Henderson, Katie

From: Reiber, Loretta
Sent: Tuesday, June 01, 2010 8:47 AM
To: Henderson, Katie
Subject: FW: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 1 of 4)

-----Original Message-----
From: Tillman.Michael@epamail.epa.gov [mailto:Tillman.Michael@epamail.epa.gov]
Sent: Tuesday, August 04, 2009 9:38 AM
To: bruce.fielding@la.gov
Cc: Reiber, Loretta; Bailey, John; Baskin.Kilty@epamail.epa.gov
Subject: Fw: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 1 of 4)

Good morning Bruce,

It was a pleasure speaking with you this morning, it has been a long while. As I mentioned, one of the pemit writers with the state of Arkansas (Loretta Reiber) is wanting someone in your shop to look over the water quality screens they have performed for GP Crossett / Ouachita River Basin. At your earliest convenience, If you would please take a look at the attached information, for compliance with LA water quality standards that would be great.

I will be passing this along in 4 parts. Any questions, please contact Loretta directly at the phone number / email below. Thanks in advance for you time and assistance.

Mike Tillman (6WQ-PO)
Arkansas / Texas - State NPDES Coord.
U.S. EPA Region 6
1445 Ross Ave.
Dallas, TX 75202
phn. 214-665-7531, fax. 214-665-2191

----- Forwarded by Michael Tillman/R6/USEPA/US on 08/04/2009 09:33 AM -----

FW: GP Crossett, NPDES Permit No. AR0001210

Reiber, Loretta to: Michael Tillman 07/29/2009 02:39 PM

Wouldn't let me send all at once so doing it in batches.

-----Original Message-----
From: Reiber, Loretta
Sent: Wednesday, July 29, 2009 2:38 PM
To: 'Tillman.Michael@epamail.epa.gov'
Subject: GP Crossett, NPDES Permit No. AR0001210

Mike,

Attached are the Priority Pollutant Scan calculations and ADEQ's review. ADEQ is requesting a review of these documents in order to confirm compliance with LDEQ's procedures at SMS2.

If you have any questions, please feel free to contact me at (501) 682-0612 or by e-mail at reiber@adeq.state.ar.us.

Loretta Reiber, P.E.
Engineer, NPDES Permits

Georgia-Pacific LLC
Crossett Paper Operations

A. **Toxics Pollutants**

(1) 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 NPDES Permitting" and the "Post Third Round NPDES 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.

(2) 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.

(3) Priority Pollutant Scan

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 manner in which the Instream Waste Concentrations are calculated may be found on page 2 of each of the attachments.

I. Aquatic Toxicity, Bioaccumulation, and Drinking Water

Arkansas Requirements

The flows (for acute, chronic, and bioaccumulation), TSS, hardness, etc. are based upon ADEQ's CPP.

Outfall 001		
Flow	52.4 MGD = 80.96 cfs	Application
7Q10	0 cfs	U.S.G.S.
TSS	5.5 mg/l	CPP, Section 5.24.3
Hardness as $CaCO_3$	31 mg/l	CPP, Section 5.24.1
pH	7.01 s.u.	OUA008B
Stream Monitoring Station (SMS2)		
Flow	52.4 MGD = 80.96 cfs	Application
7Q10	1200 cfs	EPA*
TSS	5.5 mg/l	CPP, Section 5.24.3
Hardness as $CaCO_3$	28 mg/l	CPP, Section 5.24.1
pH	7.01 s.u.	OUA008B

*Letter dated July 3, 2001.

Louisiana Requirements

The requirements of Louisiana are not applicable at Outfall 001 because of the distance from the outfall to the state line (over 10 stream miles). Also, effluent which is discharged through Outfall 001 is monitored at SMS2 when Mossy Lake is not flooeded. SMS2 is a monitoring point located approximately 2.5 miles upstream of the Arkansas/Louisiana state line.

The flows (for acute, chronic, and bioaccumulation) are based upon the requirements of Title 33, Part IX, Subpart I, Section 1115, Table 2a.

Stream Monitoring Station (SMS2)		
Flow	52.4 MGD = 80.96 cfs	Application
7Q10	1200 cfs	EPA*
TSS	6 mg/l	E-mail**
Hardness as $CaCO_3$	38.4 mg/l	E-mail**
pH	7.01 s.u.	OUA008B

*Letter dated July 3, 2001.

** These values were received via e-mail from Jeremy "Todd" Franklin of LDEQ on 06/16/2009.

(4) 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.

(5) Conversion of Dissolved Metals Criteria for Aquatic Life to Total Recoverable Metal

Metals criteria established in Regulation No. 2 for aquatic life protection are based on dissolved metals concentrations and hardness values (See Page 6 of Attachment 1). However, Federal Regulations cited at 40 CFR 122.45(c) require that effluent limitations for metals in discharge permits be expressed as total recoverable (See

Attachments 1, 2, and 3). 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 Section 5.25 of the CPP and Region 6 Implementation Guidance for Arkansas Water Quality Standards promulgated at 40 CFR Part 131.36.

(6) Comparison of the submitted information with the water quality standards and criteria

(a) Outfall 001

The following pollutants were determined to be present in the effluent from **Outfall 001** as reported by the permittee.

Pollutant	Concentration Reported, µg/l	MQL Required by ADEQ's CPP
Total Recoverable Chromium	4.3	10*
Hexavalent Chromium, Dissolved	4.3	10*
Total Recoverable Copper	6.79	0.5
Total Recoverable Lead	2.37	0.5
Total Recoverable Mercury	0.00833	0.005
Total Recoverable Nickel	7.07	0.5
Total Recoverable Selenium	2.22	5*
Total Recoverable Silver	3.58	0.5
Total Recoverable Thallium	2.96	0.5
Total Recoverable Zinc	373	20
Total Recoverable Phenols	0.0445	5*
Alpha-BHC	0.0501	0.05
Gamma-BHC	0.0642	0.05
Delta-BHC	0.0688	0.05
Endosulfan sulfate	0.0662	0.1
Endrin aldehyde	0.269	0.1

*Actual detection level achieved was lower than what was required.

As indicated in the above table, ADEQ has determined from the information submitted by the permittee that the water quality standards for Total Recoverable Copper, Total Recoverable Lead, Total Recoverable Mercury, Total Recoverable Zinc, Alpha-BHC, Gamma-BHC, Delta-BHC, Endosulfan sulfate, and Endrin aldehyde and the Gold Book criteria for Total Recoverable Thallium are exceeded. Permit action will be taken for the parameters for which the permittee demonstrated reasonable potential for exceedances of the water quality standards and/or Gold Book Criteria (See Attachment 1).

(b) SMS2

The following pollutants were determined to be present at **SMS2** as reported by the permittee.

Arkansas Standards

Pollutant	Concentration Reported, µg/l	MQL Required by ADEQ's CPP
Total Recoverable Cadmium	1.17	1
Total Recoverable Chromium	5.66	10*
Hexavalent Chromium, Dissolved	5.66	10*
Total Recoverable Copper	11.7	0.5
Total Recoverable Lead	3.13	0.5
Total Recoverable Mercury	0.009	0.005
Total Recoverable Nickel	7.87	0.5
Total Recoverable Selenium	11.3	5
Total Recoverable Zinc	251	20
Bis(2-ethylhexyl) phthalate	<10	10*
Gamma-BHC	0.0969	0.05
Delta-BHC	<0.05	0.05*
Dieldrin	0.113	0.02
Alpha-endosulfan	0.0211	0.01

*Actual detection level achieved was lower than what was required.

Louisiana Standards

Pollutant	Concentration Reported, µg/l	MQL Required by LDEQ**
Total Recoverable Cadmium	1.17	1
Total Recoverable Chromium	5.66	10*
Hexavalent Chromium, Dissolved	5.66	10*
Total Recoverable Copper	11.7	10
Total Recoverable Lead	3.13	5
Total Recoverable Mercury	0.009	0.2
Total Recoverable Nickel	7.87	40
Total Recoverable Zinc	251	20
Gamma-BHC	0.0969	0.05
Dieldrin	0.113	0.1
Alpha-endosulfan	0.0211	0.1

*Actual detection level achieved was lower than what was required.
**Based on *Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan, Volume 3.* Dated April 16, 2008 (Version 6). Obtained from LDEQ's web site on June 12, 2009.
***WQS not listed in L.A.C. 33:IX:1113.

As indicated in the above tables, ADEQ has determined from the information submitted by the permittee that some water quality standards are exceeded while others are not. The effluent demonstrated reasonable potential for exceedances of Arkansas' water quality standards for Total Recoverable Selenium, Total Recoverable Zinc, and Dieldrin. The effluent also demonstrated reasonable potential for exceedances of Louisiana's water quality standards for Total Recoverable Zinc and gamma-BHC. Permit action will be taken for the parameters for which the permittee demonstrated reasonable potential for exceedances of the water quality standards (See Attachments 2 and 3). No Gold Book criteria were exceeded at SMS2.

(c) Aquatic Toxicity

(i) Pollutants with numerical water quality standards

a. Outfall 001

ADEQ has determined from the information submitted by the permittee that there is a reasonable potential for the discharge to cause an instream excursion above the acute and/or chronic numeric standards as specified in the Arkansas Water Quality Standards, Reg. No. 2 (See Attachment 1).

ADEQ has identified the following toxicants in the discharge in amounts which could potentially have a toxic impact on the receiving stream:

OUTFALL 001

Chronic Aquatic Toxicity Results				
Pollutant	C_e, µg/l	C_e X 2.13	IWC, µg/l	AWQS, µg/l
Total Recoverable Copper	6.79	14.46	14.46	10.93
Total Recoverable Lead	2.37	5.05	5.05	3.40
Total Recoverable Mercury	0.00833	0.02	0.02	0.012
Total Recoverable Zinc	373	794.49	794.49	119.50
Alpha-BHC	0.0501	0.11	0.11	0.08
Gamma-BHC	0.0642	0.14	0.14	0.08
Delta-BHC	0.0688	0.15	0.15	0.08
Endosulfan Sulfate	0.0662	0.14	0.14	0.056
Endrin Aldehyde	0.269	0.57	0.57	0.0023

Acute Aquatic Toxicity Results				
Pollutant	C_e, µg/l	C_e X 2.13	IWC, µg/l	AWQS, µg/l
Total Recoverable Silver	3.58	7.63	7.63	1.51
Total Reoverable Zinc	373	794.49	794.49	130.87
Endrin Aldehyde	0.269	0.57	0.57	0.18

b. SMS2

ADEQ has determined from the information submitted by the permittee that there is a reasonable potential for the discharge to cause an instream excursion above the acute and/or chronic numeric standards as specified in the Arkansas Water Quality Standards, Reg. No. 2 and/or in Louisiana's Water Quality Regulations at L.A.C. 33:IX:1113 (See Attachments 2 and 3).

ADEQ has identified the following toxicants in the discharge in amounts which could potentially have a toxic impact on the receiving stream:

Chronic Aquatic Toxicity Results						
Pollutant	C_e, µg/l	C_e X 2.13	AR IWC, µg/l	AR WQS, µg/l	LA IWC, µg/l	LA WQS, µg/l
Dieldrin	0.113	0.241	0.05	0.019	**	**
Total Recoverable Selenium	11.3	24.07	5.11	5	*	*
Total Recoverable Zinc	251	534.63	113.62	109.63	**	**
Gamma-BHC	0.0969	0.206	***	***	0.35	0.21

*WQS not listed in L.A.C. 33:IX:1113.
**Reasonable potential only demonstrated based upon Louisiana's requirements.
***Reasonable potential only demonstrated based upon Arkansas' requirements.

Acute Aquatic Toxicity Results						
Pollutant	C_e, µg/l	C_e X 2.13	AR IWC, µg/l	AR WQS, µg/l	LA IWC, µg/l	LA WQS, µg/l
Total Recoverable Zinc	251	534.63	282.97	120.05	359.02	159.70

IWC's have been calculated in the manner described on page 2 of the attachments.

c. Permit Action

Under Federal Regulation 40 CFR Part 122.44(d), as adopted by Regulation No. 6, if a discharge poses the reasonable potential to cause or contribute to an exceedance above a water quality standard, the permit must contain an effluent limitation for that pollutant. Effluent limitations for the toxicants listed above have been derived in a manner consistent with the Technical Support Document (TSD) for Water Quality-based Toxics Control (EPA, March 1991), the State's implementations procedures, and 40 CFR Part 122.45(c).

Permit Limit Determination

The instream waste load allocation (WLA), which is the level of effluent concentration that would comply with the water quality standard (WQS) of the receiving stream, is calculated for both chronic and acute WLA using the following equations:

$WLA_c = (WQS \text{ X } (Q_d + Q_b) - Q_b \text{ X } C_b))/Q_d$

Where:

WLA_c = chronic waste load allocation (μg/l)

Q_d = discharge flow (cfs)
Q_b = 0.67 X 7Q10 (cfs) **@ Outfall 001**
Q_b = 0.25 X 7Q10 (cfs) **@ SMS2 for AR WQS**
Q_b = 0.33 X 7Q10 (cfs) **@ SMS2 for LA WQS**
C_b = background concentration (μg/l)
WQS = chronic aquatic toxicity standards (μg/l)

and;

$WLA_a = (WQS \text{ X } (Q_d + Q_b) - Q_b \text{ X } C_b))/Q_d$

Where:

WLA_a = acute waste load allocation (μg/l)
Q_d = discharge flow (cfs)
Q_b = 0.33 X 7Q10 (cfs) **@ Outfall 001**
Q_b = 0.06 X 7Q10 (cfs) **@ SMS2 for AR WQS**
Q_b = 0.033 X 7Q10 (cfs) **@ SMS2 for LA WQS**
C_b = background concentration (μg/l)
WQS = acute aquatic toxicity standards (μg/l)

The long term average (LTA) effluent concentration is then calculated based on the chronic and acute WLA as follows:

$LTA_c = 0.72 \text{ X } WLA_c$
$LTA_a = 0.57 \text{ X } WLA_a$

The lowest of these two (2) values is selected as being the limiting LTA. The limiting LTA is then used to calculate the monthly average (AML) and daily maximum (DML) for the final limits. AML and DML are calculated as follows:

AML = 1.55 X Limiting LTA
DML = 3.11 X Limiting LTA

Limits included in the permit are as follows:

OUTFALL 001

See Attachment 1 regarding the calculations for the following permit limits.

Arkansas Numerical Aquatic Toxicity Limits		
Parameter	AML*, µg/l	DML*, µg/l
Total Recoverable Copper	12.20	24.48

Arkansas Numerical Aquatic Toxicity Limits		
Parameter	AML*, µg/l	DML*, µg/l
Total Recoverable Lead	3.80	7.62
Total Recoverable Mercury	0.012	0.012
Total Recoverable Zinc	115.62	231.99
Alpha-BHC	0.04	0.12
Gamma-BHC	0.09	0.18
Delta-BHC	0.09	0.18
Endosulfan Sulfate	0.06	0.13
Endrin Aldehyde	0.003	0.005

SMS2

See Attachment 2 regarding the calculations for the limits on Total Recoverable Selenium, Total Recoverable Zinc, and Dieldrin. The permittee did not demonstrate reasonable potential for water quality violations due to Total Recoverable Selenium and Dieldrin in Louisiana. Therefore, those permit limits were based on ADEQ's permitting procedures.

The reach of the Ouachita River which receives the effluent from this facility (Reach #002 in H.U.C. 08040202) is on the 303(d) due to Zinc. The permittee demonstrated reasonable potential for water quality violations due to the levels of Total Recoverable Zinc. Permit limits were determined using both ADEQ's and LDEQ's permitting procedures. The more stringent limits were those calculated using ADEQ's permitting procedures. Therefore, those limits were placed in the permit.

The permittee did not demonstrate reasonable potential for water quality violations due to Total Recoverable Copper in either Arkansas or Louisiana. However, the reach of the Ouachita River which receives the effluent from this facility is on the 303(d) list due to Copper. Therefore, permit limits based on ADEQ's permitting procedures have been included in the permit.

The Department will reopen the permit to include any TMDLs which are finalized during the term of the permit.

See Attachment 3 regarding the calculations for the limits on Gamma-BHC. The permittee did not show reasonable potential for water quality

violations due to Gamma-BHC in Arkansas. Therefore, the Gamma-BHC limits were based upon LDEQ's permitting procedures.

Numerical Aquatic Toxicity Limits		
Parameter	AML*, µg/l	DML*, µg/l
Gamma-BHC	1.381	2.770
Total Recoverable Copper	22.43	45.00
Total Recoverable Selenium	26.26	52.68
Total Recoverable Zinc	200.40	402.09
Dieldrin	0.01	0.02

(ii) Pollutants without applicable water quality standards

ADEQ has determined from the information submitted by the permittee that there is not a reasonable potential for the discharge to cause an instream excursion above the acute and/or chronic criteria as specified in the Gold Book (See Attachments 1, 2, and 3).

b. Human Health (Bioaccumulation) Limits

i. Pollutants with numerical water quality standards

ADEQ has determined from the information submitted by the permittee that there is not a reasonable potential for the discharge to cause an instream excursion above the state numeric bioaccumulation standards as specified in Reg. 2.508 and LDEQ's water quality regulations.

ii. Pollutants without applicable water quality standards

ADEQ has determined from the information submitted by the permittee that there is reasonable potential for the discharge to cause excedence of bioaccumulation criterion as specified in the Gold Book (Quality Criteria for Water 1986) for only **Total Recoverable Thallium at Outfall 001**. The results of the analysis are as follows:

Bioaccumulation Criterion Results				
Pollutant	C_e, µg/l	C_e X 2.13	IWC, µg/l	GB, µg/l
Total Recoverable Thallium	2.96	6.3048	6.3048	6.3

IWC's have been calculated in the manner described on page 2 of the attachments.

Since the Arkansas Water Quality Standards have not been established for those parameters listed above, no permit limitations have been placed in the draft permit. However, monitoring and reporting is required to confirm that the pollutant is present at the levels reported by the permittee. The permit may be reopened to require effluent limitations, additional testing, and/or other appropriate actions.

iii. Drinking Water Supply Protection

ADEQ has determined from the information submitted by the permittee that there is not a reasonable potential for the discharge to cause an instream excursion above the drinking water criteria as specified in the Gold Book.

Henderson, Katie

From: Reiber, Loretta
Sent: Tuesday, June 01, 2010 8:47 AM
To: Henderson, Katie
Subject: FW: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 2 of 4)

-----Original Message-----
From: Tillman.Michael@epamail.epa.gov [mailto:Tillman.Michael@epamail.epa.gov]
Sent: Tuesday, August 04, 2009 9:40 AM
To: bruce.fielding@la.gov
Cc: Reiber, Loretta; Bailey, John; Baskin.Kilty@epamail.epa.gov
Subject: Fw: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 2 of 4)

----- Forwarded by Michael Tillman/R6/USEPA/US on 08/04/2009 09:48 AM -----

FW: GP Crossett, NPDES Permit No. AR0001210

Reiber, Loretta to: Michael Tillman 07/29/2009 02:41 PM

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From: Reiber, Loretta
Sent: Wednesday, July 29, 2009 2:38 PM
To: 'Tillman.Michael@epamail.epa.gov'
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Mike,

Attached are the Priority Pollutant Scan calculations and ADEQ's review. ADEQ is requesting a review of these documents in order to confirm compliance with LDEQ's procedures at SMS2.

If you have any questions, please feel free to contact me at (501) 682-0612 or by e-mail at reiber@adeq.state.ar.us.

Loretta Reiber, P.E.
Engineer, NPDES Permits

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1						CALCULATIONS OF LOUSIANA WATER QUALITY-BASED EFFLUENT LIMITATIONS										
2								For an Arkansas River/Stream								
3								(Reserved)								
4	STEP 1:	INPUT TWO LETTER CODE FOR ECOREGION (Use Code at Right)						GC								
5		Basin Name						Ouachita								
6											Codes & TSS for Ecoregions and Large Rivers					
7	FACILITY															
8										Ouachita Mts. Eco (OM) =		2.0 mg/l	Arkansas (Ft. Smith to Dardanelle Dam			12.0 mg/l
9	Permittee							GP Crossett		Ozark Highlands Eco (OH) =		2.5 mg/l	Arkansas (Dardanelle Dam to Terry L&			10.5 mg/l
10	NPDES Permit No.							AR0001210		Boston Mts. Eco (BM) =		1.3 mg/l	Arkansas (Terry L&D to L&D No. 5)			8.3 mg/l
11	Outfall No.(s)							SMS2		Ark River Valley Eco (AV) =		3.0 mg/l	Arkansas (L&D No. 5 to Mouth)			9.0 mg/l
12	Plant Effluent Flow (MGD)							52.40		Gulf Coastal Eco (GC) =		5.5 mg/l	White (Above Beaver Lake)			2.5 mg/l
13	Plant Effluent Flow (cfs)							80.96		Delta Ecoregion (DL) =		8.0 mg/l	White (Below Bull Shoals to Black Riv)			3.3 mg/l
14													White (From Black River to Mouth)			18.5 mg/l
15	RECEIVING STREAM												St. Francis River			18.0 mg/l
16													Ouachita (Above Caddo River)			2.0 mg/l
17	Is this a large river? (see list at right)(enter "1" if yes, "0" if no, make entry as a number)							1					Ouachita (Below Caddo River)			5.5 mg/l
18	Name of Receiving Stream							Ouachita River					Red River			33.0 mg/l
19	Waterbody Segment Code No.							2D								
20	Is this a lake or reservoir? (enter '1' if yes, ' 0 ' = no; make entry as a number)							0			Total Hardness for:					
21	Second Enter Enter 7Q10 in Cell H31							0			Arkansas River = 125 mg/l			Red River = 211 mg/l		
22	(Reserved)	DO NOT INPUT DATA INTO CELL H22, H23 & H24....LEAVE BLANK=						(Reserved)			Ouachita River = 28 mg/l			St. Francis River = 103 mg/l		
23	(Reserved)										White River = 116 mg/l					
24		(Reserved)		(Reserved)				(Reserved)								
25				(Reserved)				(Reserved)			Gulf Coastal = 31 mg/l			Ouachita Mount = 31 mg/l		
26				(Reserved)				(Reserved)			Ozark Highlands = 148 mg/l			Ark River Valley = 25 mg/l		
27				(Reserved)				(Reserved)			Boston Mount = 25 mg/l			Delta = 81 mg/l		
28																
29	Ecoregion TSS (mg/l) (For Large River, See List to Right)							6.00			Large Rivers					
30	Ecoregion Hardness (mg/l)							38.40			Mississippi River, Arkansas River, Red River					
31	Enter 7Q10 (cfs) as the Critical Flow		(Reserved)	(Reserved)				1200.00	(Reserved		White (Below confluence with Black River)					
32	Long Term Ave / Harmonic Mean Flow (cfs)							1200.00	(Reserved	(Reserved)	Ouachita (Below confluence with Little Miss. River)					
33	Using Diffusers (Yes/No)							no								
34	pH (Avg)							7.01			For industrial and federal facility, use the highest monthly average flow					
35	Percent (%) of Critical Flow for Chronic Criteria							0.33			for the past 24 months. For POTWs, use the design flow.					
36	Percent (%) of Critical Flow for Acute Criteria							0.03								
37	Water Effect Ratio (WER)							1.00			#VALUE! => No violation or Not Applicable					
38	Ave Monthly Limit LTA Multiplier (Ref. page 103 TSD for WQ-Based Toxics Control)							1.55			9999999.00 => No EPA/ADEQ Guideline					
39	Max Daily Limit LTA Multiplier (Ref. " " " ")							3.11								

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
40																
41	**STEP 2:**	INPUT AMBIENT AND EFFLUENT DATA														
42		CALCULATE IN-STREAM WASTE CONCENTRATIONS														
43																
44	DATA INPUT			For less than 20 data points enter geometric mean concentration as micro-gram per liter (ug/l or ppb).												
45				For 20 or more data points in set enter highest concentration as micro-gram per liter (ug/l or ppb).												
46																
47				Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, the 1/2 DL is used.												
48				Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, "0" is used.												
49				If a firm value is reported, even less than MQL, the reported value is used.												
50																
51				The following formulae is used to calculate the Instream Waste Concentration (IWC)												
52				(Please refer to CPP for detail)												
53				IWC = [(F*Qa*Cb) + (Qe*2.13*Ce)] / (F*Qa + Qe)												
54				Where:												
55				IWC = Instream Waste Concentration												
56				F = Fraction of stream allowed for mixing												
57				Ce = Reported concentration in effluent												
58				Cb = Ambient stream concentration upstream of discharge												
59				Qe = Plant effluent flow												
60				Qb = Critical low flow of stream at discharge point expressed as the 7Q10 or harmonic mean flow for human health criteria												
61				Upstream Flow (Qb)= (% of 7Q10) X 7Q10 for Chronic and Acute												
62																
63	The following formulae convert metals reported in total form to dissolved form if criteria are in dissolved form															
64																
65	Kp = Kpo * (TSS**a)					Kp = Linear partition coefficient; Kpo and a can be found in table below										
66	C/Ct = 1/ (1 + Kp*TSS* 10^-6)					TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)										
67	Total Metal Criteria (Ct) = Cr / (C/Ct)					C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value										
68																
69				***Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert t**							**Lake Linear Partition Coefficient**					
70	Total Metals	Dissolved Value in Stream		Kpo	alpha (a)	Kp	C/Ct	Total Value			Kpo	alpha (a)	Kp	C/Ct	Total Value	
71																
72	Arsenic			480000	-0.73	129774.936	0.562224279	0.00			480000.00	-0.73	129774.94	0.5622243	0	
73	Cadmium			4000000	-1.13	528140.021	0.239874874	0.00			3520000.00	-0.92	677085.50	0.1975304	0	
74	Chromium(3)			3360000	-0.93	634831.714	0.207943859	0.00			2170000.00	-0.27	1337700.52	0.1107886	0	
75	Copper			1040000	-0.74	276185.843	0.376348023	0.00			2850000.00	-0.9	568209.82	0.2267955	0	
76	Lead			2800000	-0.8	667785.571	0.199731823	0.00			2040000.00	-0.53	789241.67	0.1743542	0	
77	Mercury			2900000	-1.14	376101.939	0.307067625	0.00			1970000.00	-1.17	242119.22	0.4077114	0	
78	Nickel			490000	-0.57	176461.46	0.485727208	0.00			2210000.00	-0.76	566235.80	0.2274063	0	
79	Zinc			1250000	-0.7	356618.721	0.318500517	0.00			3340000.00	-0.68	987651.25	0.1443854	0	
80	Silver			2400000	-1.03	379066.542	0.305399532	0.00			2400000.00	-1.03	379066.54	0.3053995	0	
81		*Note: Use this section to convert lab concentrations shown as "dissolved" to "total"														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
82											Dissolved	Total				
83	**The following formulas are used to calculate water quality criteria based on Regulation No. 2 (Act 472 of Ark 1949)**										WQC (ug/l)	WQC(ug/l)				
84	Cadmium			Acute			WER X CF1 X e(1.128[ln(hardness)]-3.828)				1.31		CF1 = 1.136672 - [0.041838*ln(hardness)]			
85				Chronic			WER X CF2 X e(0.7852[ln(hardness)]-3.490)				0.51		CF2 = 1.101672 - [0.041838*ln(hardness)]			
86																
87	Chromium Tri			Acute			WER X 0.316 X e(0.819[ln(hardness)]+3.688				250.57					
88				Chronic			WER X 0.86 X e(0.819[ln(hardness)]+1.561				81.28					
89																
90	Chromium Hex			Acute			WER X 0.982 X 16				15.71					
91				Chronic			WER X 11 X 0.962				10.58					
92																
93	Copper			Acute			WER X 0.96 X e(0.9422[ln(hardness)]-1.464)				6.91					
94				Chronic			WER X 0.96 X e(0.8545[ln(hardness)]-1.465)				5.01					
95																
96	Lead			Acute			WER X e(1.273[ln(hardness)]-1.460)*CF3				22.46		CF3 = 1.46203 - [0.145712*ln(hardness)]			
97				Chronic			WER X e(1.273[ln(hardness)]-4.705)*CF3				0.88					
98																
99	Mercury			Acute			WER X 0.85 X 2.4				2.04					
100				Chronic			WER X 0.012				0.01					
101																
102	Nickel			Acute			WER X 0.998 X e(0.8460[ln(hardness)]+3.3612)				629.83					
103				Chronic			WER X 0.997 X e(0.8460[ln(hardness)]+1.1645)				69.95					
104																
105	Zinc			Acute			WER X 0.978 X e(0.8473[ln(hardness)]+0.8604)				50.86					
106				Chronic			WER X 0.986 X e(0.8473[ln(hardness)]+0.7614)				46.45					
107																
108	Silver			Acute			WER X 0.85 X e(1.72[ln(hardness)]-6.52)				0.67					
109																
110	Cyanide			Acute			WER X 22.36				22.36					
111				Chronic			WER X 5.2				5.20					
112																
113	Arsenic			Acute			WER X 360				360.00					
114				Chronic			WER X 190				190.00					
115																
116	Beryllium			Acute			WER X 130				130.00					
117				Chronic			WER X 5.3				5.30					
118																
119	Selenium			Acute			WER X 20				20.00					
120				Chronic			WER X 5				5.00					
121																
122	The following formulas are applicable to the Jet Stream Model for lakes for calculating the Dilution Factor (DF):															
123			DF = ((2.8 * D * 3.1416^0.5) / X)		where DF is % of effluent at distance X, D is the diameter of the outfall pipe											
124				and X is aquatic life criteria--25 feet for ZID; 100 feet for mixing zone; human health criteria 200 feet for mixing zone.												
125			DF =	#VALUE!	Acute	#VALUE!	Chronic	#VALUE!	Bioacc.							
126																
127	The following formulas are used to calculate the instream waste concentration (IWC) for each pollutant:															
128																
129			IWC = [(Frac X Critical Flow X Cb) + (2.13 X Ce X Qd)] / [Frac X Critical Flow + Qd] where the critical flow is the 7Q10 except for lakes with the Jet Stream Model.													
130			Use EPA Statistical Factor of 2.13 for less than 20 Ce data points with the Geometric Mean of the Ce's; use 1 for more than 20 data points with the maximum Ce.													
131			IWC = (DF X Ce) + Cb for lakes with Jet Stream Model.													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
132	POLLUTANTS		Number of Data points	MQL	EPA Statistical	Background Conc. Cb	Effluent Conc. Ce	Domestic Supply IWC	Acute Aquatic IWC	Chronic Aquatic IWC	Bioacc. IWC	Domestic Criteria	Arkansas Acute Aquatic Criteria	Arkansas Chronic Aquatic	Arkansas Bioacc.	
133				ug/l	Factor	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
137	**METALS AND CYANIDE**															
138	1. Antimony Total		1	60	2.13	0	0	0.00	0.00	0.00	0.00	#########	9000.00	1600.00	10	
139	2. Arsenic Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	50	640.31	337.94	1.4	
140	3. Beryllium Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	#########	130.00	5.30	4	
141	4. Cadmium Total		1	1	2.13	0	1.17	0.16	1.67	0.42	0.16	10	5.45	2.12	10.00	
142	6. Chromium (Tri)		1	10	2.13	0	5.66	0.76	8.10	2.05	0.76	50	1205.00	390.89	50.00	
143	7. Chromium (hex)		1	10	2.13	0	5.66	0.76	8.10	2.05	0.76	50	15.71	10.58	50.00	
144	8. Copper Total		1	0.5	2.13	0	11.7	1.58	16.74	4.23	1.58	#########	19.89	14.42	1000.00	
145	9. Lead Total		1	0.5	2.13	0	3.13	0.42	4.48	1.13	0.42	50	112.47	4.38	50.00	
146	10. Mercury Total		1	0.005	2.13	0	0.009	0.00	0.01	0.00	0.00	2	6.64	0.012	2	
147	12. Nickel Total		1	0.5	2.13	0	7.87	1.06	11.26	2.85	1.06	#########	1296.68	144.01	4600	
148	13. Selenium Total		1	5	2.13	0	11.3	1.52	16.16	4.09	1.52	10	20.00	5.00	#########	
149	14. Silver Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	50	2.18	#########	#########	
150	15. Thallium Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	#########	1400.00	#########	6.3	
151	16. Zinc Total		1	20	2.13	0	251	33.79	359.02	90.75	33.79	#########	159.70	145.83	#########	
152	129. Phenols, Total		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	700.00	350.00	#########	
153	17. Cyanide Total		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	45.90	5.4	663.8	
156	**DIOXIN**															
157	18. 2-3-7-8-TCDD		1	0.00001	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.01	1.00E+07	7.10E-07	
159	**VOLATILE COMPOUNDS**															
160	19. Acrolein		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	68	21	780	
161	20. Acrylonitrile		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	7550	2600	6.6	
162	21. Benzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	2249	1125	0.58	
163	22. Bromoform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	2930	1465.00	3.9	
164	23. Carbon Tetrach		1	2	2.13	0	0	0.00	0.00	0.00	0.00	5	2730	1365.00	0.22	
165	24. Chlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	250	50	2.10E+04	
166	25. Chlorodibromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	340	
167	26. Chloroethane		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
168	27. 2-Chloroethylvinyl ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
169	28. Chloroform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	2890	1445	5.3	
170	29. Dichlorobromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	220	
171	30. 1-1-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	7	9999999.00	#########	#########	
172	31. 1-2-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	11800	5900	0.36	
173	32. 1-1-Dichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1160	580.00	0.05	
174	33. 1,2 Dichloropropane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	23000	5700	#########	
175	34. 1,3 Dichloropropylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	6060	244	1700	
176	35. Ethylbenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	3200	1600.00	29000	
177	37. Methyl Chloride		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	55000.00	275000.00	#########	
178	36. Methyl bromide		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	4000	
179	38. Methylene chloride		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	19300.00	9650.00	4.4	
180	39. 1-1-2-2-Tetrachloroetha		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	932	466	0.16	
181	40. Tetrachloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1290	645	0.65	
182	41. Toluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1270	635.00	6.10E+03	
183	42. 1,2-trans-dichloroethyler		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
184	44. 1-1-2-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1800	900	0.56	
185	43. 1-1-1-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	200	5280	2640.00	200.00	
186	45. Trichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	3900	1950	2.8	
187	46. Vinyl Chloride		1	10	2.13	0	0	0.00	0.00	0.00	0.00	2	9999999.00	#########	0.0237	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
189	**ACID COMPOUNDS**															
190	47. 2-Chlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	258	129.00	0.10	
191	48. 2-4-Dichlorphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	202	101	0.30	
192	49. 2-4 Dimethylphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
193	50. 4,6-Dinitro-o-Cresol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	765	
194	51. 2,4-Dinitrophenol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14000	
195	52.-53. Nitrophenols		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	230	150	#########	
196	54. 4 Chloro-3-methylpheno		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	30	#########	#########	
197	55. Pentachlorophenol		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9.16	5.78	82	
198	56. Phenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	10200	2560	4600000	
199	57. 2-4-6-Trichlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	65	
201						Ambient Background Conc.	Effluent Conc.	Domestic Supply	Acute Aquatic	Chronic Aquatic	Human Health	Domestic Criteria	Acute Aquatic Criteria	Chronic Aquatic Criteria	Human Health Criteria	
202	**BASE/NEUTRAL COMPOUNDS**				2.13	Cb	Ce	IWC	IWC	IWC	IWC	ug/l	ug/l	ug/l	ug/l	
203	58. Acenaphthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1700	520	#########	
204	59. Acenapthylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
205	60. Anthracene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	110000	
206	61. Benzidine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	250	125.00	8.00E-05	
207	62. Benzo(a) antnracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
208	63. Benzo(a) pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
209	64. 3,4-benzoflouranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
210	65. Benzo(g,h,i)perylene		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
211	66. Benzo(k) fluoranthene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
212	67. Bis(2-chloroethoxy)meth		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
213	68. Bis(2-chloroethly) Ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14	
214	69. Bis(2-Chloroisopropyl) e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.70E+05	
215	70. Bis(2-ethylhexyl)phthala		1	10	2.13	0	2.87	0.39	4.11	1.04	0.39	#########	9999999.00	#########	59	
216	71. 4-Bromophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
217	72. Butylbenzy phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
218	73. 2-chloronapthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1600	#########	#########	
219	74. 4-chlorophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
220	75. Chrysene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
221	76. Dibenzo(a,h)anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
222	77-79. Dichlorobenzene(1,2		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1120	763	2600	
223	80. 3,3' Dichlorobenzidine		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.77	
224	81. Diethyl Phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.20E+05	
225	82. Dimethyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	2.90E+06	
226	83. Di-n-Butyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.20E+04	
227	84. 2-4-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	330	230	91	
228	85. 2-6-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
229	86. Di-n-octyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
230	87. 1,2-diphenylhydrazine		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	270	#########	5.4	
231	88. Fluoranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	3980	#########	370	
232	89. Fluorene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14000	
233	90. Hexachlorobenzene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.00025	
234	91. Hexachlorobutadiene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	5.10	1.02	0.09	
235	92. Hexachlorocyclopentadi		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	7	5.2	1.74E+04	
236	93. Hexachloroethane		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	980	540	89	
237	Hexachlorocyclohexane		1		2.13	0	0	0.00	0.00	0.00	0.00	#########	2	0.08	#########	
238	94. Indeno(1.2,3-cd)pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
239	95. Isophorone		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	117000	#########	6000	
240	96. Naphthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	2300	620	#########	
241	97. Nitrobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	27000	#########	1900	
242	98. N-nitrosodimethylamine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	81	
243	99. N-nitrosodi-n-propylamir		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
244	100. N-nitrosodiphenylamin		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	160	
245	101. Phenanthrene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
246	103. 1,2,4-trichlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
247																
248	**PESTICIDES**															
249	104. Aldrin		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	3.00	#########	0.00004	
250	105. Alpha-BHC		1	0.05	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.00	0.08	0.0373	
251	106. Beta-BHC		1	0.05	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.00	0.08	0.46	
252	107. Gamma-BHC		1	0.05	2.13	0	0.969	0.13	1.39	0.35	0.13	#########	5.30	0.21	0.11	
253	108. Delta-BHC		1	0.05	2.13	0	0.0407	0.01	0.06	0.01	0.01	#########	2.00	0.08	#########	
254	109. Chlordane		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.40	0.0043	0.00019	
255	110. 4,4'-DDT		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	1.10	0.001	0.00019	
256	111. 4,4'-DDE		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	52.50	10.5	0.00019	
257	112. 4,4'-DDD		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.03	0.006	0.00027	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
258	113. Dieldrin		1	0.02	2.13	0	0.113	0.02	0.16	0.04	0.02	#########	0.24	0.0557	0.00005	
259	114. Alpha-endosulfan		1	0.01	2.13	0	0.0211	0.00	0.03	0.01	0.00	#########	0.22	0.056	2	
260	115. Beta-endosulfan		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
261	116. Endosulfan sulfate		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
262	117. Endrin		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	0.2	0.09	0.0375	0.81	
263	118. Endrin aldehyde		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.18	0.0023	0.81	
264	119. Heptachlor		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.00007	
265	120. Heptachlor epoxide		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.0011	
266	121. PCB-1242		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
267	122. PCB-1254		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
268	123. PCB-1221		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
269	124. PCB-1232		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
270	125. PCB-1248		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
271	126. PCB-1260		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
272	127. PCB-1016		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
273	128. Toxaphene		1	0.3	2.13	0	0	0.00	0.00	0.00	0.00	5	0.73	0.0002	0.00024	
274	130. Chlorpyrifos		1	0.07	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.08	0.041	#########	
275																
276																
277																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
278																
279	STEP 3:	APPLICABLE WATER QUALITY-BASED LIMITS														
280																
281																
282																
283	POLLUTANTS		Permit Daily Maximum	Permit Monthly Average	Permit Daily Maximum	Permit Monthly Average		EPA Bioac Status								
284			ug/l	ug/l	lb/day	lb/day										
285	Alpha-BHC		NO	NO	NO	NO		N/A								
286	Beta-BHC		NO	NO	NO	NO		N/A								
287	Gamma-BHC		2.770	1.381	1.211	0.603		N/A								
288	Delta-BHC		NO	NO	NO	NO		N/A								
289	Pentachlorophenol		NO	NO	NO	NO		N/A								
290	Aldrin		NO	NO	NO	NO		N/A								
291	Chlordane		NO	NO	NO	NO		N/A								
292	4,4'-DDT		NO	NO	NO	NO		N/A								
293	4,4'-DDE		NO	NO	NO	NO		N/A								
294	4,4'-DDD		NO	NO	NO	NO		N/A								
295	Dieldrin		0.002	0.001	0.001	0.000		N/A								
296	Alpha-endosulfan		NO	NO	NO	NO		N/A								
297	Beta-endosulfan		NO	NO	NO	NO		N/A								
298	Endosulfan sulfate		NO	NO	NO	NO		N/A								
299	Endrin		NO	NO	NO	NO		N/A								
300	Endrin aldehyde		NO	NO	NO	NO		N/A								
301	Heptachlor		NO	NO	NO	NO		N/A								
302	Heptachlor epoxide		NO	NO	NO	NO		N/A								
303	Toxaphene		NO	NO	NO	NO		N/A								
304	Chlorpyrifos		NO	NO	NO	NO		N/A								
305	Cadmium Total		NO	NO	NO	NO		N/A								
306	Chromium (hex)		NO	NO	NO	NO		N/A								
307	Copper Total		NO	NO	NO	NO		N/A								
308	Lead Total		NO	NO	NO	NO		N/A								
309	Mercury Total		NO	NO	NO	NO		N/A								
310	Nickel Total		NO	NO	NO	NO		N/A								
311	Selenium Total		NO	NO	NO	NO		N/A								
312	Silver Total		NO	NO	NO	NO		N/A								
313	Zinc Total		421.57	210.11	184.23	91.82		N/A								
314	Chromium (Tri)		NO	NO	NO	NO		N/A								
315	Cyanide Total		NO	NO	NO	NO		N/A								
316	Beryllium Total		NO	NO	NO	NO		N/A								
317	PCB-1242		NO	NO	NO	NO		N/A								
318	PCB-1254		NO	NO	NO	NO		N/A								
319	PCB-1221		NO	NO	NO	NO		N/A								
320	PCB-1232		NO	NO	NO	NO		N/A								
321	PCB-1248		NO	NO	NO	NO		N/A								
322	PCB-1260		NO	NO	NO	NO		N/A								
323	PCB-1016		NO	NO	NO	NO		N/A								
324	2-3-7-8-TCDD		NO	NO	NO	NO		N/A								
325	Antimony							NO								
326	Arsenic							NO								
327	Thallium							NO								
328	Acrolein							NO								
329	Acrylonitrile							NO								
330	Benzene							NO								
331	Bromoform							NO								
332	Carbon Tetrach							NO								
333	Chlorodibromomethane							NO								
334	Chloroform							NO								
335	Dichlorobromomethane							NO								

Henderson, Katie

From: Reiber, Loretta
Sent: Tuesday, June 01, 2010 8:48 AM
To: Henderson, Katie
Subject: FW: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 3 of 4)

-----Original Message-----
From: Tillman.Michael@epamail.epa.gov [mailto:Tillman.Michael@epamail.epa.gov]
Sent: Tuesday, August 04, 2009 9:42 AM
To: bruce.fielding@la.gov
Cc: Reiber, Loretta; Bailey, John; Baskin.Kilty@epamail.epa.gov
Subject: Fw: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 3 of 4)

---- Forwarded by Michael Tillman/R6/USEPA/US on 08/04/2009 09:51 AM -----

FW: GP Crossett, NPDES Permit No. AR0001210

Reiber, Loretta to: Michael Tillman 07/29/2009 02:41 PM

-----Original Message-----
From: Reiber, Loretta
Sent: Wednesday, July 29, 2009 2:38 PM
To: 'Tillman.Michael@epamail.epa.gov'
Subject: GP Crossett, NPDES Permit No. AR0001210

Mike,

Attached are the Priority Pollutant Scan calculations and ADEQ's review. ADEQ is requesting a review of these documents in order to confirm compliance with LDEQ's procedures at SMS2.

If you have any questions, please feel free to contact me at (501) 682-0612 or by e-mail at reiber@adeq.state.ar.us.

Loretta Reiber, P.E.
Engineer, NPDES Permits

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1						CALCULATIONS OF ARKANSAS WATER QUALITY-BASED EFFLUENT LIMITATIONS										
2								For an Arkansas River/Stream								
3								(Reserved)								
4	STEP 1:	INPUT TWO LETTER CODE FOR ECOREGION (Use Code at Right)						GC								
5		Basin Name						Ouachita River								
6											Codes & TSS for Ecoregions and Large Rivers					
7	FACILITY															
8										Ouachita Mts. Eco (OM) =		2.0 mg/l	Arkansas (Ft. Smith to Dardanelle Dam			12.0 mg/l
9	Permittee							GP Crossett		Ozark Highlands Eco (OH) =		2.5 mg/l	Arkansas (Dardanelle Dam to Terry L&			10.5 mg/l
10	NPDES Permit No.							AR0001210		Boston Mts. Eco (BM) =		1.3 mg/l	Arkansas (Terry L&D to L&D No. 5)			8.3 mg/l
11	Outfall No.(s)							001		Ark River Valley Eco (AV) =		3.0 mg/l	Arkansas (L&D No. 5 to Mouth)			9.0 mg/l
12	Plant Effluent Flow (MGD)							52.40		Gulf Coastal Eco (GC) =		5.5 mg/l	White (Above Beaver Lake)			2.5 mg/l
13	Plant Effluent Flow (cfs)							80.96		Delta Ecoregion (DL) =		8.0 mg/l	White (Below Bull Shoals to Black Riv			3.3 mg/l
14													White (From Black River to Mouth)			18.5 mg/l
15	RECEIVING STREAM												St. Francis River			18.0 mg/l
16													Ouachita (Above Caddo River)			2.0 mg/l
17	Is this a large river? (see list at right)(enter "1" if yes, "0" if no, make entry as a number)							0					Ouachita (Below Caddo River)			5.5 mg/l
18	Name of Receiving Stream:							Coffee Creek					Red River			33.0 mg/l
19	Waterbody Segment Code No.							2D								
20	Is this a lake or reservoir? (enter '1' if yes, ' 0 ' = no; make entry as a number)							0			Total Hardness for:					
21	Second Enter Enter 7Q10 in Cell H31							0			Arkansas River = 125 mg/l			Red River = 211 mg/l		
22	(Reserved)	DO NOT INPUT DATA INTO CELL H22, H23 & H24...LEAVE BLANK=						(Reserved)			Ouachita River = 28 mg/l			St. Francis River = 103 mg/l		
23	(Reserved)										White River = 116 mg/l					
24		(Reserved)		(Reserved)				(Reserved)								
25				(Reserved)				(Reserved)			Gulf Coastal = 31 mg/l			Ouachita Mount = 31 mg/l		
26				(Reserved)				(Reserved)			Ozark Highlands = 148 mg/l			Ark River Valley = 25 mg/l		
27				(Reserved)				(Reserved)			Boston Mount = 25 mg/l			Delta = 81 mg/l		
28																
29	Ecoregion TSS (mg/l) (For Large River, See List to Right)							5.50			Large Rivers					
30	Ecoregion Hardness (mg/l)							31.00			Mississippi River, Arkansas River, Red River					
31	Enter 7Q10 (cfs) as the Critical Flow			(Reserved)	(Reserved)			0.00	(Reserved		White (Below confluence with Black River)					
32	Long Term Ave / Harmonic Mean Flow (cfs)							0.00	(Reserved	(Reserved)	Ouachita (Below confluence with Little Miss. River)					
33	Using Diffusers (Yes/No)							no								
34	pH (Avg)							7.01			For industrial and federal facility, use the highest monthly average flow					
35	Percent (%) of Critical Flow for Chronic Criteria							0.67			for the past 24 months. For POTWs, use the design flow.					
36	Percent (%) of Critical Flow for Acute Criteria							0.33								
37	Water Effect Ratio (WER)							1.00			#VALUE! => No violation or Not Applicable					
38	Ave Monthly Limit LTA Multiplier (Ref: page 103 TSD for WQ-Based Toxics Control)							1.55			9999999.00 => No EPA/ADEQ Guideline					
39	Max Daily Limit LTA Multiplier (Ref: " " " ")							3.11								

STEP 2: INPUT AMBIENT AND EFFLUENT DATA
CALCULATE IN-STREAM WASTE CONCENTRATIONS

DATA INPUT

For less than 20 data points enter geometric mean concentration as micro-gram per liter (ug/l or ppb).
For 20 or more data points in set enter highest concentration as micro-gram per liter (ug/l or ppb).

Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, the 1/2 DL is used.
Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, "0" is used.
If a firm value is reported, even less than MQL, the reported value is used.

The following formulae is used to calculate the Instream Waste Concentration (IWC)
(Please refer to CPP for detail)
IWC = [(F*Qa*Cb) + (Qe*2.13*Ce)] / (F*Qa + Qe)
Where:
IWC = Instream Waste Concentration
F = Fraction of stream allowed for mixing
Ce = Reported concentration in effluent
Cb = Ambient stream concentration upstream of discharge
Qe = Plant effluent flow
Qb = Critical low flow of stream at discharge point expressed as the 7Q10 or harmonic mean flow for human health criteria
Upstream Flow (Qb)= (% of 7Q10) X 7Q10 for Chronic and Acute

The following formulae convert metals reported in total form to dissolved form if criteria are in dissolved form

Kp = Kpo * (TSS**a)
C/Ct = 1/ (1 + Kp*TSS* 10^-6)
Total Metal Criteria (Ct) = Cr / (C/Ct)

Kp = Linear partition coefficient; Kpo and a can be found in table below
TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)
C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value

Total Metals	Dissolved Value in Stream	*Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert t				Lake Linear Partition Coefficient				
		Kpo	alpha (a)	Kp	C/Ct	Total Value	Kpo	alpha (a)	Kp	C/Ct	Total Value
Arsenic		480000	-0.73	138285.446	0.56799788	0.00	480000.00	-0.73	138285.45	0.5679979	0
Cadmium		4000000	-1.13	582706.889	0.237818469	0.00	3520000.00	-0.92	733514.98	0.1986361	0
Chromium(3)		3360000	-0.93	688338.365	0.208948818	0.00	2170000.00	-0.27	1369499.28	0.1172024	0
Copper		1040000	-0.74	294554.016	0.381672529	0.00	2850000.00	-0.9	614495.12	0.2283249	0
Lead		2800000	-0.8	715925.58	0.202527926	0.00	2040000.00	-0.53	826490.64	0.1803199	0
Mercury		2900000	-1.14	415321.613	0.30448177	0.00	1970000.00	-1.17	268066.09	0.4041443	0
Nickel		490000	-0.57	185433.992	0.495077211	0.00	2210000.00	-0.76	604946.03	0.2310962	0
Zinc		1250000	-0.7	379014.766	0.324193117	0.00	3340000.00	-0.68	1047851.74	0.1478593	0
Silver		2400000	-1.03	414607.994	0.30484608	0.00	2400000.00	-1.03	414607.99	0.3048461	0

*Note: Use this section to convert lab concentrations shown as "dissolved" to "total"

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
82											Dissolved	Total				
83	**The following formulas are used to calculate water quality criteria based on Regulation No. 2 (Act 472 of Ark 1949)**										WQC (ug/l)	WQC(ug/l)				
84	Cadmium			Acute			WER X CF1 X e(1.128[ln(hardness)]-3.828)				1.04		CF1 = 1.136672 - [0.041838*ln(hardness)]			
85				Chronic			WER X CF2 X e(0.7852[ln(hardness)]-3.490)				0.43		CF2 = 1.101672 - [0.041838*ln(hardness)]			
86																
87	Chromium Tri			Acute			WER X 0.316 X e(0.819[ln(hardness)]+3.688				210.28					
88				Chronic			WER X 0.86 X e(0.819[ln(hardness)]+1.561				68.21					
89																
90	Chromium Hex			Acute			WER X 0.982 X 16				15.71					
91				Chronic			WER X 11 X 0.962				10.58					
92																
93	Copper			Acute			WER X 0.96 X e(0.9422[ln(hardness)]-1.464)				5.64					
94				Chronic			WER X 0.96 X e(0.8545[ln(hardness)]-1.465)				4.17					
95																
96	Lead			Acute			WER X e(1.273[ln(hardness)]-1.460)*CF3				17.68		CF3 = 1.46203 - [0.145712*ln(hardness)]			
97				Chronic			WER X e(1.273[ln(hardness)]-4.705)*CF3				0.69					
98																
99	Mercury			Acute			WER X 0.85 X 2.4				2.04					
100				Chronic			WER X 0.012				0.01					
101																
102	Nickel			Acute			WER X 0.998 X e(0.8460[ln(hardness)]+3.3612)				525.50					
103				Chronic			WER X 0.997 X e(0.8460[ln(hardness)]+1.1645)				58.36					
104																
105	Zinc			Acute			WER X 0.978 X e(0.8473[ln(hardness)]+0.8604)				42.43					
106				Chronic			WER X 0.986 X e(0.8473[ln(hardness)]+0.7614)				38.74					
107																
108	Silver			Acute			WER X 0.85 X e(1.72[ln(hardness)]-6.52)				0.46					
109																
110	Cyanide			Acute			WER X 22.36				22.36					
111				Chronic			WER X 5.2				5.20					
112																
113	Arsenic			Acute			WER X 360				360.00					
114				Chronic			WER X 190				190.00					
115																
116	Beryllium			Acute			WER X 130				130.00					
117				Chronic			WER X 5.3				5.30					
118																
119	Selenium			Acute			WER X 20				20.00					
120				Chronic			WER X 5				5.00					
121																
122	The following formulas are applicable to the Jet Stream Model for lakes for calculating the Dilution Factor (DF):															
123			DF = ((2.8 * D * 3.1416^0.5) / X)				where DF is % of effluent at distance X, D is the diameter of the outfall pipe									
124				and X is aquatic life criteria--25 feet for ZID; 100 feet for mixing zone; human health criteria 200 feet for mixing zone.												
125			DF =	#VALUE!	Acute	#VALUE!	Chronic	#VALUE!	Bioacc.							
126																
127	The following formulas are used to calculate the instream waste concentration (IWC) for each pollutant:															
128																
129			IWC = [(Frac X Critical Flow X Cb) + (2.13 X Ce X Qd)] / [Frac X Critical Flow + Qd] where the critical flow is the 7Q10 except for lakes with the Jet Stream Model.													
130			Use EPA Statistical Factor of 2.13 for less than 20 Ce data points with the Geometric Mean of the Ce's; use 1 for more than 20 data points with the maximum Ce.													
131			IWC = (DF X Ce) + Cb for lakes with Jet Stream Model.													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
132	POLLUTANTS		Number of Data points	MQL	EPA Statistical	Background Conc. Cb	Effluent Conc. Ce	Domestic Supply IWC	Acute Aquatic IWC	Chronic Aquatic IWC	Bioacc. IWC	Domestic Criteria	Arkansas Acute Aquatic Criteria	Arkansas Chronic Aquatic	Arkansas Bioacc.	
133				ug/l	Factor	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
137	**METALS AND CYANIDE**															
138	1. Antimony Total		1	60	2.13	0	0	0.00	0.00	0.00	0.00	########	9000.00	1600.00	4300	
139	2. Arsenic Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	50	633.81	334.51	1.4	
140	3. Beryilium Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	########	130.00	5.30	4	
141	4. Cadmium Total		1	1	2.13	0	0	0.00	0.00	0.00	0.00	10	4.37	1.82	#########	
142	6. Chromium (Tri)		1	10	2.13	0	4.3	9.16	9.16	9.16	9.16	50	1006.35	326.45	#########	
143	7. Chromium (hex)		1	10	2.13	0	4.3	9.16	9.16	9.16	9.16	50	15.71	10.58	#########	
144	8. Copper Total		1	0.5	2.13	0	6.79	14.46	14.46	14.46	14.46	#########	14.79	10.93	#########	
145	9. Lead Total		1	0.5	2.13	0	2.37	5.05	5.05	5.05	5.05	50	87.29	3.40	#########	
146	10. Mercury Total		1	0.005	2.13	0	0.00833	0.02	0.02	0.02	0.02	2	6.70	0.012	0.15	
147	12. Nickel Total		1	0.5	2.13	0	7.07	15.06	15.06	15.06	15.06	########	1061.45	117.88	4600	
148	13. Selenium Total		1	5	2.13	0	2.22	4.73	4.73	4.73	4.73	10	20.00	5.00	#########	
149	14. Silver Total		1	0.5	2.13	0	3.58	7.63	7.63	7.63	7.63	50	1.51	#########	#########	
150	15. Thallium Total		1	0.5	2.13	0	2.96	6.3048	6.3048	6.3048	6.3048	########	1400.00	#########	6.3	
151	16. Zinc Total		1	20	2.13	0	373	794.49	794.49	794.49	794.49	#########	130.87	119.50	#########	
152	129. Phenols, Total		1	5	2.13	0	0.0445	0.09	0.09	0.09	0.09	#########	9999999.00	#########	#########	
153	17. Cyanide Total		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	22.36	5.2	220000	
156	**DIOXIN**															
157	18. 2-3-7-8-TCDD		1	0.00001	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.01	1.00E+07	1.00E-06	
159	**VOLATILE COMPOUNDS**															
160	19. Acrolein		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	68	21	780	
161	20. Acrylonitrile		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	7550	2600	6.6	
162	21. Benzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	5300	9999999	710	
163	22. Bromoform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	3600	
164	23. Carbon Tetrach		1	2	2.13	0	0	0.00	0.00	0.00	0.00	5	35200	#########	44	
165	24. Chlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	250	50	2.10E+04	
166	25. Chlorodibromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	340	
167	26. Chloroethane		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
168	27. 2-Chloroethylvinyl ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
169	28. Chloroform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	28900	1240	4700	
170	29. Dichlorobromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	220	
171	30. 1-1-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	7	9999999.00	#########	#########	
172	31. 1-2-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	11800	20000	990	
173	32. 1-1-Dichlorethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	11600	#########	32	
174	33. 1,2 Dichloropropane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	23000	5700	#########	
175	34. 1,3 Dichloropropylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	6060	244	1700	
176	35. Ethylbenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	32000	#########	29000	
177	37. Methyl Chloride		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
178	36. Methyl bromide		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	4000	
179	38. Methylene chloride		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	16000	
180	39. 1-1-2-2-Tetrachloroetha		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9320	2400	110	
181	40. Tetrachloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	5280	840	88.5	
182	41. Toluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	17500	#########	2.00E+05	
183	42. 1,2-trans-dichloroethyler		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
184	44. 1-1-2-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	18000	9400	420	
185	43. 1-1-1-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	200	18000	#########	#########	
186	45. Trichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	45000	21900	810	
187	46. Vinyl Chloride		1	10	2.13	0	0	0.00	0.00	0.00	0.00	2	9999999.00	#########	5250	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
189	**ACID COMPOUNDS**												9999999.00	########	########	
190	47. 2-Chlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	4380	########	########	
191	48. 2-4-Dichlorphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	2020	365	########	
192	49. 2-4 Dimethylphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
193	50. 4,6-Dinitro-o-Cresol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	765	
194	51. 2,4-Dinitrophenol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	14000	
195	52.-53. Nitrophenols		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	230	150	########	
196	54. 4 Chloro-3-methylpheno		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	30	########	########	
197	55. Pentachlorophenol		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9.16	5.78	82	
198	56. Phenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	10200	2560	4600000	
199	57. 2-4-6-Trichlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	65	
201						Ambient Background Conc.	Effluent Conc.	Domestic Supply	Acute Aquatic	Chronic Aquatic	Human Health	Domestic Criteria	Acute Aquatic Criteria	Chronic Aquatic Criteria	Human Health Criteria	
202	**BASE/NEUTRAL COMPOUNDS**				2.13	Cb	Ce	IWC	IWC	IWC	IWC	ug/l	ug/l	ug/l	ug/l	
203	58. Acenaphthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	1700	520	########	
204	59. Acenapthylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
205	60. Anthracene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	110000	
206	61. Benzidine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	########	2500	########	5.40E-03	
207	62. Benzo(a) anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
208	63. Benzo(a) pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
209	64. 3,4-benzoflouranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
210	65. Benzo(g,h,i)perylene		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
211	66. Benzo(k) fluoranthene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
212	67. Bis(2-chloroethoxy)meth		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
213	68. Bis(2-chloroethly) Ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	14	
214	69. Bis(2-Chloroisopropyl) e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	1.70E+05	
215	70. Bis(2-ethylhexyl)phthala		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	59	
216	71. 4-Bromophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
217	72. Butylbenzy phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
218	73. 2-chloronapthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	1600	########	########	
219	74. 4-chlorophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
220	75. Chrysene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
221	76. Dibenzo(a,h)anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
222	77-79. Dichlorobenzene(1,2		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	1120	763	2600	
223	80. 3,3' Dichlorobenzidine		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.77	
224	81. Diethyl Phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	1.20E+05	
225	82. Dimethyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	2.90E+06	
226	83. Di-n-Butyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	1.20E+04	
227	84. 2-4-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	330	230	91	
228	85. 2-6-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
229	86. Di-n-octyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
230	87. 1,2-diphenylhydrazine		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	270	########	5.4	
231	88. Fluoranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	3980	########	370	
232	89. Fluorene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	14000	
233	90. Hexachlorobenzene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.0077	
234	91. Hexachlorobutadiene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	90	9.3	500	
235	92. Hexachlorocyclopentadi		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	7	5.2	1.74E+04	
236	93. Hexachloroethane		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	980	540	89	
237	Hexachlorocyclohexane		1		2.13	0	0	0.00	0.00	0.00	0.00	########	2	0.08	########	
238	94. Indeno(1,2,3-cd)pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	0.31	
239	95. Isophorone		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	117000	########	6000	
240	96. Naphthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	2300	620	########	
241	97. Nitrobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	27000	########	1900	
242	98. N-nitrosodimethylamine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	81	
243	99. N-nitrosodi-n-propylamir		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
244	100. N-nitrosodiphenylamine		1	20	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	160	
245	101. Phenanthrene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
246	103. 1,2,4-trichlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999.00	########	########	
247																
248	**PESTICIDES**															
249	104. Aldrin		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	########	3.00	########	0.0014	
250	105. Alpha-BHC		1	0.05	2.13	0	0.0501	0.11	0.11	0.11	0.11	########	2.00	0.08	0.0373	
251	106. Beta-BHC		1	0.05	2.13	0	0	0.00	0.00	0.00	0.00	########	2.00	0.08	0.46	
252	107. Gamma-BHC		1	0.05	2.13	0	0.0642	0.14	0.14	0.14	0.14	########	2.00	0.08	0.63	
253	108. Delta-BHC		1	0.05	2.13	0	0.0688	0.15	0.15	0.15	0.15	########	2.00	0.08	########	
254	109. Chlordane		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	########	2.40	0.0043	0.005	
255	110. 4,4'-DDT		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	########	1.10	0.001	0.0059	
256	111. 4,4'-DDE		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	########	1.10	0.001	0.0059	
257	112. 4,4'-DDD		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	########	1.10	0.001	0.0084	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
258	113. Dieldrin		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.50	0.0019	0.0012	
259	114. Alpha-endosulfan		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
260	115. Beta-endosulfan		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
261	116. Endosulfan sulfate		1	0.1	2.13	0	0.0662	0.14	0.14	0.14	0.14	#########	0.22	0.056	2	
262	117. Endrin		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	0.2	0.18	0.0023	0.81	
263	118. Endrin aldehyde		1	0.1	2.13	0	0.269	0.57	0.57	0.57	0.57	#########	0.18	0.0023	0.81	
264	119. Heptachlor		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.0021	
265	120. Heptachlor epoxide		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.0011	
266	121. PCB-1242		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
267	122. PCB-1254		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
268	123. PCB-1221		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
269	124. PCB-1232		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
270	125. PCB-1248		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
271	126. PCB-1260		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
272	127. PCB-1016		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
273	128. Toxaphene		1	0.3	2.13	0	0	0.00	0.00	0.00	0.00	5	0.73	0.0002	0.00045	
274	130. Chlorpyrifos		1	0.07	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.08	0.041	#########	
275																
276																
277																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
278																
279	STEP 3:	APPLICABLE WATER QUALITY-BASED LIMITS														
280																
281																
282																
283	POLLUTANTS		Permit Daily Maximum	Permit Monthly Average	Permit Daily Maximum	Permit Monthly Average		EPA Bioac Status								
284			ug/l	ug/l	lb/day	lb/day										
285	Alpha-BHC		0.12	0.04	0.05	0.02		N/A								
286	Gamma-BHC		0.18	0.09	0.08	0.04		N/A								
287	Delta-BHC		0.18	0.09	0.08	0.04		N/A								
288	Endosulfan sulfate		0.13	0.06	0.05	0.03		N/A								
289	Endrin aldehyde		0.005	0.003	0.002	0.001		N/A								
290	Copper Total		24.48	12.20	10.70	5.33		N/A								
291	Lead Total		7.62	3.80	3.33	1.66		N/A								
292	Mercury Total		0.03	0.01	0.01	0.01		N/A								
293	Silver Total		2.68	1.33	1.17	0.58		N/A								
294	Zinc Total		231.99	115.62	101.38	50.53		N/A								
295	Thallium							REPORT								

Henderson, Katie

From: Reiber, Loretta
Sent: Tuesday, June 01, 2010 8:48 AM
To: Henderson, Katie
Subject: FW: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 4 of 4)

-----Original Message-----
From: Tillman.Michael@epamail.epa.gov [mailto:Tillman.Michael@epamail.epa.gov]
Sent: Tuesday, August 04, 2009 9:43 AM
To: bruce.fielding@la.gov
Cc: Reiber, Loretta; Bailey, John; Baskin.Kilty@epamail.epa.gov
Subject: Fw: GP Crossett, NPDES Permit No. AR0001210 - WQ screens (Part 4 of 4)

----- Forwarded by Michael Tillman/R6/USEPA/US on 08/04/2009 09:52 AM -----

FW: GP Crossett, NPDES Permit No. AR0001210

Reiber, Loretta to: Michael Tillman 07/29/2009 02:42 PM

-----Original Message-----
From: Reiber, Loretta
Sent: Wednesday, July 29, 2009 2:38 PM
To: 'Tillman.Michael@epamail.epa.gov'
Subject: GP Crossett, NPDES Permit No. AR0001210

Mike,

Attached are the Priority Pollutant Scan calculations and ADEQ's review. ADEQ is requesting a review of these documents in order to confirm compliance with LDEQ's procedures at SMS2.

If you have any questions, please feel free to contact me at (501) 682-0612 or by e-mail at reiber@adeq.state.ar.us.

Loretta Reiber, P.E.
Engineer, NPDES Permits

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1						CALCULATIONS OF ARKANSAS WATER QUALITY-BASED EFFLUENT LIMITATIONS										
2								For an Arkansas River/Stream								
3								(Reserved)								
4	STEP 1:	INPUT TWO LETTER CODE FOR ECOREGION (Use Code at Right)						GC								
5		Basin Name						Ouachita River								
6											Codes & TSS for Ecoregions and Large Rivers					
7	FACILITY															
8										Ouachita Mts. Eco (OM) =		2.0 mg/l	Arkansas (Ft. Smith to Dardanelle Dam			12.0 mg/l
9	Permittee							GP Crossett		Ozark Highlands Eco (OH) =		2.5 mg/l	Arkansas (Dardanelle Dam to Terry L&			10.5 mg/l
10	NPDES Permit No.							AR0001210		Boston Mts. Eco (BM) =		1.3 mg/l	Arkansas (Terry L&D to L&D No. 5)			8.3 mg/l
11	Outfall No.(s)							SMS2		Ark River Valley Eco (AV) =		3.0 mg/l	Arkansas (L&D No. 5 to Mouth)			9.0 mg/l
12	Plant Effluent Flow (MGD)							52.40		Gulf Coastal Eco (GC) =		5.5 mg/l	White (Above Beaver Lake)			2.5 mg/l
13	Plant Effluent Flow (cfs)							80.96		Delta Ecoregion (DL) =		8.0 mg/l	White (Below Bull Shoals to Black Riv)			3.3 mg/l
14													White (From Black River to Mouth)			18.5 mg/l
15	RECEIVING STREAM												St. Francis River			18.0 mg/l
16													Ouachita (Above Caddo River)			2.0 mg/l
17	Is this a large river? (see list at right)(enter "1" if yes, "0" if no; make entry as a number)							1					Ouachita (Below Caddo River)			5.5 mg/l
18	Name of Receiving Stream:							Ouachita River					Red River			33.0 mg/l
19	Waterbody Segment Code No.							2D								
20	Is this a lake or reservoir? (enter '1' if yes, ' 0 ' = no; make entry as a number)							0			Total Hardness for:					
21	Second Enter Enter 7Q10 in Cell H31							0			Arkansas River = 125 mg/l			Red River = 211 mg/l		
22	(Reserved)	DO NOT INPUT DATA INTO CELL H22, H23 & H24....LEAVE BLANK=						(Reserved)			Ouachita River = 28 mg/l			St. Francis River = 103 mg/l		
23	(Reserved)										White River = 116 mg/l					
24		(Reserved)		(Reserved)				(Reserved)								
25				(Reserved)				(Reserved)			Gulf Coastal = 31 mg/l			Ouachita Mount = 31 mg/l		
26				(Reserved)				(Reserved)			Ozark Highlands = 148 mg/l			Ark River Valley = 25 mg/l		
27				(Reserved)				(Reserved)			Boston Mount = 25 mg/l			Delta = 81 mg/l		
28																
29	Ecoregion TSS (mg/l) (For Large River, See List to Right)							5.50			Large Rivers					
30	Ecoregion Hardness (mg/l)							28.00			Mississippi River, Arkansas River, Red River					
31	Enter 7Q10 (cfs) as the Critical Flow		(Reserved)	(Reserved)				1200.00	(Reserved		White (Below confluence with Black River)					
32	Long Term Ave / Harmonic Mean Flow (cfs)							3600.00	(Reserved	(Reserved)	Ouachita (Below confluence with Little Miss. River)					
33	Using Diffusers (Yes/No)							no								
34	pH (Avg)							7.01			For industrial and federal facility, use the highest monthly average flow					
35	Percent (%) of Critical Flow for Chronic Criteria							0.25			for the past 24 months. For POTWs, use the design flow.					
36	Percent (%) of Critical Flow for Acute Criteria							0.06								
37	Water Effect Ratio (WER)							1.00			#VALUE! => No violation or Not Applicable					
38	Ave Monthly Limit LTA Multiplier (Ref: page 103 TSD for WQ-Based Toxics Control)							1.55			9999999.00 => No EPA/ADEQ Guideline					
39	Max Daily Limit LTA Multiplier (Ref: " " " ")							3.11								

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
40																
41	**STEP 2:**	INPUT AMBIENT AND EFFLUENT DATA														
42		CALCULATE IN-STREAM WASTE CONCENTRATIONS														
43																
44	DATA INPUT			For less than 20 data points enter geometric mean concentration as micro-gram per liter (ug/l or ppb).												
45				For 20 or more data points in set enter highest concentration as micro-gram per liter (ug/l or ppb).												
46																
47				Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, the 1/2 DL is used.												
48				Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, "0" is used.												
49				If a firm value is reported, even less than MQL, the reported value is used.												
50																
51				The following formulae is used to calculate the Instream Waste Concentration (IWC)												
52				(Please refer to CPP for detail)												
53				IWC = [(F*Qa*Cb) + (Qe*2.13*Ce)] / (F*Qa + Qe)												
54				Where:												
55				IWC = Instream Waste Concentration												
56				F = Fraction of stream allowed for mixing												
57				Ce = Reported concentration in effluent												
58				Cb = Ambient stream concentration upstream of discharge												
59				Qe = Plant effluent flow												
60				Qb = Critical low flow of stream at discharge point expressed as the 7Q10 or harmonic mean flow for human health criteria												
61				Upstream Flow (Qb)= (% of 7Q10) X 7Q10 for Chronic and Acute												
62																
63	The following formulae convert metals reported in total form to dissolved form if criteria are in dissolved form															
64																
65	Kp = Kpo * (TSS**a)					Kp = Linear partition coefficient; Kpo and a can be found in table below										
66	C/Ct = 1/ (1 + Kp*TSS* 10^-6)					TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)										
67	Total Metal Criteria (Ct) = Cr / (C/Ct)					C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value										
68																
69				***Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert t**							**Lake Linear Partition Coefficient**					
70	Total Metals	Dissolved Value in Stream		Kpo	alpha (a)	Kp	C/Ct	Total Value			Kpo	alpha (a)	Kp	C/Ct	Total Value	
71																
72	Arsenic			480000	-0.73	138285.446	0.56799788	0.00			480000.00	-0.73	138285.45	0.5679979	0	
73	Cadmium			4000000	-1.13	582706.889	0.237818469	0.00			3520000.00	-0.92	733514.98	0.1986361	0	
74	Chromium(3)			3360000	-0.93	688338.365	0.208948818	0.00			2170000.00	-0.27	1369499.28	0.1172024	0	
75	Copper			1040000	-0.74	294554.016	0.381672529	0.00			2850000.00	-0.9	614495.12	0.2283249	0	
76	Lead			2800000	-0.8	715925.58	0.202527926	0.00			2040000.00	-0.53	826490.64	0.1803199	0	
77	Mercury			2900000	-1.14	415321.613	0.30448177	0.00			1970000.00	-1.17	268066.09	0.4041443	0	
78	Nickel			490000	-0.57	185433.992	0.495077211	0.00			2210000.00	-0.76	604946.03	0.2310962	0	
79	Zinc			1250000	-0.7	379014.766	0.324193117	0.00			3340000.00	-0.68	1047851.74	0.1478593	0	
80	Silver			2400000	-1.03	414607.994	0.30484608	0.00			2400000.00	-1.03	414607.99	0.3048461	0	
81		*Note: Use this section to convert lab concentrations shown as "dissolved" to "total"														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
82											Dissolved	Total				
83	**The following formulas are used to calculate water quality criteria based on Regulation No. 2 (Act 472 of Ark 1949)**										WQC (ug/l)	WQC(ug/l)				
84	Cadmium			Acute			WER X CF1 X e(1.128[ln(hardness)]-3.828)				0.93		CF1 = 1.136672 - [0.041838*ln(hardness)]			
85				Chronic			WER X CF2 X e(0.7852[ln(hardness)]-3.490)				0.40		CF2 = 1.101672 - [0.041838*ln(hardness)]			
86																
87	Chromium Tri			Acute			WER X 0.316 X e(0.819[ln(hardness)]+3.688				193.46					
88				Chronic			WER X 0.86 X e(0.819[ln(hardness)]+1.561				62.76					
89																
90	Chromium Hex			Acute			WER X 0.982 X 16				15.71					
91				Chronic			WER X 11 X 0.962				10.58					
92																
93	Copper			Acute			WER X 0.96 X e(0.9422[ln(hardness)]-1.464)				5.13					
94				Chronic			WER X 0.96 X e(0.8545[ln(hardness)]-1.465)				3.82					
95																
96	Lead			Acute			WER X e(1.273[ln(hardness)]-1.460)*CF3				15.77		CF3 = 1.46203 - [0.145712*ln(hardness)]			
97				Chronic			WER X e(1.273[ln(hardness)]-4.705)*CF3				0.61					
98																
99	Mercury			Acute			WER X 0.85 X 2.4				2.04					
100				Chronic			WER X 0.012				0.01					
101																
102	Nickel			Acute			WER X 0.998 X e(0.8460[ln(hardness)]+3.3612)				482.14					
103				Chronic			WER X 0.997 X e(0.8460[ln(hardness)]+1.1645)				53.55					
104																
105	Zinc			Acute			WER X 0.978 X e(0.8473[ln(hardness)]+0.8604)				38.92					
106				Chronic			WER X 0.986 X e(0.8473[ln(hardness)]+0.7614)				35.54					
107																
108	Silver			Acute			WER X 0.85 X e(1.72[ln(hardness)]-6.52)				0.39					
109																
110	Cyanide			Acute			WER X 22.36				22.36					
111				Chronic			WER X 5.2				5.20					
112																
113	Arsenic			Acute			WER X 360				360.00					
114				Chronic			WER X 190				190.00					
115																
116	Beryllium			Acute			WER X 130				130.00					
117				Chronic			WER X 5.3				5.30					
118																
119	Selenium			Acute			WER X 20				20.00					
120				Chronic			WER X 5				5.00					
121																
122	The following formulas are applicable to the Jet Stream Model for lakes for calculating the Dilution Factor (DF):															
123			DF = ((2.8 * D * 3.1416^0.5) / X)			where DF is % of effluent at distance X, D is the diameter of the outfall pipe										
124				and X is aquatic life criteria--25 feet for ZID; 100 feet for mixing zone; human health criteria 200 feet for mixing zone.												
125			DF =	#VALUE!	Acute	#VALUE!	Chronic	#VALUE!	Bioacc.							
126																
127	The following formulas are used to calculate the instream waste concentration (IWC) for each pollutant:															
128																
129			IWC = [(Frac X Critical Flow X Cb) + (2.13 X Ce X Qd)] / [Frac X Critical Flow + Qd] where the critical flow is the 7Q10 except for lakes with the Jet Stream Model.													
130			Use EPA Statistical Factor of 2.13 for less than 20 Ce data points with the Geometric Mean of the Ce's; use 1 for more than 20 data points with the maximum Ce.													
131			IWC = (DF X Ce) + Cb for lakes with Jet Stream Model.													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
132	POLLUTANTS		Number of Data points	MQL	EPA Statistical	Background Conc. Cb	Effluent Conc. Ce	Domestic Supply IWC	Acute Aquatic IWC	Chronic Aquatic IWC	Bioacc. IWC	Domestic Criteria	Arkansas Acute Aquatic Criteria	Arkansas Chronic Aquatic	Arkansas Bioacc.	
133				ug/l	Factor	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
137	**METALS AND CYANIDE**															
138	1. Antimony Total		1	60	2.13	0	0	0.00	0.00	0.00	0.00	########	9000.00	1600.00	4300	
139	2. Arsenic Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	50	633.81	334.51	1.4	
140	3. Beryllium Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	########	130.00	5.30	4	
141	4. Cadmium Total		1	1	2.13	0	1.17	0.16	1.32	0.53	0.05	10	3.91	1.69	#########	
142	6. Chromium (Tri)		1	10	2.13	0	5.66	0.76	6.38	2.56	0.27	50	925.86	300.34	#########	
143	7. Chromium (hex)		1	10	2.13	0	5.66	0.76	6.38	2.56	0.27	50	15.71	10.58	#########	
144	8. Copper Total		1	0.5	2.13	0	11.7	1.58	13.19	5.30	0.55	########	13.44	10.02	#########	
145	9. Lead Total		1	0.5	2.13	0	3.13	0.42	3.53	1.42	0.15	50	77.87	3.03	#########	
146	10. Mercury Total		1	0.005	2.13	0	0.009	0.00	0.01	0.00	0.00	2	6.70	0.012	0.15	
147	12. Nickel Total		1	0.5	2.13	0	7.87	1.06	8.87	3.56	0.37	########	973.88	108.16	4600	
148	13. Selenium Total		1	5	2.13	0	11.3	1.52	12.74	5.11	0.53	10	20.00	5.00	#########	
149	14. Silver Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	50	1.27	#########	#########	
150	15. Thallium Total		1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	########	1400.00	#########	6.3	
151	16. Zinc Total		1	20	2.13	0	251	33.79	282.97	113.62	11.76	#########	120.05	109.63	#########	
152	129. Phenols, Total		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
153	17. Cyanide Total		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	22.36	5.2	220000	
156	**DIOXIN**															
157	18. 2-3-7-8-TCDD		1	0.00001	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.01	1.00E+07	1.00E-06	
159	**VOLATILE COMPOUNDS**															
160	19. Acrolein		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	68	21	780	
161	20. Acrylonitrile		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	7550	2600	6.6	
162	21. Benzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	5300	9999999	710	
163	22. Bromoform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	########	9999999	#########	3600	
164	23. Carbon Tetrach		1	2	2.13	0	0	0.00	0.00	0.00	0.00	5	35200	#########	44	
165	24. Chlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	250	50	2.10E+04	
166	25. Chlorodibromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	340	
167	26. Chloroethane		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
168	27. 2-Chloroethylvinyl ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	1.00E+07	
169	28. Chloroform		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	28900	1240	4700	
170	29. Dichlorobromomethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999	#########	220	
171	30. 1-1-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	7	9999999.00	#########	#########	
172	31. 1-2-Dichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	11800	20000	990	
173	32. 1-1-Dichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	11600	#########	32	
174	33. 1,2 Dichloropropane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	23000	5700	#########	
175	34. 1,3 Dichloropropylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	6060	244	1700	
176	35. Ethylbenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	32000	#########	29000	
177	37. Methyl Chloride		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
178	36. Methyl bromide		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	4000	
179	38. Methylene chloride		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	16000	
180	39. 1-1-2-2-Tetrachloroetha		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9320	2400	110	
181	40. Tetrachloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	5280	840	88.5	
182	41. Toluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	17500	#########	2.00E+05	
183	42. 1,2-trans-dichloroethyler		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
184	44. 1-1-2-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	18000	9400	420	
185	43. 1-1-1-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	200	18000	#########	#########	
186	45. Trichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	5	45000	21900	810	
187	46. Vinyl Chloride		1	10	2.13	0	0	0.00	0.00	0.00	0.00	2	9999999.00	#########	5250	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
189	**ACID COMPOUNDS**												9999999.00	#########	#########	
190	47. 2-Chlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	4380	#########	#########	
191	48. 2-4-Dichlorphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	2020	365	#########	
192	49. 2-4 Dimethylphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
193	50. 4,6-Dinitro-o-Cresol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	765	
194	51. 2,4-Dinitrophenol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14000	
195	52.-53. Nitrophenols		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	230	150	#########	
196	54. 4 Chloro-3-methylpheno		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	30	#########	#########	
197	55. Pentachlorophenol		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9.16	5.78	82	
198	56. Phenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	10200	2560	4600000	
199	57. 2-4-6-Trichlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	65	
201						Ambient Background Conc.	Effluent Conc.	Domestic Supply	Acute Aquatic	Chronic Aquatic	Human Health	Domestic Criteria	Acute Aquatic Criteria	Chronic Aquatic Criteria	Human Health Criteria	
202	**BASE/NEUTRAL COMPOUNDS**				2.13	Cb	Ce	IWC	IWC	IWC	IWC	ug/l	ug/l	ug/l	ug/l	
203	58. Acenaphthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1700	520	#########	
204	59. Acenapthylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
205	60. Anthracene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	110000	
206	61. Benzidine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	2500	#########	5.40E-03	
207	62. Benzo(a) anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
208	63. Benzo(a) pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
209	64. 3,4-benzoflouranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
210	65. Benzo(g,h,i)perylene		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
211	66. Benzo(k) fluoranthene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
212	67. Bis(2-chloroethoxy)meth		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
213	68. Bis(2-chloroethly) Ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14	
214	69. Bis(2-Chloroisopropyl) e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.70E+05	
215	70. Bis(2-ethylhexyl)phthala		1	10	2.13	0	2.87	0.39	3.24	1.30	0.13	#########	9999999.00	#########	59	
216	71. 4-Bromophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
217	72. Butylbenzy phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
218	73. 2-chloronapthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1600	#########	#########	
219	74. 4-chlorophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
220	75. Chrysene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
221	76. Dibenzo(a,h)anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
222	77-79. Dichlorobenzene(1,2		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	1120	763	2600	
223	80. 3,3' Dichlorobenzidine		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.77	
224	81. Diethyl Phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.20E+05	
225	82. Dimethyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	2.90E+06	
226	83. Di-n-Butyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	1.20E+04	
227	84. 2-4-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	330	230	91	
228	85. 2-6-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
229	86. Di-n-octyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
230	87. 1,2-diphenylhydrazine		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	270	#########	5.4	
231	88. Fluoranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	3980	#########	370	
232	89. Fluorene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	14000	
233	90. Hexachlorobenzene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.0077	
234	91. Hexachlorobutadiene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	90	9.3	500	
235	92. Hexachlorocyclopentadi		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	7	5.2	1.74E+04	
236	93. Hexachloroethane		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	980	540	89	
237	Hexachlorocyclohexane		1		2.13	0	0	0.00	0.00	0.00	0.00	#########	2	0.08	#########	
238	94. Indeno(1,2,3-cd)pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	0.31	
239	95. Isophorone		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	117000	#########	6000	
240	96. Naphthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	2300	620	#########	
241	97. Nitrobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	27000	#########	1900	
242	98. N-nitrosodimethylamine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	81	
243	99. N-nitrosodi-n-propylamir		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
244	100. N-nitrosodiphenylamin		1	20	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	160	
245	101. Phenanthrene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
246	103. 1,2,4-trichlorobenzene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	#########	#########	
247																
248	**PESTICIDES**															
249	104. Aldrin		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	3.00	#########	0.0014	
250	105. Alpha-BHC		1	0.05	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.00	0.08	0.0373	
251	106. Beta-BHC		1	0.05	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.00	0.08	0.46	
252	107. Gamma-BHC		1	0.05	2.13	0	0.0969	0.01	0.11	0.04	0.00	#########	2.00	0.08	0.63	
253	108. Delta-BHC		1	0.05	2.13	0	0.0407	0.01	0.05	0.02	0.00	#########	2.00	0.08	#########	
254	109. Chlordane		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	2.40	0.0043	0.005	
255	110. 4,4'-DDT		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	1.10	0.001	0.0059	
256	111. 4,4'-DDE		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	1.10	0.001	0.0059	
257	112. 4,4'-DDD		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	1.10	0.001	0.0084	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
258	113. Dieldrin		1	0.02	2.13	0	0.113	0.02	0.13	0.05	0.01	#########	2.50	0.0019	0.0012	
259	114. Alpha-endosulfan		1	0.01	2.13	0	0.0211	0.00	0.02	0.01	0.00	#########	0.22	0.056	2	
260	115. Beta-endosulfan		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
261	116. Endosulfan sulfate		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.22	0.056	2	
262	117. Endrin		1	0.02	2.13	0	0	0.00	0.00	0.00	0.00	0.2	0.18	0.0023	0.81	
263	118. Endrin aldehyde		1	0.1	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.18	0.0023	0.81	
264	119. Heptachlor		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.0021	
265	120. Heptachlor epoxide		1	0.01	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.52	0.0038	0.0011	
266	121. PCB-1242		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
267	122. PCB-1254		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
268	123. PCB-1221		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
269	124. PCB-1232		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
270	125. PCB-1248		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
271	126. PCB-1260		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
272	127. PCB-1016		1	0.2	2.13	0	0	0.00	0.00	0.00	0.00	#########	9999999.00	0.014	0.0004	
273	128. Toxaphene		1	0.3	2.13	0	0	0.00	0.00	0.00	0.00	5	0.73	0.0002	0.00045	
274	130. Chlorpyrifos		1	0.07	2.13	0	0	0.00	0.00	0.00	0.00	#########	0.08	0.041	#########	
275																
276																
277																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
278																
279	STEP 3:	APPLICABLE WATER QUALITY-BASED LIMITS														
280																
281																
282																
283	POLLUTANTS		Permit Daily Maximum	Permit Monthly Average	Permit Daily Maximum	Permit Monthly Average		EPA Bioac Status								
284			ug/l	ug/l	lb/day	lb/day										
285	Dieldrin		0.02	0.01	0.01	0.00		N/A								
286	Selenium Total		52.68	26.26	23.02	11.47		N/A								
287	Zinc Total		402.09	200.40	175.72	87.58		N/A								