608	386	270	329.4	<0.03	0.014	0.009	-	30.7	30.3	89.8	13.3	707	0.26	0.48	16.8	22.2	15.5	14.4
FRO006	4.7	21	29.5	7.4	9.0	<0.03	0.012	0.016	-	3.25	13	0.17	1.43	108	0.11	<0.46	0.19	1.18	1.15	8.4
FRO007	5.76	98	83	43.6	53.2	<0.03	<0.01	0.348	-	11.5	<8.8	5.24	2.55	299	0.38	<0.46	7.35	49.6	1.82	12.1
FRO008	6.6	388	254	203	247.7	0.042	<0.01	0.029	-	6.28	80	71.1	2.52	80.3	0.25	0.8	6.6	100	5.86	19.4
FRO009	6.99	372	248	193	235.5	<0.03	<0.01	0.022	-	8.55	20	73.9	3.05	19.2	0.15	<0.46	4.88	75	2.72	13.2
FRO010	7.14	437	283	235	286.7	<0.03	0.057	0.026	-	3.24	65.9	52.5	4.99	36.8	0.29	0.84	24.4	<0.5	3.16	25.3
FRO011	4.49	26	51	3.9	4.8	<0.03	0.071	0.015	-	4	30.6	0.51	2.2	<15	0.13	0.8	0.59	57.2	1.6	11.8
FRO012	7.08	441	288	220	268.4	<0.03	0.312	0.015	0.012	14.9	20.4	64.4	6.83	2.24	0.35	0.99	13.9	10.3	8.19	17.9
FRO013	7.33	649	389	262	319.6	<0.03	0.508	0.011	<0.01	33.2	47.9	90.1	16.2	5.84	0.28	0.58	20.6	8.7	16.4	16.1
FRO014	8.14	378	252	156	190.3	<0.03	5.58	0.02	0.018	15.1	24.1	48.3	11.5	0.63	0.53	0.7	12.1	0.94	10.4	17.4
FRO015	7.66	442	286	150	183.0	<0.03	12.8	0.037	0.038	21.2	39.5	61.2	12.4	0.81	0.31	1.18	14.9	1.54	3.58	19.1
FRO016	7.18	512	295	239	291.6	<0.03	0.241	0.011	<0.01	33.7	75.4	58.5	4.9	0.26	1.58	5.38	28.3	0.63	5.03	9.73
FRO017	7.42	432	269	189	230.6	<0.03	1.07	0.016	0.014	32.2	30.2	68.2	6.63	1.3	0.44	1.21	10.8	0.24	5.24	13
FRO018	7.53	478	272	238	290.4	<0.03	0.08	0.011	0.01	15	35.1	53.2	9.73	13.3	0.49	1.54	28.3	16.9	5.33	10.4
FRO019	7.45	392	219	196	239.1	<0.03	0.021	0.011	0.011	13.6	37.3	46.9	4.23	97.8	0.47	1.85	21.1	26.7	1.85	11.3
FRO020	5.84	192	134	28.4	34.6	<0.03	4.73	0.01	0.102	27.9	27.8	14.1	12.5	55.1	0.41	0.77	8.17	96.1	6.72	18.4
FRO021	6.88	404	254	163	198.9	<0.03	4.36	0.123	0.131	19.2	18.6	52.4	15.1	1.37	0.43	1.71	12.8	18.8	9.49	17.6
FRO022	7.49	239	153	106	129.3	<0.03	1.26	0.029	0.03	9.65	5.69	23.8	5.64	1.47	0.48	0.87	14.1	2.42	2.04	16.6
FRO023	7.05	104	68	35.9	43.8	0.055	0.097	0.03	0.03	13.8	33.2	13.8	1.78	<20	0.19	2.17	3.99	76.7	2.13	10.7
FRO024	7.03	34	42	4.8	5.9	<0.03	<0.01	0.01	0.033	10.5	8.85	2.04	2.09	49.8	0.16	0.57	1.47	31.2	1.42	13.3
FRO025	6.71	381	240	175	213.5	0.033	<0.01	0.015	0.014	27.3	25.1	77.3	3.74	<20	0.15	0.84	9.79	113	7.95	19.6
FRO026	4.93	19	18.5	5.6	6.8	<0.03	<0.01	0.009	0.01	3.53	4.81	0.61	1.55	<20	0.11	0.49	0.32	22.3	1.26	11.4
FRO027	5.65	79	61.5	<1	0.6	0.047	0.014	0.023	0.557	16.7	2.14	4.15	2.35	5910	0.26	1.23	2.68	735	1.62	13.4
FRO028	6.54	163	125	52.3	63.8	<0.03	1.31	0.024	0.024	4.98	110	13.2	14.9	<20	0.09	1.48	3.3	<0.2	18.5	46.3
FRO029	6.27	265	169	62.3	76.0	<0.03	1.59	0.015	0.016	17.9	129	23.1	24.2	2810	0.12	2.78	8.3	137	20.7	39.5
FRO030	6.32	89	88.5	25.1	30.6	<0.03	2.74	0.028	0.027	2.19	37.5	4.8	5.83	26.1	0.13	1.21	1.69	1.08	8.65	38.3
Min.	4.49	19	18.5	<1	0.6	<0.03	<0.01	0.009	<0.01	2.19	<8.8	0.17	1.43	0.26	0.09	<0.46	0.19	<0.2	1.15	8.4
Max.	8.14	649	389	270	329.4	0.055	12.8	0.348	0.557	33.7	129	90.1	24.2	5910	1.58	5.38	28.3	735	20.7	46.3
Mean	6.68	299.79	195.90	128.94	157.31	0.02	1.53	0.03	0.06	14.91	36.69	40.49	7.50	356.29	0.33	1.15	10.64	57.07	6.56	17.39

State of Arkansas
Department of Environmental Quality

"To protect, enhance and restore the natural environment for the well-being of all Arkansans."