

**AUTHORIZATION TO DISCHARGE WASTEWATER UNDER
THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND
THE ARKANSAS WATER AND AIR POLLUTION CONTROL ACT**

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended, Ark. Code Ann. 8-4-101 et seq.), and the Clean Water Act (33 U.S.C. § 1251 et seq.),

The applicant's mailing address and the facility address is:

City of Benton
616 West Hazel
Benton, AR 72015

is authorized to discharge from a facility located as follows: south on Sevier Street at I-30 exit to South Street, then to Richards, turn right onto Hazel from Richards, in Section 15, Township 2 South, Range 15 West in Saline County, Arkansas.

Latitude: 34° 33' 18"; Longitude: 92° 35' 38"

to receiving waters named:

unnamed tributary of Depot Creek, thence to Depot Creek, thence to the Saline River in Segment 2C of the Ouachita River Basin.

The outfall is located at the following coordinates:

Outfall 001: Latitude: 34° 33' 6"; Longitude: 92° 35' 36"

Discharge shall be in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, and IV hereof.

Issue Date:	September 30, 2008
Effective Date:	October 1, 2008
Minor Modification Issue Date:	October 17, 2008
Minor Modification Effective Date:	October 17, 2008
Expiration Date:	September 30, 2013



Steven L. Drown
Chief, Water Division
Arkansas Department of Environmental Quality

**PART I
PERMIT REQUIREMENTS**

SECTION A. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 001 - treated municipal wastewater with a design flow of 6.3 MGD.

The permittee is authorized to discharge from Outfall 001 with a design flow of 6.3 MGD in accordance with the Final Effluent Limits in the following table. Such discharges shall be limited and monitored by the permittee as specified below from a treatment system consisting of a fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and chlorination with a design flow of 6.3 MGD.

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)	Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
		Monthly Avg.	Monthly Avg.		
Flow ¹	N/A	Report	Report	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5)					
(May-Oct)	525	10	15	three/week	24-hr composite
(Nov-Apr)	788	15	22.5	three/week	24-hr composite
Total Suspended Solids (TSS)	788	15	22.5	three/week	24-hr composite
Ammonia Nitrogen (NH3-N)					
(April)	110	2.1	5.2	three/week	24-hr composite
(May-Oct)	79	1.5	2.3	three/week	24-hr composite
(Nov-March)	210	4	6	three/week	24-hr composite
Dissolved Oxygen ²					
(May-Oct)	N/A	7.0, (Monthly Avg. Min.)		three/week	Grab
(Nov-Apr)	N/A	7.5, (Monthly Avg. Min.)		three/week	Grab
Fecal Coliform Bacteria (FCB)		(colonies/100ml)			
(Apr-Sept)	N/A	200	400	three/week	Grab
(Oct-Mar)	N/A	1000	2000	three/week	Grab
Total Residual Chlorine (TRC) ³	N/A	<0.1 mg/l (Inst. Max.)		three/week	Grab
Total Hardness ⁴	N/A	41, (Inst. Min.)		once/month	Grab
Total Phosphorus (TP)	N/A	Report	Report	three/week	Grab
Total Nitrate + Nitrite Nitrogen (as N)	N/A	Report	Report	three/week	Grab
pH	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	three/week	Grab
Chronic Biomonitoring ⁵	N/A	N/A	N/A	once/quarter	24-hr composite

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)	Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
		Monthly Avg.	Monthly Avg.		
<u>Pimephales promelas (Chronic)</u> ⁵ Pass/Fail Lethality (7-day NOEC) TLP6C Pass/Fail Growth (7-day NOEC)TGP6C Survival (7-day NOEC) TOP6C Coefficient of Variation TQP6C Growth (7-day NOEC) TPP6C			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %	once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite
<u>Ceriodaphnia dubia (Chronic)</u> ⁵ Pass/Fail Lethality (7-day NOEC) TLP3B Pass/Fail production (7-day NOEC)TGP3B Survival (7-day NOEC) TOP3B Coefficient of Variation TQP3B Reproduction (7-day NOEC) TPP3B			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %	once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite

- 1 Report monthly average and daily maximum as MGD.
- 2 Instantaneous Minimum. Dissolved Oxygen must be equal or exceed the permit limit at all times.
- 3 See Condition No. 10 of Part II. The TRC limit will be removed after the new ultraviolet disinfection system is operational.
- 4 The Total Hardness limit replaces the Total Recoverable Copper limit from the previous permit.
- 5 See Condition No. 9 of Part II.

There shall be no discharge of distinctly visible solids, scum, or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits, or sludge banks. There shall be no visible sheen due to the presence of oil (Sheen means an iridescent appearance on the surface of the water).

Samples taken in compliance with the monitoring requirements specified above shall be taken after the final treatment unit and at the following monitoring coordinates: Latitude 34° 33' 10", Longitude 92° 35' 36".

**PART I
PERMIT REQUIREMENTS**

SECTION A. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 001 - treated municipal wastewater with a design flow of 8.3 MGD.

The permittee is authorized to discharge from Outfall 001 with a design flow of 8.3 MGD in accordance with the Final Effluent Limits in the following table. Such discharges shall be limited and monitored by the permittee as specified below from a treatment system consisting of a fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and ultraviolet disinfection with a design flow of 8.3 MGD.

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)	Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
		Monthly Avg.	Monthly Avg.		
Flow ¹	N/A	Report	Report	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5) (May-Oct)	692	10	15	three/week	24-hr composite
(Nov-Apr)	1038	15	22.5	three/week	24-hr composite
Total Suspended Solids (TSS)	1038	15	22.5	three/week	24-hr composite
Ammonia Nitrogen (NH3-N) (April)	145	2.1	5.2	three/week	24-hr composite
(May-Oct)	104	1.5	2.3	three/week	24-hr composite
(Nov-March)	277	4	6	three/week	24-hr composite
Dissolved Oxygen ² (May-Oct)	N/A	7.0, (Monthly Avg. Min.)		three/week	Grab
(Nov-Apr)	N/A	7.5, (Monthly Avg. Min.)		three/week	Grab
Fecal Coliform Bacteria (FCB) (Apr-Sept)	N/A	200	400	three/week	Grab
(Oct-Mar)	N/A	1000	2000	three/week	Grab
Total Hardness ⁴	N/A	41, (Inst. Min.)		once/month	Grab
Total Phosphorus (TP)	N/A	Report	Report	three/week	Grab
Total Nitrate + Nitrite Nitrogen (as N)	N/A	Report	Report	three/week	Grab
pH	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	three/week	Grab
Chronic Biomonitoring ⁵	N/A	N/A	N/A	once/quarter	24-hr composite

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- 1 Report monthly average and daily maximum as MGD.
- 2 Instantaneous Minimum. Dissolved Oxygen must be equal or exceed the permit limit at all times.
- 3 See Condition No. 10 of Part II.
- 4 The Total Hardness limit replaces the Total Recoverable Copper limit from the previous permit.
- 5 See Condition No. 9 of Part II.

There shall be no discharge of distinctly visible solids, scum, or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits, or sludge banks. There shall be no visible sheen due to the presence of oil (Sheen means an iridescent appearance on the surface of the water).

Samples taken in compliance with the monitoring requirements specified above shall be taken after the final treatment unit and at the following monitoring coordinates: Latitude 34° 33' 10", Longitude 92° 35' 36".

SECTION B. PERMIT COMPLIANCE

The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

1. Compliance is required on the effective date of the permit.
2. The permittee must sample the wastewater treatment plant's influent and effluent in accordance with the provisions in Part II.7.C once/two (2) months for one year following the effective date of the permit.
3. The permittee must submit annual reports of biosolids analysis in accordance with Part II.8.B.1.b(1) prior to May 1st of each year.

PART II OTHER CONDITIONS

1. The operator of this wastewater treatment facility shall be licensed as Class IV by the State of Arkansas in accordance with Act 211 of 1971, Act 1103 of 1991, Act 556 of 1993, and APCEC Regulation No. 3, as amended.
2. For publicly owned treatment works, the 30-day average percent removal for Carbonaceous Biochemical Oxygen Demand (CBOD5) and Total Suspended Solids shall not be less than 85 percent unless otherwise authorized by the permitting authority in accordance with 40 CFR Part 133.102, as adopted by reference in APCEC Regulation No. 6.
3. The permittee shall give at least 120 days prior notice to the Director of any change planned in the permittee's sludge disposal practice or land use applications, including types of crops grown (if applicable).
4. The permittee shall report all overflows with the Discharge Monitoring Report (DMR) submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of overflow; observed environmental impacts from the overflow; action taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary). All overflows which endanger health or the environment shall be orally reported to this department (Enforcement Section of the Water Division), within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows which endanger health or the environment, shall be provided within 5 days of the time the permittee becomes aware of the circumstance.
5. In accordance with 40 CFR Parts 122.62 (a)(2) and 124.5, this permit may be reopened for modification or revocation and/or reissuance to require additional monitoring and/or effluent limitations when new information is received that actual or potential exceedance of State water quality criteria and/or narrative criteria are determined to be the result of the permittee's discharge(s) to a relevant water body or a Total Maximum Daily Load (TMDL) is established or revised for the water body that was not available at the time of the permit issuance that would have justified the application of different permit conditions at the time of permit issuance.
6. Other Specified Monitoring Requirements

The permittee may use alternative appropriate monitoring methods and analytical instruments other than as specified in Part I Section A of the permit without a major permit modification under the following conditions:

- The monitoring and analytical instruments are consistent with accepted scientific practices;

- The requests shall be submitted in writing to the Permits Section of the Water Division of the ADEQ for use of the alternate method or instrument.
- The method and/or instrument is in compliance with 40 CFR Part 136 or acceptable to the Director; and
- All associated devices are installed, calibrated, and maintained to insure the accuracy of the measurements and are consistent with the accepted capability of that type of device. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

Upon written approval of the alternative monitoring method and/or analytical instruments, these methods or instruments must be consistently utilized throughout the monitoring period. ADEQ must be notified in writing and the permittee must receive written approval from ADEQ if the permittee decides to return to the original permit monitoring requirements.

7. Contributing Industries and Pretreatment Requirements

A. The following pollutants may not be introduced into the treatment facility:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;
2. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works are specifically designed to accommodate such discharges;
3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, resulting in Interference;
4. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;
5. Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 deg. C (104 deg. F) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;
6. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and
 8. Any trucked or hauled pollutants, except at discharge points designated by the POTW.
- B. The permittee shall require any indirect discharger to the treatment works to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Act, including any requirements established under 40 CFR Part 403.
- C. The permittee shall sample, analyze and report the wastewater plant's influent (prior to any return activated sludge or other treatment mixing streams), the plant's effluent after final treatment and sludge on a dry weight basis (if not generating nor land applying, please state – sludge analysis/reports not required) once/month for Molybdenum, Selenium and the parameters in Table III, 40 CFR 122 Appendix D using EPA approved methods in 40 CFR 136. This monitoring and reporting requirement shall be for a one (1) year period from the effective date of this permit.

The permittee shall sample and analyze representative domestic background wastewater for the same parameters as above once/two (2) months over this same period of time for a total of six (6) reports.

The reports shall be sent to the attention of the ADEQ Pretreatment Coordinator denoting samples as 24 hour composites (time or flow weighted) or grab when not applicable (Cyanide, Phenols, etc.) or deemed unfeasible. The table below includes the quantitation levels (MQL) that shall be required of your ADEQ certified lab(s). The analyses may be summarized and reported after that twelve month period on the table(s) in Attachment 2.

METALS AND CYANIDE	REQUIRED MQL ($\mu\text{g/L}$)
Antimony , Total Recoverable	60
Arsenic , Total Recoverable	0.5
Beryllium, Total Recoverable	0.5
Cadmium , Total Recoverable	0.5
Chromium Total Recoverable	10
Chromium (6+) Dissolved	10
Copper, Total Recoverable	0.5
Lead, Total Recoverable	0.5

METALS AND CYANIDE	REQUIRED MQL ($\mu\text{g/L}$)
Mercury, Total Recoverable	0.005
Nickel, Total Recoverable	0.5
Selenium, Total Recoverable	5
Silver, Total Recoverable	0.5
Thallium, Total Recoverable	0.5
Zinc, Total Recoverable	20
Phenols, Total Recoverable	5
Cyanide, Total Recoverable	10

D. The permittee shall provide adequate notice to the Department of the following:

1. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 or 306 of the Act if it were directly discharging those pollutants; and
2. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.
3. Any notice shall include information on (i) the quality and quantity of effluent to be introduced into the treatment works, and (ii) any anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

8. **ADDITIONAL CONDITIONS FOR LAND APPLICATION OF BIOSOLIDS**

The sludge produced at the treatment plant will be disposed at the following location(s):

Field No.	Section	Township	Range	Total Acres
1	32	1 South	15 West	62
2	32	1 South	15 West	80
3	32	1 South	15 West	80
4	9	2 South	15 West	48
5	9	2 South	15 West	80

A. **GENERAL REQUIREMENTS:**

1. Only biosolids which are not classified as a hazardous waste under state or federal regulations may be land applied.

2. Nutrients contained in the biosolids will not be applied at a rate exceeding the annual nutrient uptake of the crop. At no time will the nutrient application rate be allowed to exceed the site specific rate approved by the Department.
3. Biosolids with Polychlorinated Biphenyls (PCB's) concentrations equal or greater than 50 mg/kg (dry basis) will not be land applied at any time.
4. CEILING CONCENTRATIONS (milligrams per kilogram, dry weight basis): If the biosolids to be land applied exceed any of the pollutant concentrations listed in **Table 1** below, the biosolids shall not be land applied.

TABLE 1	
Element	Concentration (mg/kg)
Arsenic	75
Cadmium	85
Chromium	*
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

* This value is being reevaluated by US EPA

5. POLLUTANTS LIMITS: When bulk biosolids are applied to agricultural land, forest, a public contact site, or reclamation site, the permittee shall not exceed the Cumulative Pollutant Loading Rate values listed in **Table 2**, or the Pollutant Concentration values listed in **Table 3**.

TABLE 2		
Element	Cumulative Pollutant Loading Rate	
	Kg/ha	lbs/ac
Arsenic	41	37
Cadmium	39	35
Chromium	*	*
Copper	1,500	1,350
Lead	300	270

TABLE 2		
Element	Cumulative Pollutant Loading Rate	
	Kg/ha	lbs/ac
Mercury	17	15
Molybdenum	*	*
Nickel	420	378
Selenium	100	90
Zinc	2,800	2,520

*These values are being reevaluated by US EPA.

TABLE 3	
Element	Monthly Average Concentration (mg/kg)
Arsenic	41
Cadmium	39
Chromium	*
Copper	1,500
Lead	300
Mercury	17
Molybdenum	*
Nickel	420
Selenium	36
Zinc	2,800

*These values are being reevaluated by US EPA.

6. The biosolids generator must issue a signed certification stating that the Pathogen Reduction, Vector Attraction Reduction, and Pollutant Concentration Limits have been met. The State requirements on Pathogen Reduction, Vector Attraction Reduction, and Pollutant Concentration Limits are the same as those listed in 40 CFR Part 503. All the above information must be made available to the land-applicator before the biosolids materials are delivered. Concurrently, a signed copy of each certification must be also submitted to the Permits Section of the ADEQ Water Division.
7. Biosolids can only be stored in accordance with the permit and the approved waste management plan, if provisions are made in the plan for that purpose. The utilization of improvised field storage sites or any other site not approved by the Department is strictly prohibited.

8. Transportation of the biosolids must be such that will prevent the attraction, harborage or breeding of insects or rodents. It must not produce conditions harmful to public health, the environment, odors, unsightliness, nuisances, or safety hazards.
9. The containers used for the transportation of the biosolids must be of the closed type. Transportation equipment must be leak-proof and kept in a top sanitary condition at all times. Biosolids must be enclosed or covered as to prevent littering, vector attraction, or any other nuisances.
10. The permittee will be responsible for assuring that the land owner, of any land application site not owned by the permittee, and the waste applicator, if different from the permittee, abide by the conditions of this permit.
11. Biosolids will be spread evenly over the application area and in no way biosolids will be allowed to enter the waters of the State.
12. Biosolids will not be applied to slopes with a gradient greater than 15%; or to soils that are saturated, frozen or covered with snow, during rain, or when precipitation is imminent.
13. The permittee will not cause any underground drinking water source to exceed the limitations in 40 CFR Part 257, Appendix I.
14. The permittee will not cause or contribute to the taking of life or the destruction or adverse modification of the critical habitat of any known endangered or threatened species of plant, fish or wildlife.
15. The permittee will take all necessary measures to reduce obnoxious and offensive odors. Equipment will be maintained and operated to prevent spillage and leakage.
16. Disposal of [waste] in a flood plain shall not increase the level of the base flood by one foot or more to avoid increasing the velocity of the flow downstream of the site, reducing the temporary storage capacity of the flood plain, or increasing the levels of the flood waters.
17. Biosolids will not be spread within 50 feet of rock outcrops and property lines; 100 feet of lakes, ponds, springs, streams, wetlands and sinkholes; 200 feet of drinking water wells; 300 feet of occupied buildings and streams classified as an "extraordinary resource water body."
18. All new land application sites must have a waste management plan approved by the Department prior to land application of wastewater biosolids. This change normally requires a permit modification.

B. MONITORING AND REPORTING REQUIREMENTS:

1. The permittee will be responsible for the biosolids analyses, soil analyses, and a reporting schedule that must include the following:

a. Biosolids Analysis

(1) Biosolids samples collected must be representative of the treated biosolids to be land applied. The samples are to be stored in appropriate containers and kept refrigerated or frozen to prevent any change in composition.

(2) Quarterly representative samples of the land-applied biosolids will be analyzed and results expressed in dry basis in mg/kg, except as otherwise indicated:

Volatile Solids(%)	Total Kjeldahl Nitrogen
Total Solids(%)	Total Phosphorus
Nitrate +Nitrate Nitrogen	Total Potassium
Ammonia Nitrogen	Arsenic
Cadmium	Copper
Lead	Mercury
Nickel	Selenium
Zinc	pH (SU)

(3) Soils Analysis

Each land application site will be soil tested in the Spring prior to application for the following parameters:

Nitrate-Nitrogen	Potassium
Phosphorus	Magnesium
Arsenic	Cadmium
Copper	Lead
Mercury	Nickel
Selenium	Zinc
pH	
Cation Exchange Capacity (me/100g)	
Salt Content (micro-mohs/cm)	

b. Reporting

- (1) Annual reports will be sent to the Department and to the owner of the land receiving biosolids prior to May 1, which must include the following:

“The biosolids and soil analyses conducted under section a. above (including a statement that the analyses were performed in accordance with EPA Document SW-846, "Test Methods for Evaluation of Solid Waste," or other procedures approved by the Director), application dates and locations, volumes of biosolids applied (in dry tons/acre-year and gallons/acre-year of biosolids), methods of disposal, identity of hauler, and type of crop grown, amounts of nitrogen applied, total elements added that year (lbs/acre), total elements applied to date, and copies of soil analyses for each site.”

- (2) The permittee will also maintain copies of the above records for Department personnel review at the biosolids generating facility.

9. **WHOLE EFFLUENT TOXICITY TESTING (7-DAY CHRONIC NOEC FRESHWATER)**

1. **SCOPE AND METHODOLOGY**

- a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL:	001
CRITICAL DILUTION (%):	100 %
EFFLUENT DILUTION SERIES (%):	32%, 42%, 56%, 75%, & 100%
COMPOSITE SAMPLE TYPE:	Defined at Part I

TEST SPECIES/METHODS: 40 CFR Part 136

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA/600/4-91/002 or the most recent update thereof. This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA/600/4-91/002, or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

- b. The **NOEC** (No Observed Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.
 - c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.
 - d. Test failure is defined as a demonstration of statistically significant sub-lethal or lethal effects to a test species at or below the effluent critical dilution.
2. **PERSISTENT LETHALITY:** The requirements of this subsection apply only when a toxicity test demonstrates significant lethal effects at or below the critical dilution. Significant lethal effects are herein defined as a statistically significant difference at the 95% confidence level between the survival of the appropriate test organism in a specified effluent dilution and the control (0% effluent).

a. Part I Testing Frequency Other Than Monthly

- i. The permittee shall conduct a total of two (2) additional tests for any species that demonstrates significant lethal effects at or below the critical dilution. The two additional tests shall be conducted monthly during the next two consecutive months. The permittee shall not substitute either of the two additional tests in lieu of routine toxicity testing. The full report shall be prepared for each test required by this section in accordance with procedures outlined in Item 5 of this section and submitted with the period DMR to the permitting authority for review.
- ii. If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item 7 of this section. The permittee shall notify ADEQ in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest. A TRE may be also be required due to a demonstration of persistent significant sub-lethal effects or intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests. Monthly retesting is not required if the permittee is performing a TRE.
- iii. If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall henceforth increase the frequency of testing for this species to once per quarter for the life of the permit.
- iv. The provisions of Item 2.a are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 7 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution. A TRE may be also be required due to a demonstration of persistent significant sub-lethal effects or intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

3. **SUB-LETHAL FAILURES:** If a statistically significant sub-lethal effect is demonstrated at or below the critical dilution during any quarterly test, the permittee shall conduct two additional tests. The additional tests shall be conducted monthly during the next two consecutive months. The permittee shall not substitute either of the two additional in lieu of routine toxicity testing.

If during the first four quarters, statistically significant sub-lethal effects are exhibited, quarterly testing will be required for that species until the effluent passes both the lethal and sub-lethal tests endpoints for the affected species, for four consecutive quarters. After passing four consecutive quarters for the affected species the permittee may request a reduction in testing frequency. Monthly retesting is not required if the permittee is performing a TRE.

4. **REQUIRED TOXICITY TESTING CONDITIONS**

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

- i. The toxicity test control (0% effluent) must have survival equal to or greater than 80%.
- ii. The mean number of Ceriodaphnia dubia neonates produced per surviving female in the control (0% effluent) must be 15 or more.
- iii. 60% of the surviving control females must produce three broods.
- iv. The mean dry weight of surviving fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.
- v. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the fathead minnow test.
- vi. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the fathead minnow test.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

- vii. a PMSD range of 13 - 47 for water flea reproduction
- viii. a PMSD range of 12 – 30 for fathead minnow growth

b. **Statistical Interpretation**

- i. For the Ceriodaphnia dubia survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/600/4-91/002 or the most recent update thereof.
- ii. For the Ceriodaphnia dubia reproduction test and the fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/600/4-91/002 or the most recent update thereof.
- iii. If the conditions of Test Acceptability are met in Item 4.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 5 below.

c. **Dilution Water**

- i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;
 - (A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and
 - (B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

- ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 4.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:
 - (A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;
 - (B) the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);
 - (C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 5 below; and
 - (D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. **Samples and Composites**

- i. The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item 1.a above.
- ii. The permittee shall collect second and third composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.
- iii. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.
- iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum

number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 5 of this section.

- v. **MULTIPLE OUTFALLS**: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in Item 1.a above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.
- vi. The permittee shall not allow the sample to be dechlorinated at the laboratory. At the time of sample collection the permittee shall measure the TRC of the effluent. The measured concentration of TRC for each sample shall be included in the lab report submitted by the permittee.

5. **REPORTING**

- a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/600/4-91/002, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of Part II.C.7 of this permit. The permittee shall submit full reports to the Department. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for review.
- b. A valid test for each species must be reported on the DMR during each reporting period specified in Part I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the LOWEST survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and

retests (for tests previously failed) performed during the reporting period must be attached to the DMR for ADEQ review.

- c. The permittee shall submit the results of each valid toxicity test on DMR for that reporting period in accordance with Part II.D.4 of this permit, as follows below. Submit retest information clearly marked as such with the following DMR. Only results of valid tests are to be reported on the DMR.

i. Pimephales promelas (fathead minnow)

- (A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TLP6C.
- (B) If the NOEC for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TGP6C.
- (C) Report the NOEC value for survival, Parameter No. TOP6C.
- (D) Report the NOEC value for growth, Parameter No. TPP6C.
- (E) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.

ii. Ceriodaphnia dubia

- (A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TLP3B.
- (B) If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TGP3B.
- (C) Report the NOEC value for survival, Parameter No. TOP3B.
- (D) Report the NOEC value for reproduction, Parameter No. TPP3B.
- (E) Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.

6. **Monitoring Frequency Reduction**

- a. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for one or both test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution without a major modification. If granted, the monitoring frequency for that test species may be reduced to not less than once per year for the less sensitive species (usually the fathead minnow) and not less than twice per year for the more sensitive test species (usually the Ceriodaphnia dubia).
- b. CERTIFICATION - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in Item 4.a. above. In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub-lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the Department will issue a letter of confirmation of the monitoring frequency reduction. A copy of the letter will be forwarded to the Permit Compliance System section to update the permit reporting requirements.
- c. This monitoring frequency reduction applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.

7. **TOXICITY REDUCTION EVALUATION (TRE)**

- a. Within ninety (90) days of confirming lethality in the retests, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The TRE Action Plan shall lead to the successful elimination of effluent toxicity at the critical dilution and include the following:
 - i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and

confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA-600/6-91/003) and "Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I" (EPA-600/6-91/005F), or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (800) 553-6847, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

- ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 48 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

- iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and
 - iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).
- b. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.
- c. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:
- i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;
 - ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and
 - iii. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution.
- d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

10. If TRC test results are less than Detection Level Achieved (DL), a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

Total residual chlorine (TRC) in the effluent composite sample shall be measured and reported both at the time of sample termination and at the time of toxicity test initiation. The permittee shall ensure that the effluent composite used in toxicity testing is representative of normal facility residual chlorine discharge concentration.

11. In lieu of stormwater pollution prevention plan requirements, a No Exposure Certification (Tracking #ARR00C399) was issued. Under the no exposure certification, any discharge of stormwater not in compliance with the No Exposure Certification requirements is a violation of the permit.
12. Transition Period:

The City of Benton is constructing a new treatment train at the existing wastewater plant which will increase the design flow from 6.3 MGD to 8.3 MGD. The construction will add a new activated sludge oxidation ditch, clarifier, post aeration basin, ultraviolet disinfection chamber, digester, and a return/waste activated sludge pump station with a design flow of 8.3 MGD. The construction will also include improvements to the fine screen. The existing treatment system is: Fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and chlorination with a design flow of 6.3 MGD.

- a. Beginning on the effective date of the permit, the permittee must submit a Discharge Monitoring Report (DMR) for each permitted design flow (i.e., 6.3 MGD and 8.3 MGD) on a monthly basis. The DMR for the 8.3 MGD design flow can be marked and submitted as "No Discharge", until such time as the new treatment train is operational. The permittee must continue to submit two (2) monthly DMRs until the report required in Part II.13.b below is received.
- b. The permittee must notify the ADEQ when the new treatment train is complete and at least 30 days after the discharge at the new design flow has begun.

**PART III
STANDARD CONDITIONS**

SECTION A – GENERAL CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the federal Clean Water Act and the Arkansas Water and Air Pollution Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; and/or for denial of a permit renewal application. **Any values reported in the required Discharge Monitoring Report (DMR) which are in excess of an effluent limitation specified in Part I shall constitute evidence of violation of such effluent limitation and of this permit.**

2. Penalties for Violations of Permit Conditions

The Arkansas Water and Air Pollution Control Act provides that any person who violates any provisions of a permit issued under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year, or a fine of not more than twenty-five thousand dollars (\$25,000) or by both such fine and imprisonment for each day of such violation. Any person who violates any provision of a permit issued under the Act may also be subject to civil penalty in such amount as the court shall find appropriate, not to exceed ten thousand dollars (\$10,000) for each day of such violation. The fact that any such violation may constitute a misdemeanor shall not be a bar to the maintenance of such civil action.

3. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:

- a. Violation of any terms or conditions of this permit;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- c. A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- d. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.
- e. Failure of the permittee to comply with the provisions of APCEC Regulation No. 9 (Permit fees) as required by Part III.A.10, herein.

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

4. Toxic Pollutants

Notwithstanding Part III.A.3, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under APCEC Regulation No. 2, as amended, or Section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitations on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standards or prohibition and the permittee so notified.

The permittee shall comply with effluent standards, narrative criteria, or prohibitions established under APCEC Regulation No. 2, as amended, or Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

5. Civil and Criminal Liability

Except as provided in permit conditions on “Bypassing” (Part III.B.4.a), and “Upsets” (Part III.B.5.b), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of this permit or applicable state and federal statutes or regulations which defeats the regulatory purposes of the permit may subject the permittee to criminal enforcement pursuant to the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

6. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 of the Clean Water Act.

7. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Clean Water Act.

8. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

9. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

10. Permit Fees

The permittee shall comply with all applicable permit fee requirements for wastewater discharge permits as described in APCEC Regulation No. 9 (Regulation for the Fee System for Environmental Permits). Failure to promptly remit all required fees shall be grounds for the Director to initiate action to terminate this permit under the provisions of 40 CFR Parts 122.64 and 124.5(d), as adopted in APCEC Regulation No. 6 and the provisions of APCEC Regulation No. 8.

SECTION B – OPERATION AND MAINTENANCE OF POLLUTION CONTROLS**1. Proper Operation and Maintenance**

- a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- b. The permittee shall provide an adequate operating staff which is duly qualified to carryout operation, maintenance, and testing functions required to insure compliance with the conditions of this permit.

2. Need to Halt or Reduce not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power for the treatment facility is reduced, is lost, or alternate power supply fails.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment or the water receiving the discharge.

4. Bypass of Treatment Facilities**a. Bypass not exceeding limitation:**

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.B.4.b and 4.c.

b. Notice:

- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
- (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part III.D.6 (24-hour notice).

c. Prohibition of bypass:

- (1) Bypass is prohibited and the Director may take enforcement action against a permittee for bypass, unless:
 - (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee could have installed

adequate backup equipment to prevent a bypass which occurred during normal or preventive maintenance; and

(c) The permittee submitted notices as required by Part III.B.4.b.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Part III.B.4.c(1).

5. Upset Conditions

- a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Part III.B.5.b of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- b. Conditions necessary for demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the specific cause(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required by Part III.D.6; and
 - (4) The permittee complied with any remedial measures required by Part III.B.3.
- c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State. Written approval must be obtained from the ADEQ for land application only.

7. Power Failure

The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators, or retention of inadequately treated effluent.

SECTION C – MONITORING AND RECORDS

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director. Intermittent discharges shall be monitored.

2. Flow Measurement

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than +/-10% from true discharge rates throughout the range of expected discharge volumes and shall be installed at the monitoring point of the discharge.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals frequent enough to insure accuracy of measurements and shall insure that both calibration and maintenance activities will be conducted. An adequate analytical quality control program, including the analysis of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory. At a minimum, spikes and duplicate samples are to be analyzed on 10% of the samples.

4. Penalties for Tampering

The Arkansas Water and Air Pollution Control Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year or a fine of not more than ten thousand dollars (\$10,000) or by both such fine and imprisonment.

5. Reporting of Monitoring Results

Monitoring results must be reported on a Discharge Monitoring Report (DMR) form (EPA No. 3320-1). Permittees are required to use preprinted DMR forms provided by ADEQ, unless specific written authorization to use other reporting forms is obtained from ADEQ. Monitoring results obtained during the previous calendar month shall be summarized and reported on a DMR form postmarked no later than the 25th day of the month following the completed reporting period to begin on the effective date of the permit. Duplicate copies of DMR forms signed and certified as required by Part III.D.11 and all other reports required by Part III.D, shall be submitted to the Director at the following address:

Permits Enforcement Branch
Water Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

If permittee uses outside laboratory facilities for sampling and/or analysis, the name and address of the contract laboratory shall be included on the DMR.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated on the DMR.

7. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time.

8. Record Contents

Records and monitoring information shall include:

- a. The date, exact place, time and methods of sampling or measurements, and preservatives used, if any;
- b. The individuals(s) who performed the sampling or measurements;
- c. The date(s) and time analyses were performed;

- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The measurements and results of such analyses.

9. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and
- d. Sample, inspect, or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION D – REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall give notice and provide plans and specification to the Director for review and approval prior to any planned physical alterations or additions to the permitted facility. Notice is required only when:

Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that cause violation of the effluent limitations specified herein.

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers

The permit is nontransferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. Monitoring Reports

Monitoring results shall be reported at the intervals and in the form specified in Part III.C.5. **Discharge Monitoring Reports must be submitted even when no discharge occurs during the reporting period.**

5. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

6. Twenty-four Hour Report

- a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain the following information:
 - (1) A description of the noncompliance and its cause;
 - (2) The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
 - (3) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
- b. The following shall be included as information which must be reported within 24 hours:
 - (1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

- (2) Any upset which exceeds any effluent limitation in the permit; and
 - (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part I of the permit to be reported within 24 hours to the Enforcement Section of the Water Division of the ADEQ.
- c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours to the Enforcement Section of the Water Division of the ADEQ.

7. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Parts II.D.4, 5, and 6, at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.6.

8. Changes in Discharge of Toxic Substances for Industrial Dischargers

The permittee shall notify the Director as soon as he/she knows or has reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the “notification levels” described in 40 CFR Part 122.42(a)(1); or
- b. That any activity has occurred or will occur which would result in any discharge on a non-routine or infrequent basis of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the “notification levels” described in 40 CFR Part 122.42(a)(2).

9. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit. Information shall be submitted in the form, manner and time frame requested by the Director.

10. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The complete application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated in APCEC Regulation No. 6.

11. Signatory Requirements

All applications, reports, or information submitted to the Director shall be signed and certified as follows:

a. All **permit applications** shall be signed as follows:

- (1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
 - (ii) The manager of one or more manufacturing, production, or operation facilities, provided: the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- (2) For a partnership or sole proprietorship: by a general partner or proprietor, respectively; or
- (3) For a municipality, State, Federal, or other public agency, by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
 - (i) The chief executive officer of the agency, or
 - (ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

- b. All **reports** required by the permit and **other information** requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- (1) The authorization is made in writing by a person described above.
 - (2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - (3) The written authorization is submitted to the Director.

- c. Certification. Any person signing a document under this section shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

12. Availability of Reports

Except for data determined to be confidential under 40 CFR Part 2 and APCEC Regulation No. 6, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Environmental Quality. As required by the Regulations, the name and address of any permit applicant or permittee, permit applications, permits, and effluent data shall not be considered confidential.

13. Penalties for Falsification of Reports

The Arkansas Air and Water Pollution Control Act provides that any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this permit shall be subject to civil penalties specified in Part III.A.2 and/or criminal penalties under the authority of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

PART IV DEFINITIONS

All definitions contained in Section 502 of the Clean Water Act shall apply to this permit and are incorporated herein by reference. Additional definitions of words or phrases used in this permit are as follows:

1. **“Act”** means the Clean Water Act, Public Law 95-217 (33.U.S.C. 1251 et seq.) as amended.
2. **“Administrator”** means the Administrator of the U.S. Environmental Protection Agency.
3. **“Applicable effluent standards and limitations”** means all State and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards of performance, toxic effluent standards and prohibitions, and pretreatment standards.
4. **“Applicable water quality standards”** means all water quality standards to which a discharge is subject under the federal Clean Water Act and which has been (a) approved or permitted to remain in effect by the Administrator following submission to the Administrator pursuant to Section 303(a) of the Act, or (b) promulgated by the Director pursuant to Section 303(b) or 303(c) of the Act, and standards promulgated under (APCEC) Regulation No. 2, as amended.
5. **“Bypass”** means the intentional diversion of waste streams from any portion of a treatment facility.
6. **“Daily Discharge”** means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.
Mass Calculations: For pollutants with limitations expressed in terms of mass, the “daily discharge” is calculated as the total mass of pollutant discharged over the sampling day.
Concentration Calculations: For pollutants with limitations expressed in other units of measurement, determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the “daily discharge” determination of concentration shall be the arithmetic average (weighted by flow value) of all the samples collected during that sampling day by using the following formula: where C = daily concentration, F = daily flow and n = number of daily samples

$$\frac{C_1F_1 + C_2F_2 + \dots + C_nF_n}{F_1 + F_2 + \dots + F_n}$$

7. **“Monthly average”** means the highest allowable average of “daily discharges” over a calendar month, calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month. For Fecal Coliform Bacteria (FCB) report the monthly average (see 30-day average below).
8. **“Daily Maximum”** discharge limitation means the highest allowable “daily discharge” during the calendar month. The 7-day average for Fecal Coliform Bacteria (FCB) is the

geometric mean of the values of all effluent samples collected during the calendar week in colonies per 100 ml.

9. **“Department”** means the Arkansas Department of Environmental Quality (**ADEQ**).
10. **“Director”** means the Administrator of the U.S. Environmental Protection Agency and/or the Director of the Arkansas Department of Environmental Quality.
11. **“Grab sample”** means an individual sample collected in less than 15 minutes in conjunction with an instantaneous flow measurement.
12. **“Industrial User”** means a non-domestic discharger, as identified in 40 CFR Part 403, introducing pollutants to a POTW.
13. **“National Pollutant Discharge Elimination System”** means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under Sections 307, 402, 318, and 405 of the Clean Water Act.
14. **“POTW”** means a Publicly Owned Treatment Works.
15. **“Severe property damage”** means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in products.
16. **“APCEC”** means the Arkansas Pollution Control and Ecology Commission.
17. **“Sewage sludge”** means the solids, residues, and precipitate separated from or created in sewage by the unit processes at a POTW. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff that are discharged to or otherwise enter a POTW.
18. **“7-day average”** discharge limitation, other than for Fecal Coliform Bacteria (FCB), is the highest allowable arithmetic mean of the values for all effluent samples collected during the calendar week. The 7-day average for Fecal Coliform Bacteria (FCB) is the geometric mean of the values of all effluent samples collected during the calendar week in colonies/100 ml. The Discharge Monitoring Report should report the highest 7-day average obtained during the calendar month. For reporting purposes, the 7-day average values should be reported as occurring in the month in which the Saturday of the calendar week falls in.
19. **“30-day average”**, other than for Fecal Coliform Bacteria (FCB), is the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The 30-day average for Fecal Coliform Bacteria (FCB) is the geometric mean of the values for all effluent samples collected during a calendar month. For Fecal Coliform Bacteria (FCB), report the monthly average as a 30-day geometric mean in colonies per 100 ml.
20. **“24-hour composite sample”** consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.
21. **“12-hour composite sample”** consists of 12 effluent portions, collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.

22. **“6-hour composite sample”** consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.
23. **“3-hour composite sample”** consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.
24. **“Treatment works”** means any devices and systems used in storage, treatment, recycling, and reclamation of municipal sewage and industrial wastes, of a liquid nature to implement section 201 of the Act, or necessary to recycle reuse water at the most economic cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities, and any works, including site acquisition of the land that will be an integral part of the treatment process or is used for ultimate disposal of residues resulting from such treatment.
25. **“Upset”** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. Any upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventive maintenance, or careless of improper operations.
26. **“For Fecal Coliform Bacteria (FCB)”**, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads. For Fecal Coliform Bacteria (FCB) report the monthly average as a 30-day geometric mean in colonies per 100 ml.
27. **“Dissolved oxygen limit”**, shall be defined as follows:
 - a. When limited in the permit as a minimum monthly average, shall mean the lowest acceptable monthly average value, determined by averaging all samples taken during the calendar month;
 - b. When limited in the permit as an instantaneous minimum value, shall mean that no value measured during the reporting period may fall below the stated value.
28. **The term “MGD”** shall mean million gallons per day.
29. **The term “mg/l”** shall mean milligrams per liter or parts per million (ppm).
30. **The term “µg/l”** shall mean micrograms per liter or parts per billion (ppb).
31. **The term “cfs”** shall mean cubic feet per second.
32. **The term “ppm”** shall mean parts per million.
33. **The term “s.u.”** shall mean standard units.
34. **The term “Instantaneous Maximum”** when limited in the permit as an instantaneous maximum value, shall mean that no value measured during the reporting period may fall above the stated value.
35. **Monitoring and Reporting:**

When a permit becomes effective, monitoring requirements are of the immediate period of the permit effective date. Where the monitoring requirement for an effluent characteristic is monthly or more frequently, the Discharge Monitoring Report (DMR) shall be submitted by the 25th of the month following the sampling. Where the monitoring requirement for an effluent characteristic is Quarterly, Semi-Annual, Annual,

or Yearly, the DMR shall be submitted by the 25th of the month following the monitoring period end date.

MONTHLY:

Is defined as a calendar month or any portion of a calendar month for monitoring requirement frequency of once/month or more frequently.

QUARTERLY:

- (1) Is defined as a fixed calendar quarter or any part of the fixed calendar quarter for a non-seasonal effluent characteristic with a measurement frequency of once/quarter. Fixed calendar quarters are: January through March, April through June, July through September, and October through December; or
- (2) Is defined as a fixed three month period (or any part of the fixed three month period) of or dependent upon the seasons specified in the permit for a seasonal effluent characteristic with a monitoring requirement frequency of once/quarter that does not coincide with the fixed calendar quarter. Seasonal calendar quarters are: May through July, August through October, November through January, and February through April.

SEMI-ANNUAL:

Is defined as the fixed time periods January through June, and July through December (or any portion thereof) for an effluent characteristic with a measurement frequency of once/6 months or twice/year.

ANNUAL or YEARLY:

Is defined as a fixed calendar year or any portion of the fixed calendar year for an effluent characteristic or parameter with a measurement frequency of once/year. A calendar year is January through December, or any portion thereof.

36. **The term “Weekday”** means Monday – Friday.



Attachment 1
Pre-Treatment Form

MONITORING RESULTS (1) FOR THE ANNUAL PRETREATMENT REPORT
REPORTING YEAR: _____, 20 TO _____, 20
TREATMENT PLANT: City of _____ NPDES PERMIT #AR00
AVERAGE POTW FLOW: _____ MGD % IU FLOW: _____%

METALS, CYANIDE and PHENOLS (Total)	MAHL mg/l (2)	Influent Dates Sampled (mg/l) Once/quarter				WQ level/limit mg/l (2)	Effluent Dates Sampled (mg/l) Once/quarter				Laboratory Analysis (See Attachment PPS)	
											EPA Method Used (1)	Detection Level Achieved (ug/l)
Antimony	N/A					N/A						
Cadmium												
Copper												
Lead												
Mercury												
Nickel												
Selenium												
Silver												
Zinc												
Chromium												
Cyanide												
Arsenic						N/A						
Molybdenum						N/A						
Phenols	N/A					N/A						
Beryllium	N/A					N/A						
Thallium	N/A					N/A						
Flow, MGD	N/A					N/A						

- (1) It is advised that the influent and effluent samples are collected considering flow detention time through each plant. **Analytical MQLs should be used so that the data can also be used for Local Limits assessment and NPDES application purpose.**
- (2) This value was calculated during the development of TBLL based on State WQ Standards and implementation procedures.

MAHL - Maximum Allowable Headworks Level
WQ - Water Quality

Final Fact Sheet

for renewal of the discharge Permit Number AR0036498 to discharge to Waters of the State

1. PERMITTING AUTHORITY.

The issuing office is:

Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT.

The applicant's mailing address and the facility address is:

City of Benton
616 West Hazel
Benton, AR 72015

3. PREPARED BY.

The permit was prepared by:

Kimberly A. Fuller, PE, CPESC
Staff Engineer
Discharge Permits Section, Water Division
Telephone: (501) 682-0643
E-mail: fuller@adeq.state.ar.us

4. DATE PREPARED.

The permit was prepared on February 11, 2008.

5. PREVIOUS PERMIT ACTIVITY.

Effective Date: June 1, 2003
Expiration Date: May 31, 2008

The permit application was received on December 3, 2007 and was deemed administratively complete on December 7, 2007. Additional information was received on June 23, 2008. The current discharge permit is being reissued for a 5-year term in accordance with regulations promulgated at 40 CFR Part 122.46(a).

6. SIGNIFICANT CHANGES FROM THE PREVIOUSLY ISSUED PERMIT.

The permittee is responsible for carefully reading the permit in detail and becoming familiar with all of the changes therein:

1. Parts II, III, and IV have been revised.
2. The facility's location coordinates have been corrected to match the most recent field data.
3. The facility's mailing address has been revised.
4. The effluent limitations for pH have been corrected from 6-9 s.u. to 6.0 to 9.0 s.u. to ensure the required accuracy in reporting.
5. The Dissolved Oxygen limit has been changed to a monthly average minimum.
6. The Ammonia Nitrogen (NH₃-N) limits have been changed based upon the toxicity criteria contained in Section 2.512 of APCEC Regulation No. 2 for the month of April.
7. Interim limits have been added to the permit based on the existing design flow of 6.3 MGD and final limits for the new design flow following construction of 8.3 MGD.
8. The Total Recoverable Copper limit has been removed and replaced with a Total Hardness limit.
9. Total Phosphorus and Total Nitrate + Nitrite Nitrogen monitoring and reporting requirements have been added in order to establish a database of point source loadings of nutrients to waters of the state of Arkansas.
10. The required operator license Class IV for the facility has been stated in Part II of the permit.
11. Statements were added to Part I allowing the removal of the Total Residual Chlorine (TRC) limit following the installation and operation of the new ultraviolet disinfection system.
12. The pretreatment requirements in Part II have been updated to include an influent, effluent, and sludge metals sampling requirement since the facility has a Significant Industrial User (SIU).
13. A condition was added to Part II to state that the facility operates under a No Exposure Exclusion for the facility's stormwater discharges.
14. A condition was added to Part II to describe the transition period resulting from the construction of a new treatment train that will increase the facility's design flow from 6.3 MGD to 8.3 MGD.

7. RECEIVING STREAM SEGMENT AND DISCHARGE LOCATION.

The outfall is located at the following coordinates:

Latitude: 34° 33' 6" Longitude: 92° 35' 36"

The receiving waters named:

Unnamed tributary of Depot Creek, thence to Depot Creek, thence to the Saline River in Segment 2C of the Ouachita River Basin. The receiving stream with USGS Hydrologic Unit Code (H.U.C) of 08040203 and reach #012 is a Water of the State classified for secondary contact recreation, raw water source for public, industrial, and agricultural water supplies, propagation of desirable species of fish and other aquatic life, and other compatible uses.

a. **303(d) LIST AND ENDANGERED SPECIES CONSIDERATIONS.**

i. **303(d) List:**

The receiving stream is not listed on the 303(d) list. Therefore, no permit action is needed.

ii. **Endangered Species:**

The Department of Arkansas Heritage has identified the following species of conservation concern within 5 miles downstream of the outfall in a letter dated March 13, 2008:

Cyprogenia aberti, western fanshell - state concern
Lampsilis satura, sandbank pocketbook - state concern
Lasmigona costata, flutedshell - state concern
Ligumia recta, black sandshell - state concern
Lampsilis powellii, Arkansas fatmucket - federal concern
Notropis perpallidus, peppered shiner - state concern
Pleurobema rubrum, pyramid pigtoe - state concern
Ptychobranchnus occidentalis, Ouachita kidneyshell - state concern
Quadrula metanevra, monkeyface - state concern
Villosa arkansasensis, Ouachita creekshell - state concern

The Department of Arkansas Heritage has identified the following species of conservation concern within the areas designated for sewage sludge disposal in a letter dated September 16, 2008:

Section 32, T1S/R15W

Cyprogenia aberti, western fanshell - state concern
Lampsilis ornata, southern pocketbook - state concern
Lasmigona costata, flutedshell - state concern
Ligumia recta, black sandshell - state concern
Lampsilis powellii, Arkansas fatmucket - federal concern (threatened)
Ptychobranchnus occidentalis, Ouachita kidneyshell - state concern
Toxolasma lividus, purple lilliput - state concern
Villosa lienosa, little spectaclecase - state concern

Section 9, T1S/R15W

Lampsilis ornata, southern pocketbook - state concern
Lampsilis satura, sandbank pocketbook - state concern
Lasmigona costata, flutedshell - state concern
Ligumia recta, black sandshell - state concern
Lampsilis powellii, Arkansas fatmucket - federal concern (threatened)
Pleurobema rubrum, pyramid pigtoe - state concern
Ptychobranchus occidentalis, Ouachita kidneyshell - state concern
Quadrula metanevra, monkeyface - state concern
Villosa lienosa, little spectaclecase - state concern

The permit limits and the sewage sludge disposal requirements in the permit are designed to protect all beneficial uses of the receiving waters, including propagation of desirable species of fish and other aquatic life, including the above species of concern. Therefore, ADEQ has determined that the final permit limits and conditions will serve to help protect the species of concern identified above.

8. OUTFALL AND TREATMENT PROCESS DESCRIPTION.

The following is a description of the **existing** treatment facility described in the application:

- a. Design Flow: 6.3 MGD
- b. Type of Treatment: Fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and chlorination.
- c. Discharge Description: treated municipal wastewater

Transition Period:

The City of Benton is constructing a new treatment train at the existing wastewater plant which will increase the design flow from 6.3 MGD to 8.3 MGD. The construction will add a new activated sludge oxidation ditch, clarifier, post aeration basin, ultraviolet disinfection chamber, aerobic digester, and a return/waste activated sludge pump station with a design flow of 8.3 MGD. The construction will also include improvements to the fine screen. The existing treatment system is: Fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and chlorination with a design flow of 6.3 MGD.

The permittee must notify the ADEQ when the new treatment train is complete and at least 30 days after the discharge at the new design flow has begun.

The following is a description of the **modified** treatment facility including the new treatment train described in the application:

Unnamed tributary of Depot Creek, thence to Depot Creek, thence to the Saline River in Segment 2C of the Ouachita River Basin. The receiving stream with USGS Hydrologic Unit Code (H.U.C) of 08040203 and reach #012 is a Water of the State classified for secondary contact recreation, raw water source for public, industrial, and agricultural water supplies, propagation of desirable species of fish and other aquatic life, and other compatible uses.

a. **303(d) LIST AND ENDANGERED SPECIES CONSIDERATIONS.**

i. **303(d) List:**

The receiving stream is not listed on the 303(d) list. Therefore, no permit action is needed.

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Pleurobema rubrum, pyramid pigtoe - state concern
Ptychobranhus occidentalis, Ouachita kidneyshell - state concern
Quadrula metanevra, monkeyface - state concern
Villosa arkansasensis, Ouachita creekshell - state concern

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Toxolasma lividus, purple lilliput - state concern
Villosa lienosa, little spectaclecase - state concern

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Ptychobranhus occidentalis, Ouachita kidneyshell - state concern
Quadrula metanevra, monkeyface - state concern
Villosa lienosa, little spectaclecase - state concern

The permit limits and the sewage sludge disposal requirements in the permit are designed to protect all beneficial uses of the receiving waters, including propagation of desirable species of fish and other aquatic life, including the above species of concern. Therefore, ADEQ has determined that the final permit limits and conditions will serve to help protect the species of concern identified above.

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- a. Design Flow: 6.3 MGD
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- c. Discharge Description: treated municipal wastewater

Transition Period:

The City of Benton is constructing a new treatment train at the existing wastewater plant which will increase the design flow from 6.3 MGD to 8.3 MGD. The construction will add a new activated sludge oxidation ditch, clarifier, post aeration basin, ultraviolet disinfection chamber, aerobic digester, and a return/waste activated sludge pump station with a design flow of 8.3 MGD. The construction will also include improvements to the fine screen. The existing treatment system is: Fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and chlorination with a design flow of 6.3 MGD.

The permittee must notify the ADEQ when the new treatment train is complete and at least 30 days after the discharge at the new design flow has begun.

The following is a description of the **modified** treatment facility including the new treatment train described in the application:

- a. Design Flow: 8.3 MGD
- b. Type of Treatment: Fine screen, grit removal, activated sludge aeration (oxidation ditch), clarification, post aeration, and ultraviolet disinfection.
- c. Discharge Description: treated municipal wastewater

9. ACTIVITY.

Under the Standard Industrial Classification (SIC) code of 4952 or North American Industry Classification System (NAICS) code of 221320, the applicant's activities are the operation of a sewage treatment plant.

10. INDUSTRIAL WASTEWATER CONTRIBUTIONS.

INDUSTRIAL USERS

This facility receives process wastewater from significant industrial users. The Department has made the decision based on several criteria that the POTW will not be required to develop an approved pretreatment program at this time. Standard boilerplate Pretreatment Prohibitions (40 CFR 403.5[b]) and additional monitoring/reporting requirements to determine the potential need for local limits per 40 CFR 403.5(c)(2) are deemed appropriate at this time.

11. SEWAGE SLUDGE PRACTICES.

Sludge is land applied to the following sites:

Field No.	Section	Township	Range	Total Acres
1	32	1S	15W	62
2	32	1S	15W	80
3	32	1S	15W	80
4	9	2S	15W	48
5	9	2S	15W	80

12. PERMIT CONDITIONS.

The Arkansas Department of Environmental Quality has made a determination to issue a permit for the discharge described in the application. Permit requirements are based on federal regulations (40 CFR Parts 122, 124, and Subchapter N), the National Pretreatment Regulation in 40 CFR Part 403 and regulations promulgated pursuant to the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended, Ark. Code Ann. 8-4-101 et. seq.).

a. **Final Effluent Limitations**

Outfall 001 with a design flow of 6.3 MGD.

i. **Conventional and/or Toxic Pollutants**

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)	Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
		Monthly Avg.	Monthly Avg.		
Flow	N/A	N/A	N/A	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5) (May-Oct)	525	10	15	three/week	24-hr comp.
(Nov-Apr)	788	15	22.5	three/week	24-hr comp.
Total Suspended Solids (TSS)	788	15	22.5	three/week	24-hr comp.
Ammonia Nitrogen (NH3-N) (April)	110	2.1	3.2	three/week	24-hr comp.
(May-Oct)	79	1.5	2.3	three/week	24-hr comp.
(Nov-Mar)	210	4	6	three/week	24-hr comp.
Dissolved Oxygen (May-Oct)	N/A	7.0, (Monthly Avg. Min.)		three/week	Grab
(Nov-Apr)	N/A	7.5, (Monthly Avg. Min.)		three/week	Grab
Fecal Coliform Bacteria (FCB) (April - September)	N/A	(colonies/100ml) 200 400		three/week	Grab
(October - March)	N/A	1000	2000	three/week	Grab
Total Residual Chlorine (TRC)	N/A	<0.1 mg/l (Inst. Max.)		three/week	Grab
Total Hardness	N/A	41, (Inst. Min.)		once/month	Grab
Total Phosphorus (TP)	N/A	Report	Report	three/week	Grab
Total Nitrate + Nitrite Nitrogen (as N)	N/A	Report	Report	three/week	Grab
pH	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	three/week	Grab
Chronic Biomonitoring	N/A	See Page 16, #15 below		once/quarter	24-hr comp.

ii. **Solids and Foam:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks.

b. **Final Effluent Limitations**

Outfall 001 with a design flow of 8.3 MGD.

i. **Conventional and/or Toxic Pollutants**

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)	Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
		Monthly Avg.	Monthly Avg.		
Flow	N/A	N/A	N/A	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5) (May-Oct)	692	10	15	three/week	24-hr comp.
(Nov-Apr)	1038	15	22.5	three/week	24-hr comp.
Total Suspended Solids (TSS)	1038	15	22.5	three/week	24-hr comp.
Ammonia Nitrogen (NH3-N) (April)	145	2.1	5.2	three/week	24-hr comp.
(May-Oct)	104	1.5	2.3	three/week	24-hr comp.
(Nov-Mar)	277	4	6	three/week	24-hr comp.
Dissolved Oxygen (May-Oct)	N/A	7.0 (Monthly Avg. Min.)		three/week	Grab
(Nov-Apr)	N/A	7.5 (Monthly Avg. Min.)		three/week	Grab
Fecal Coliform Bacteria (FCB) (April - September)	N/A	(colonies/100ml) 200 400		three/week	Grab
(October - March)	N/A	1000 2000		three/week	Grab
Total Hardness	N/A	41, (Inst. Min.)		once/month	Grab
Total Phosphorus (TP)	N/A	Report	Report	three/week	Grab
Total Nitrate + Nitrite Nitrogen (as N)	N/A	Report	Report	three/week	Grab
pH	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	three/week	Grab
Chronic Biomonitoring	N/A	See Page 16, #15 below		once/quarter	24-hr comp.

- ii. **Solids and Foam:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks.

13. BASIS FOR PERMIT CONDITIONS.

The following is an explanation of the derivation of the conditions of the permit and the reasons for them or, in the case of notices of intent to deny or terminate, reasons suggesting the decisions as required under 40 CFR Part 124.7 (48 FR 1413, April 1, 1983).

Technology-Based Versus Water Quality-Based Effluent Limitations And Conditions

Following regulations promulgated at 40 CFR Part 122.44(1)(2)(ii), the permit limits are based on either technology-based effluent limits pursuant to 40 CFR Part 122.44(a) or on State water quality standards and requirements pursuant to 40 CFR Part 122.44(d), whichever are more stringent as follows:

Parameter	Water Quality-Based		Technology-Based/BPJ		Previous Permit		Final Permit Limit	
	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l
CBOD5								
(May-Oct)	10	15	25	40	10	15	10	15
(Nov-Apr)	15	22.5	25	40	15	22.5	15	22.5
TSS	15	22.5	30	45	15	22.5	15	22.5
NH3-N								
(April)	2.1	5.2	N/A	N/A	4	6	2.1	5.2
(May-Oct)	1.5	2.3	N/A	N/A	1.5	2.3	1.5	2.3
(Nov-March)	4	6	N/A	N/A	4	6	4	6
Dissolved Oxygen								
(May-Oct)	7.0 (Monthly Avg. Min.)		N/A		7.0 (Inst. Min.)		7.0 (Monthly Avg. Min.)	
(Nov-Apr)	7.5 (Monthly Avg. Min.)		N/A		7.5 (Inst. Min.)		7.5 (Monthly Avg. Min.)	
FCB (col/100 ml)								
(Apr-Sept)	200	400	N/A	N/A	200	400	200	400
(Oct-Mar)	1000	2000	N/A	N/A	1000	2000	1000	2000
TRC (Inst. Max) ¹	N/A		<0.1 mg/l		<0.1 mg/l		<0.1 mg/l	
Total Recoverable Copper ²	12.20 µg/l	24.48 µg/l	N/A	N/A	12.20 µg/l	24.48 µg/l	Replaced with a Total Hardness limit.	

Parameter	Water Quality-Based		Technology-Based/BJP		Previous Permit		Final Permit Limit	
	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l	Monthly Avg. mg/l	7-day Avg. mg/l
Total Hardness ²	41 (Inst. Min.)		N/A		N/A		41 (Inst. Min.)	
Total Phosphorus (TP)	N/A	N/A	Report	Report	N/A	N/A	Report	Report
Total Nitrate + Nitrite Nitrogen (as N)	N/A	N/A	Report	Report	N/A	N/A	Report	Report
pH	6.0-9.0 s.u.		6.0-9.0 s.u.		6-9 s.u.		6.0-9.0 s.u.	

¹ The TRC limit will be removed after the new ultraviolet disinfection system is operational.

² The Total Recoverable Copper limit is being removed and replaced with a site specific Total Hardness limit.

Parameter	Water Quality or Technology	Justification
CBOD5	Water Quality	MultiSMP Model dated February 5, 2008
TSS	Water Quality	MultiSMP Model dated February 5, 2008
NH3-N ¹	Water Quality & Previous Permit	Section 2.512 of Regulation No. 2/ MultiSMP Model dated February 5, 2008
DO	Water Quality	Section 2.505 of Regulation No. 2
Fecal Coliform Bacteria	Water Quality	Section 2.507 of Regulation No. 2
TRC ²	Technology & Previous Permit	Section 2.508 of Regulation No. 2
Total Hardness ³	Water Quality	Section 2.508 of Regulation No. 2
TP ⁴	Water Quality	Appendix D of the Continuous Planning Process (CPP)
Nitrate + Nitrite ⁴	Water Quality	Appendix D of the CPP
pH	Water Quality	Section 2.504 of Regulation No. 2

¹ The NH3-N limits for the months of November – March are based on the previous permit in lieu of the most recent limits from the MultiSMP Model. Based on the previous sampling history, the Department feels that the permittee can meet the more stringent limits.

² The TRC limit will be removed after the new ultraviolet disinfection system is operational.

³ The Total Recoverable Copper limit from the previous permit is being replaced with a site specific Total Hardness limit.

⁴ In order to establish a database of point source loadings of nutrients to waters of the state of Arkansas, a requirement for monitoring and reporting of these parameters have been included.

a. **Anti-backsliding**

The permit is consistent with the requirements to meet Anti-backsliding provisions of the Clean Water Act (CWA), Section 402(o) [40 CFR 122.44(l)]. The final effluent limitations for re-issuance permits must be as stringent as those in the previous permit, unless the less stringent-limitations can be justified using exceptions listed in 40 CFR 122.44(l)(2)(i).

The permit maintains the requirements of the previous permit with the exception of the removal of the Total Residual Chlorine (TRC) limit upon installation and operation of the new ultraviolet disinfection system and the removal of the Total Recoverable Copper limit in lieu of a Total Hardness limit. The Total Recoverable Copper limit in the previous permit was based on an Ecoregion hardness value of 31 mg/l. In order to obtain a more accurate representation of the City of Benton's receiving stream, the City conducted a study to determine the in-stream hardness value. The results of the study showed that the in-stream hardness is consistently well above 41 mg/l. Using this in-stream hardness value to determine reasonable potential eliminated the need for a Total Recoverable Copper limit. As allowed in 40 CFR 122.44(d)(1)(vi)(C)(1), a Total Hardness limit of 41 mg/l has replaced the Total Recoverable Copper limit from the previous permit. Compliance with the Total Hardness limit will be reviewed on a monthly basis. If compliance is not consistently demonstrated, the permit may be re-opened to include a Total Recoverable Copper limit.

These revisions are allowed in accordance with the federal regulations at 40 CFR 122.44(l)(2)(i)(A) and 122.44(l)(2)(i)(B)(1), respectively.

b. **Limits Calculations**

i. Mass limits:

The calculation of the loadings (lbs per day) uses a design flow of 6.3 MGD for the Interim Limits and 8.3 MGD for the Final Limits and the following equation: lbs/day = Concentration (mg/l) X Flow (MGD) X 8.34

ii. Daily Maximum Limits:

Daily Maximum limits = Monthly average limits X 1.5

iii. Ammonia-Nitrogen (NH₃-N):

The water quality effluent limitations for Ammonia are based either on DO-based effluent limits or on toxicity-based standards, whichever are more stringent. The toxicity-based effluent limitations are based on Chapter 5, Section 2.512 of APCEC Regulation No. 2 and an ADEQ internal memo dated March 28, 2005. The following formula has been used to calculate toxicity based Ammonia limits:

$$Cd = (IWC(Qd + Qb) - CbQb)/Qd,$$

Where:

Cd = effluent limit concentration

IWC = Ammonia toxicity standard for Ecoregion

Qd = design flow

Qb = Critical flow of the receiving stream is 67 percent of the 7-day, 10-year low-flow (7Q10) for the receiving stream.

Cb = background concentration

c. **208 Plan (Water Quality Management Plan)**

The 208 Plan, developed by the ADEQ under provisions of Section 208 of the federal Clean Water Act, is a comprehensive program to work toward achieving federal water goals in Arkansas. The initial 208 Plan, adopted in 1979, provides for annual updates, but can be revised more often if necessary. The 208 Plan has been revised to increase the design flow to 8.3 MGD and to lower the water quality limit for NH₃-N in April to 2.1 mg/l. The existing water quality limitations are:

May-October: CBOD₅/TSS/NH₃-N/DO = 10/15/1.5/7.0 mg/l

November-March: CBOD₅/TSS/NH₃-N/DO = 15/15/4/7.5 mg/l

April: CBOD₅/TSS/NH₃-N/DO = 15/15/2.1/7.5 mg/l

Design flow (Q): 8.3 MGD

Background Flow of the receiving stream (7Q10): 0 cfs

d. **Toxics Pollutants**

i. Post Third Round Policy and Strategy

Section 101 of the Clean Water Act (CWA) states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited...". To insure that the CWA's prohibitions on toxic discharges are met, EPA has issued a "Policy for the Development of Water Quality-Based Permit Limitations by Toxic Pollutants"(49 FR 9016-9019,3/9/84). In support of the national policy, Region 6 adopted the "Policy for post Third Round Permitting" and the "Post Third Round Permit Implementation Strategy" on October 1, 1992. The Regional policy and strategy are designed to insure that no source will be allowed to discharge any wastewater which (1) results in instream aquatic toxicity; (2) causes a violation of an applicable narrative or numerical State water quality standard resulting in non-conformance with the provisions of 40 CFR Part 122.44(d); (3) results in the endangerment of a drinking water supply; or (4) results in aquatic bioaccumulation which threatens human health.

ii. Implementation

The State of Arkansas is currently implementing EPA's Post Third-Round Policy in conformance with the EPA Regional strategy. The 5-year discharge permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, or where there are no applicable technology-based limits, additional water quality-based effluent limitations and/or conditions are included in the discharge permits. State narrative and numerical water quality standards from Regulation No. 2 are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

iii. Priority Pollutant Scan (PPS)

In accordance with the regional policy ADEQ has reviewed and evaluated the effluent in evaluating the potential toxicity of each analyzed pollutant:

- (a) The results were evaluated and compared to EPA's Minimum Quantification Levels (MQLs) to determine the potential presence of a respective toxic pollutant. Those pollutants which are greater than or equal to the MQLs are determined to be reasonably present in the effluent and an evaluation of their potential toxicity is necessary.
- (b) Those pollutants with one datum shown as "non-detect" (ND), providing the level of detection is equal to or lower than MQL are determined to be not potentially present in the effluent and eliminated from further evaluation.
- (c) Those pollutants with a detectable value even if below the MQL are determined to be reasonably present in the effluent and an evaluation of their potential toxicity is necessary.
- (d) For those pollutants with multiple data values and all values are determined to be non-detect, therefore no further evaluation is necessary. However, where data set includes some detectable concentrations and some values as ND, one-half of the detection level is used for those values below the level of detection to calculate the geometric mean of the data set.

The concentration of each pollutant after mixing with the receiving stream was compared to the applicable water quality standards as established in the Arkansas Water Quality Standards, Reg. No. 2 and with the aquatic

toxicity, human health, and drinking water criteria obtained from the "Quality Criteria for Water, 1986 (Gold Book)". The following expression was used to calculate the pollutant instream waste concentration (IWC):

$$IWC = ((C_e \times Q_e) + (C_b \times Q_b)) / (Q_e + Q_b)$$

where:

IWC = instream concentration of pollutant after mixing with receiving stream ($\mu\text{g/l}$)

C_e = pollutant concentration in effluent ($\mu\text{g/l}$)

Q_e = effluent flow of facility (cfs)

C_b = background concentration of pollutant in receiving stream ($\mu\text{g/l}$)

Q_b = background flow of receiving stream (cfs)

The following values were used in the IWC calculations:

C_e = varies with pollutant. A single value from the Priority Pollutant Screen (PPS) submitted by the permittee as part of the discharge permit application or the geometric mean of a group of data points (less than 20 data points) is multiplied by a factor of 2.13. This factor is based on EPA's Region VI procedure (See attachment IV of Continuing Planning Process (CPP)) to extrapolate limited data sets to better evaluate the potential toxicity for higher effluent concentrations to exceed water quality standards. This procedure employs a statistical approach which yields an estimate of a selected upper percentile value (the 95th percentile) of an effluent data set which would be expected to exceed 95% of effluent concentrations in a discharge. If 20 or more data points during the last two years are available, do not multiply by 2.13, but instead use the maximum reported values.

Q_e = 8.3 MGD = 12.82 cfs

C_b = 0 $\mu\text{g/l}$

Q_b = (See below):

I. Aquatic Toxicity

Chronic Toxicity: Flow = 0 cfs, for comparison with chronic aquatic toxicity. This flow is 67 percent of the 7-day, 10-year low-flow (7Q10) for the receiving stream. The 7Q10 of 0 cfs is based on "Identification and Classification of Perennial Stream of Arkansas", Arkansas Geological Commission Map.

Acute Toxicity: Flow = 0 cfs, for comparison with acute aquatic toxicity. This flow is 33 percent of the 7Q10 for the receiving stream.

II. Bioaccumulation

Flow = 0 cfs, for comparison with bioaccumulation criteria. This flow is the long term average (LTA) of the receiving stream which is based on the "Identification and Classification of Perennial Stream of Arkansas", Arkansas Geological Commission Map.

III. Drinking Water

Flow = 0 cfs, for comparison with drinking water criteria. This flow is the 7Q10 for the receiving stream.

The following values were used to determine limits for the pollutants:

Hardness = 41 mg/l, based on site specific hardness data and a Total Hardness limit.

TSS = 5.5 mg/l, based on attachment V of CPP

pH = 7.09 s.u., based on compliance data from "Arkansas Water Quality Inventory Report" 305(b).

iv. Water Quality Standards for Metals and Cyanide

Standards for Chromium (VI), Mercury, Selenium, 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 water-effect ratio, and as a function of hardness.

The Water-effect ratio (WER) is assigned a value of 1.0 unless scientifically defensible study clearly demonstrates that a value less than 1.0 is necessary or a value greater than 1.0 is sufficient to fully protect the designated uses of the receiving stream from the toxic effects of the pollutant.

The WER approach compares bioavailability and toxicity of a specific pollutant in receiving water and in laboratory test water. It involves running toxicity tests for at least two species, measuring LC50 for the pollutant using the local receiving water collected from the site where the criterion is being implemented, and laboratory toxicity testing water made comparable to the site water in terms of chemical hardness. The ratio between site water and lab water LC50 is used to adjust the national acute and chronic criteria to site specific values.

v. Conversion of Dissolved Metals Criteria for Aquatic Life to Total Recoverable Metal

Metals criteria established in APCEC Regulation No. 2, Section 2.508 for aquatic life protection are based on dissolved metals concentrations and hardness values. However, Federal Regulations cited at 40 CFR Part 122.45(c) require that effluent limitations for metals in discharge permits be expressed as total recoverable based on Attachment V of CPP. Therefore a dissolved to the total recoverable metal conversion must be implemented. This involves determining a linear partition coefficient for the metal of concern and using this coefficient to determine the fraction of metal dissolved, so that the dissolved metal ambient criteria may be translated to a total effluent limit. The formula for converting dissolved metals to total recoverable metals for streams and lakes are provided in Attachment V of CPP and Region 6 Implementation Guidance for Arkansas Water Quality Standards promulgated at 40 CFR Part 131.36.

vi. Comparison of the submitted information with the water quality standards and criteria

The following pollutants were determined to be present in the effluent for each pollutant as reported by the permittee.

Pollutant	Concentration Reported, $\mu\text{g/l}$	MQL, $\mu\text{g/l}$
Zinc	37.3 ¹	20
Copper, Total Recoverable	13.7 ²	10

¹ One data concentration value from Priority Pollutant Scan (PPS).

² Highest concentration value from previous 2 years of sampling data.

However, ADEQ has determined from the information submitted by the permittee that no water quality standards or Gold Book criteria are exceeded. Therefore, no permit action is necessary to maintain these standards or criteria.

14. **TOTAL RESIDUAL CHLORINE (TRC) REQUIREMENTS.** The TRC limit will be removed after the new ultraviolet disinfection system is operational.

After dechlorination and prior to final disposal, the effluent shall contain NO MEASURABLE TRC at any time. NO MEASURABLE will be defined as no detectable concentration of TRC as determined by any approved method established in 40 CFR Part 136 as less than 0.1 mg/l. Thus, the “no measurable TRC concentration” for chlorine becomes the permit limit. The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes. TRC shall be measured with fifteen (15) minutes of sampling.

15. BIOMONITORING.

Section 101(a)(3) of the Clean Water Act states that ".....it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In addition, ADEQ is required under 40 CFR Part 122.44(d)(1), adopted by reference in Regulation 6, to include conditions as necessary to achieve water quality standards as established under Section 303 of the Clean Water Act. Arkansas has established a narrative criteria which states "toxic materials shall not be present in receiving waters 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 aquatic biota."

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates the effects of synergism of effluent components and receiving stream water quality characteristics. It is the national policy of EPA to use bioassays as a measure of toxicity to allow evaluation of the effects of a discharge upon a receiving water (49 Federal Register 9016-9019, March 9, 1984). EPA Region 6 and the State of Arkansas are now implementing the Post Third Round Policy and Strategy established on September 9, 1992, and EPA Region 6 Post-Third Round Whole Effluent Toxicity Testing Frequencies, revised March 13, 2000. Biomonitoring of the effluent is thereby required as a condition of this permit to assess potential toxicity. The biomonitoring procedures stipulated as a condition of this permit are as follows:

TOXICITY TESTS	FREQUENCY
Chronic Biomonitoring	Once/quarter

Requirements for measurement frequency are based on appendix D of CPP.

Since 7Q10 is less than 100 cfs (ft³/sec) and dilution ratio is less than 100:1, chronic biomonitoring requirements will be included in the permit.

The calculations for dilution used for chronic biomonitoring are as follows:

$$\text{Critical dilution (CD)} = (Q_d / (Q_d + Q_b)) \times 100$$

$$Q_d = \text{Design flow} = 8.3 \text{ MGD} = 12.82 \text{ cfs}$$

$$7Q10 = 0 \text{ Cfs}$$

$$Q_b = \text{Background flow} = (0.67) \times 7Q10 = 0 \text{ cfs}$$

$$\text{Since } 7Q10 = 0 \text{ cfs then } CD = 100\%$$

Toxicity tests shall be performed in accordance with protocols described in "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", EPA/600/4-91/002, July 1994. A minimum of five effluent dilutions in addition to an appropriate control (0%) are to be used in the toxicity tests.

These additional effluent concentrations are **32%, 42%, 56%, 75%, and 100%** (See **Attachment I** of CPP). The low-flow effluent concentration (critical dilution) is defined as 100% effluent. The requirement for chronic biomonitoring tests is based on the magnitude of the facility's discharge with respect to receiving stream flow. The stipulated test species, *Ceriodaphnia dubia* and the Fathead Minnow (*Pimephales promelas*) are indigenous to the geographic area of the facility; the use of these is consistent with the requirements of the State water quality standards. The biomonitoring frequency has been established to provide data representative of the toxic potential of the facility's discharge, in accordance with the regulations promulgated at 40 CFR Part 122.48.

Results of all dilutions as well as the associated chemical monitoring of pH, temperature, hardness, dissolved oxygen conductivity, and alkalinity shall be reported according to EPA/600/4-91/002, July 1994 and shall be submitted as an attachment to the Discharge Monitoring Report (DMR).

This permit may be re-opened to require further biomonitoring studies, Toxicity Reduction Evaluation (TRE) and/or effluent limits if biomonitoring data submitted to the Department shows toxicity in the permittee's discharge. Modification or revocation of this permit is subject to the provisions of 40 CFR 122.62, as adopted by reference in ADEQ Regulation No. 6. Increased or intensified toxicity testing may also be required in accordance with Section 308 of the Clean Water Act and Section 8-4-201 of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

Administrative Records

The following information summarized toxicity test submitted by the permittee during the term of the current permit at outfall **001**:

BIOMONITORING FREQUENCY RECOMMENDATION AND RATIONALE FOR ADDITIONAL REQUIREMENTS

Permit Number: **AR0036498**

Facility Name: **City of Benton**

Previous Critical Dilution: **100%**

Proposed Critical Dilution: **100%**

Date of Review: **01/02/08**

Name of Reviewer: **Barnett**

Number of tests performed during previous 5 years by species:

***Pimephales promelas* (Fathead minnow): 22**

***Ceriodaphnia dubia* (water flea): 22**

Failed test dates during previous 5 years by species:

***Pimephales promelas* (Fathead minnow):**

Lethal

Sublethal

None

03-03

04-03

07-03

12-06

<i>Ceriodaphnia dubia</i> (water flea):	<u>Lethal</u> None	<u>Sublethal</u> 03-05
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Previous TRE activities: None

Frequency recommendation by species:

***Pimephales promelas* (Fathead minnow): four/year**

***Ceriodaphnia dubia* (water flea): four/year**

Additional requirements (including WET Limits) rationale/comments concerning permitting:

Rationale: According to the EPA Region 6 Post-Third Round Whole Effluent Toxicity Testing Frequencies: "All major dischargers, and those minor dischargers specifically identified by EPA or the State permitting authority (based on available information on a case-by case basis) as posing a significant unaddressed toxic risk, will be required to perform Whole Effluent Toxicity testing at a frequency of once per quarter for the vertebrate and invertebrate tests species for the first year of a new or reissued permit."

16. **SAMPLE TYPE AND FREQUENCY.**

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity [40 CFR Part 122.48(b)] and to ensure compliance with permit limitations [40 CFR Part 122.44(i)(1)].

Requirements for sample type and sampling frequency have been based on the current discharge permit.

17. **STORMWATER POLLUTION PREVENTION PLAN REQUIREMENTS.**

In lieu of stormwater pollution prevention plan requirements, a No Exposure Certification (Tracking #ARR00C399) was issued. Under the no exposure certification, any discharge of stormwater not in compliance with the No Exposure Certification requirements is a violation of the permit.

18. **PERMIT COMPLIANCE.**

The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

1. Compliance is required on the effective date of the permit.
2. The permittee must sample the wastewater treatment plant's influent and effluent in accordance with the provisions in Part II.7.C once/two (2) months for one year following the effective date of the permit.

3. The permittee must submit annual reports of biosolids analysis in accordance with Part II.8.B.1.b(1) prior to May 1st of each year.

19. MONITORING AND REPORTING.

The applicant is at all times required to monitor the discharge on a regular basis and report the results monthly. The monitoring results will be available to the public.

20. SOURCES.

The following sources were used to finalize the permit:

- a. Application No. AR0036498 received 12/3/2007.
- b. Arkansas Water Quality Management Plan (WQMP).
- c. APCEC Regulation No. 2.
- d. APCEC Regulation No. 3.
- e. APCEC Regulation No. 6.
- f. 40 CFR Parts 122, 125, 133 and 403.
- g. Discharge permit file AR0036498.
- h. Discharge Monitoring Reports (DMRs).
- i. "Arkansas Water Quality Inventory Report 2004 (305B)", ADEQ.
- j. Memo from Mo Shafii to Engineers dated March 28, 2005
- k. "Identification and Classification of Perennial Streams of Arkansas", Arkansas Geological Commission.
- l. Continuing Planning Process (CPP).
- m. Technical Support Document For Water Quality-based Toxic Control.
- n. Region 6 Implementation Guidance for Arkansas Water Quality Standards promulgated at 40 CFR Part 131.36.
- o. Inspection Report dated October 27, 2006.

21. POINT OF CONTACT.

For additional information, contact:

Kimberly A. Fuller, PE, CPESC
Permits Branch, Water Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317
Telephone: (501) 682-0643
Email: fuller@adeq.state.ar.us