



ARKANSAS
Department of Environmental Quality

**RESPONSE TO COMMENTS
FINAL PERMIT DECISION**

This is our response to comments received on the subject draft permit in accordance with regulations promulgated at 40 CFR Part 124.17.

Permit No. : AR0045977
Applicant : Nucor Steel – Arkansas Division of Nucor Corporation
Prepared by : Parviz Mokhtari
Permit Action : Final permit decision and response to comments received on the draft permit publicly noticed on February 11, 2005, March 14, 2005 and April 15, 2005.
Date Prepared : August 1, 2005

The following comments have been received on the draft permit.

Letter from Mr. Vince Blubaugh, GBM^c, on the behalf of the Permittee to Mr. Martin Maner, dated March 14, 2005.

Letter from Mr. Wayne D. Turney, to Mr. Mo Shafii, dated April 15, 2005.

E-mail from Mr. Wayne D. Turner, to Mr. Parviz Mokhtari, dated May 24, 2005.

E-mail from Mr. James Yankee, to Mr. Parviz Mokhtari, dated February 15, 2005.

Note: The Department held a meeting on March 23, 2005 with the permittee to discuss the technical issues in detail. The permittee agreed to submit additional information in regard to production and long term average flow and other necessary information for Outfall 001.

Issue # 1:

Both GBM^c, in the letter dated March 14, 2005, and the permittee in the letter dated April 15, 2005, stated that the Nucor production rates have been increased. The permittee requested that the following production rates which are the highest monthly production rate over the last 12 months should be used in the calculation of effluent guideline limitations.

Hot Mill	Highest Month (Tons Tapped)
Continuous Casting	266,248
Hot Forming Mill	266,248
Cold Mill	Highest Month (Tons Tapped)
Pickle Line	98,151
Reversing Mill	89,847
Temper Mill	20,662
Galvanize Line	56,532

Response # 1:

Staff agrees. The production data submitted by Nucor has been used in the calculation of effluent guideline limitations (See Page 9 of Fact Sheet).

Issue # 2:

The permittee requested that all mass based Oil and Grease limits for Outfall 001 be technology based in accordance with the effluent guidelines. The derivation of mass limits for Oil and Grease from the concentration limits of Reg. 2.510 is not appropriate. Those concentration limitations represent end of pipe effluent limits mandated by Reg. 2 and not protective instream criteria to be maintained after mixing. As such, only daily maximum Oil and Grease mass limitations are appropriate as there are no monthly average limitations under the effluent guidelines.

Response # 2:

Staff partially agrees. The mass limitations for Oil & Grease for Outfall 001 have been changed to technology based limitations based on 40 CFR 420 Subparts F, G, I, J, K, and L. Additionally, in absence of the monthly average $\frac{1}{2}$ of the maximum daily multiplier has been used to calculate the monthly average mass limit. Oil & Grease limits must be included in the permit based on Regulation No. 2 and 40 CFR 122.44 (l).

Issue # 3:

The permittee requested the deletion of the TSS concentration limitations for Outfall 001. The appropriate limitations for TSS are the mass limits from the effluent guidelines. There are no instream protective criteria for TSS adopted as water quality standards by the ADEQ and therefore the production based mass effluent limitations should be utilized.

Response # 3:

Staff partially agrees. The TSS concentration limits of 30 mg/l (monthly average) and 45 mg/l (daily max) at outfall 001 are continued from the previous permit based on the 40 CFR 122.44 (l). Staff agrees that there is no water quality criteria for TSS, but there is water quality criteria for turbidity based on Section 2.503 of Regulation No. 2. The turbidity limit in lieu of the TSS limit was discussed with the permittee in the meeting March 23, 2005. ADEQ suggested that the permittee has the option to replace the TSS limit with the turbidity limit. Therefore, if the permittee decides to remove the TSS concentration limit and replace them with a turbidity limit, this request may be granted without a major modification of the permit. The technology based mass limits for TSS have been included in the permit based on 40 CFR 420, Subparts F, G, I, J, K, and L.

Issue # 4:

The permittee requested that all flows used in the derivation of concentration limitations from technology based mass limitations should be derived using long term average flows, not the highest monthly average flow for the previous two years as that represents the default value to derive water quality based limitations and is not associated with effluent guideline limitations.

Response # 4:

Staff agrees. In the meeting held March 23, 2005, the flow for Outfall 001 was discussed and all present agreed to use the long term average flow for Outfall 001. Item # 3 of the permittee's letter dated April 15, 2005, stated that the long term average flow for outfall 001 is 0.446 MGD.

Issue # 5:

The permittee stated that the derivation of concentration limitations for parameters (from effluent guideline mass limitations) for which there are no water quality criteria adopted by ADEQ (e.g., total chromium and naphthalene) is not appropriate. For those parameters, only the effluent guideline mass limitations should be utilized in the permit. We request the removal of such derived limitations in the final permit.

Response # 5:

Staff partially agrees. The concentration limits for chromium (total recoverable) have been changed to monitoring and reporting requirements based on 40 CFR 122.45 (f)(2) "pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations." Additionally, the rationale for including the monitoring and reporting requirement for concentration is to ensure proper operation of the treatment facility at all times. Changing the concentration limits to monitoring and reporting for total recoverable chromium does not violate the antibacksliding provision based on 40 CFR 122.44(a)(2)(i)B(2). In addition, the naphthalene limitations have been removed based on 40 CFR 122.44(a)(2)(i), (See Issue # 12). Removing the limitations for naphthalene does not violate the antibacksliding provision based on 40 CFR 122.44(l)(2)(i)B(1).

Issue # 6:

The permittee has requested that quarterly biomonitoring frequency be maintained in the renewed permit.

Response # 6:

Staff agrees. The Whole Effluent Toxicity (WET) testing frequency of quarterly monitoring is continued from the previous permit for both *Ceriodaphnia dubia* and *Pimephales promelas*. The Continuing Planning Process (CPP), Appendix D, E.,2.,b. states, "*If the permittee has a history of sporadic toxicity, toxicity testing frequency shall be twelve times a year for both species.*" During the previous permit cycle Nucor Steel reported lethal and sub-lethal effects in both test organisms. However, the permittee has submitted a plan to characterize effluent in the event lethality is observed in WET test results and a reduction in monitoring would provide resources which can be used for effluent characterizations in the future.

Issue # 7:

Based on the record, it is Nucor's contention that the fathead minnow testing completed during the previous permit cycle has demonstrated that there is no likely potential for biomonitoring failure regarding the fathead minnow. The fathead minnow biomonitoring has been completed without any test failure, either the lethality or sub-lethality (i.e., growth) period for the last four years. This history of no demonstrated effect should limit the required biomonitoring for the fathead minnow. Therefore, Nucor requests that the frequency of biomonitoring for the fathead minnow be eliminated or reduced to a minimum of once per year.

Response # 7:

Staff does not agree. The State of Arkansas is currently implementing EPA's Post Third-Round Policy in conformance with the EPA Regional strategy. The EPA Region 6, Post-Third Round Whole Effluent Toxicity Testing Frequencies states, "All major dischargers, and those minor dischargers specifically identified by EPA or the State permitting authority as posing a significant unaddressed toxic risk, will be required to perform Whole Effluent Toxicity (WET) testing at a frequency of once per quarter for the vertebrate and invertebrate tests species for the first year of a new or reissued permit."

The testing frequency for *Pimephales promelas* shall be quarterly and a reduction may be requested after the permittee passes four consecutive tests.

Issue # 8:

The permittee stated the critical dilution for the seasonal condition has been increased from 93.8% to 100% without any justification. Please provide the rationale for this modification.”

Response # 8:

The justification for the increase of the critical dilution from 93.8% to 100 % was explained in Section 12.F of the Fact Sheet. The critical dilution of 93.8% was calculated based on the highest monthly average flow of the last two years (0.966 MGD = 1.49 cfs) and this critical dilution is not applicable anymore based on the new flow. The flow of 0.446 MGD = 0.69 cfs has been used in the following calculations of the critical dilutions:

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

December through May:

$Q_d = \text{Average flow} = 0.446 \text{ MGD} = 0.69 \text{ cfs}$

$\text{Critical Flow} = 1 \text{ cfs} - \text{Average flow} = 1 \text{ cfs} - 0.69 \text{ cfs} = 0.31 \text{ cfs}$

$Q_b = \text{Background flow} = (0.67) \times 7Q_{10} = 0.67 \times 0.31 = 0.21$

$CD = (0.69) / (0.69 + 0.21) \times 100 = 77 \%$

June through November:

$7Q_{10} = 0 \text{ cfs}$

$Q_b = \text{Background flow} = (0.67) \times 7Q_{10} = 0 \text{ cfs}$

$CD = (0.69) / (0.69 + 0) \times 100 = 100\%$

Issue # 9:

Section Part II.B.1.b. of the permit provides that the “permittee shall provide an adequate operating staff which is duly qualified to carryout operation, maintenance and testing functions required to insure compliance with the conditions of this permit.” Through this comment we are seeking clarification that by the term “provide” the permit only requires Nucor to utilize the services of adequate laboratories when samples are tested for constituent levels and/or biomonitoring testing. Nucor should not be required to actually employ staff qualified to conduct the sample testing itself (e.g., the laboratory and biomonitoring protocols).

Response # 9:

This issue was clarified with the permittee in the meeting held on March 23, 2005. Therefore, Nucor can utilize the services of the outside laboratory facilities for sampling.

Issue # 10:

The permittee requested that the draft permit contains proposed discharge limitations for hexavalent chromium based on guidelines in 40 C.F.R. 420 Subpart L (Galvanizing Operations). ADEQ asserts that the failure to include hexavalent chromium limitations in prior NPDES permits is due to a “mistake.”

40 C.F.R. 420, Subpart L states:

The limitations for hexavalent chromium shall apply only to galvanizing operations which discharge wastewaters from the chromate rinse step.

Nucor does not discharge wastewater from its chromate rinse step operations. All waste from this operation, including overspray and “off-spec” chromate are manifested as hazardous waste under RCRA and shipped off site for disposal. Consequently, the proposed discharge limitations and associated sampling, monitoring and reporting requirements for hexavalent chromium should be removed.

Response # 10:

Staff agrees. 40 CFR 420, Subpart L (galvanizing operations) establishes the effluent limitations for hexavalent chromium. According to the guideline, effluent limits are applicable only to galvanizing operations which discharge wastewater from the chromate rinse step. Nucor Steel has certified by the letters dated October 26, 2004 and March 14, 2005, that wastewater from the chromate rinse cycle is not discharged to the surface. Therefore the hexavalent chromium limitations have been removed.

Issue # 11:

The permittee stated that the draft permit contains some concentration limits derived from mass technology based limitations (e.g., zinc) which are more stringent than water quality based concentration limitations developed under ADEQ permitting processes. The imposition of such derived concentration limits is inappropriate and we request that such limitations be removed.

Response # 11:

Staff disagree. The rationale for including concentration limitations is to ensure proper operation of the treatment facility at all times. Section 12.A of the Fact Sheet explains that the permit limits are based on either technology-based effluent limits pursuant to 40 CFR Part 122.44 (a) or on State water quality standards and requirements pursuant to 40 CFR Part 122.44 (d), whichever are more stringent. Additionally, 40 CFR 122.45 (f)(2) states that “pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.”

Issue # 12:

The permittee stated that the proposed effluent limitations for naphthalene and tetrachloroethylene should be removed; alternatively, the sampling and reporting requirements for these parameters should be eliminated. Naphthalene and tetrachloroethylene are based on effluent guidelines for cold forming (40 C.F.R. Part 420, Subpart J) that are not representative of the Nucor facility. Nucor has not, does not, and does not intend in the future to use naphthalene and tetrachloroethylene at its facility. Consequently, these parameters have never been detected in Nucor’s discharge. Since ADEQ now has a database demonstrating that these parameters are not present in Nucor’s discharge, these discharge limits and/or the sampling and monitoring requirements for these parameters should be eliminated.

Response # 12:

Staff agrees. The review of the DMRs data for Naphthalene and tetrachloroethylene for the last five years indicates “non-detect” for these parameters. The permittee, in the letter dated March 14, 2005, certified that they have not, do not, and do not intend in the future to use Naphthalene and tetrachloroethylene at this facility. Therefore, naphthalene and tetrachloroethylene limitations have been removed for the term of the permit (5 years) based on 40 CFR 122.44 (a)(2). Additionally, in regards to this certification, Condition No. 5 of Part III has been added to the permit. Removing the limitations for naphthalene and tetrachloroethylene does not violate the antibacksliding provision based on 40 CFR 122(1)(2)(i)B(1).

Issue # 13:

The draft permit contains water quality based discharge limits for oil and grease, lead and temperature. 40 CFR 122.4(d) permits water quality based discharge limits only when a discharge “has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard.” 40 CFR 122.44 also requires ADEQ to evaluate several factors in determining whether a discharge “causes, has the reasonable potential to cause, or contributes to an in-stream excursion”. The Fact Sheet issued with the draft permit does not adequately explain how ADEQ evaluated all the factors listed in 40 CFR 122.4(d)(1)(ii) in determining that water quality based discharge limits were necessary to achieve water quality standards.

Furthermore, ADEQ has not demonstrated that Nucor’s discharge causes or is likely to cause pollution as defined in Ark. Code Ann section 8-4-102; consequently, ADEQ is without authority to impose water quality based discharge limits.

Response # 13:

Staff disagrees.

Oil and Grease (O&G)

Oil and Grease mass limitations were calculated based on 40 CFR 420 Subparts F, G, I, J, K, L and the facility production data. In accordance with 40 CFR 122.45(f)(2) “pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.” In addition, the rationale for including concentration limitations is to ensure proper operation of the treatment facility at all times. Section 12.A of the Fact Sheet explains that the permit limits are based on either technology-based effluent limits pursuant to 40 CFR Part 122.44 (a) or on State water quality standards and requirements pursuant to 40 CFR Part 122.44 (d), whichever are more stringent. Also, the previous permit contains both mass and concentration limits for O&G based on 40 CFR 122.44 (d) and Section 2.510 of Regulation No.2.

Lead, Total Recoverable

Lead mass limitations were calculated based on 40 CFR 420 Subparts F, I, J, L and the facility production data. In accordance with 40 CFR 122.45(f)(2) “pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.” In addition, the rationale for including concentration limitations is to ensure proper operation of the treatment facility at all times. Section 12.A of the Fact Sheet explains that the permit limits are based on either technology-based effluent limits pursuant to 40 CFR Part 122.44 (a) or on State water quality standards and requirements pursuant to 40 CFR Part 122.44 (d) whichever are more stringent. Also, the previous permit contains both mass and concentration limits for lead, based on State water quality standards and 40 CFR 122.44 (d). However, the review of the DMRs data for lead for the last five years indicates “non-detect”. Therefore, the monitoring frequency for this parameter has been reduced from once per week to once per month based on the compliance history of the last 5 years and the engineering judgment of the permit writer.

Temperature

The temperature limit is continued from the previous permit based on Section 2.502 of Regulation No. 2 and 40 CFR 122.44 (l). The review of the DMRs for the last 5 years indicates that the facility has exceeded the permit limit for temperature. The high temperature of 93.8 °F was reported in July 2000. Therefore, the Department cannot remove the temperature limit at this time. The permittee believes that the cause of the high temperatures are due to an ambient temperature regime. This issue was discussed in the meeting held March

23, 2005, and ADEQ agreed that Nucor may conduct a study in regard to the source of temperature. The Department has added a condition (See Issue # 14 and Page 12 of Part III) to the permit which allows the permittee to evaluate the source of temperature. Please note that deleting a parameter may require a major modification of the permit.

Issue # 14:

The permittee stated that they do not have any temperature data on incoming sources to the wastewater treatment system and therefore request that the permit allow for the development of such information prior to the imposition of temperature limits at Outfall 001.

Response # 14:

Staff partially agrees. The temperature limitation for Outfall 001 is continued from the previous permit based on 40 CFR 122.44 (l). However, the permit may be modified to remove the temperature limitation if an evaluation of the documents show that the elevation of water temperatures in the pond are related to ambient sources of heat under summer time conditions (See Condition No. 6 of Part III and Page 1 of Part IB).

Issue # 15:

Mr. James L. Yankee, Pretreatment Coordinator for the City of Blytheville, and Ms. Myra Taylor, Pretreatment Coordinator for the City of Jonesboro, stated that their facilities do not accept sludge from Nucor Steel as stated in the draft permit "Sludge produced by sanitary activities is delivered monthly to the Jonesboro or Blytheville POTW".

Response # 15:

In an e-mail dated May 9, 2005, Mr. Turney stated that Nucor plans to obtain a separate land application permit for sanitary sludge from the State Permit Branch. Additionally, the permittee has stated that the sludge produced by sanitary activities will be transferred to holding tanks on site until the land application permit has been issued; then the sludge will be land applied. Therefore, the above sludge language has been removed.

RESPONSE TO COMMENTS

PERMIT NAME	Nucor Steel – Arkansas Division of Nucor Corporation		
PERMIT NUMBER	AR0045977		
	DATE DUE	INITIALS	DATE INITIALED
REVIEWING ENGINEER (Parviz)			
MO SHAFII PERMITS SECTION CHIEF			
MARTIN MANER, P.E. CHIEF, WATER DIVISION			
LIST PEOPLE WHO SUBMITTED COMMENTS*	<ul style="list-style-type: none"> • Permittee and Permittee’s Consultant (GBMc) • Mr. James L. Yankee, Pretreatment coordinator for Blytheville Wastewater WWTP 		
FILE NAME	AR0045977		

* **SEND COPIES OF FINAL PERMIT AND RESPONSE TO COMMENTS TO ALL PEOPLE WHO SUBMITTED COMMENTS**

ARE THERE ANY CHANGES IN THE FINAL PERMIT?

YES _____ NO _____

CALL EPA (IF DRAFT PERMIT HAD BEEN SENT TO EPA AND MAJOR CHANGES ARE PROPOSED IN FINAL PERMIT)

YES _____ NO _____

REMARKS: _____

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

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

Nucor Steel - Arkansas, Division of Nucor Corporation
P. O. Box 30
Armored, AR 72310

is authorized to discharge from a facility located at twelve miles east of the City of Blytheville, on 7301 East County Road 142, just off of Hwy 137, in Sections 5 and 8, Township 15 North, Range 13 East in Mississippi County, Arkansas.

Latitude: 35° 56' 40"; Longitude: 89° 43' 00"

to receiving waters named:

an unnamed ditch, thence to Ditch No. 38, thence to Crooked Lake Bayou, thence to Pemiscot Bayou (Ditch No. 29), thence to the Little St. Francis River, thence to the St. Francis River in segment 5C of the St. Francis River Basin.

The outfalls are located at the following coordinates:

Outfall 001: Latitude: 35° 56' 12"; Longitude: 89° 43' 13"

Outfall 002: Latitude: 35° 56' 16"; Longitude: 89° 43' 02"

Outfall 003: Latitude: 35° 56' 31"; Longitude: 89° 42' 56"

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

This permit shall become effective on September 1, 2005.

This permit and the authorization to discharge shall expire at midnight, August 31, 2010.

Signed this 31st day of July, 2005.

Martin Maner, P.E.
Chief, Water Division
Arkansas Department of Environmental Quality

**PART I
PERMIT REQUIREMENTS**

SECTION A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 001-treated process wastewater (June – November)

During the period beginning on effective date and lasting until date of expiration, the permittee is authorized to discharge from outfall serial number 001 - treated process wastewater. Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow ¹ (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Total Suspended Solids (TSS)	452	1171	30	45	once/week	24-hr Composite
Oil and Grease (O & G)	154	364	10	15	once/week	grab
Lead, Total recoverable ²	1.42	3.28	11.7 (µg/l)	23.6 (µg/l)	once/month	24-hr Composite
Zinc, Total recoverable ²	1.53	4.61	283.3 (µg/l)	568.4 (µg/l)	once/week	24-hr Composite
Nickel, Total recoverable ²	0.038	0.113	10 (µg/l)	30 (µg/l)	once/week	24-hr Composite
Chromium, Total recoverable ²	0.050	0.125	Report (µg/l)	Report (µg/l)	once/week	24-hr Composite
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab
Temperature (Inst. Max)	N/A	N/A	N/A	89.6 °F	once/day	Instantaneous
Chronic Biomonitoring ³	N/A	N/A	N/A	N/A	once/quarter	24-hr composite
<u>Pimephales promelas (Chronic)</u>³ Pass/Fail Lethality (7-day NOEC) TLP6C Pass/Fail Growth (7-day NOEC)TGP6C Survival (7-day NOEC) TOP6C Coefficient of Variation TQP6C Growth (7-day NOEC) TPP6C			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %		once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite
<u>Ceriodaphnia dubia (Chronic)</u>³ Pass/Fail Lethality (7-day NOEC) TLP3B Pass/Fail Reproduction (7-day NOEC)TGP3B Survival (7-day NOEC) TOP3B Coefficient of Variation TQP3B Reproduction (7-day NOEC) TPP3B			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %		once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite

1 Report monthly average and daily maximum as MGD.
2 See Condition No. 4 of Part III (EPA Test Method and MQL).
3 See Condition No. 3 of Part III (Biomonitoring Requirements).

There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).
Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit.

**PART I
PERMIT REQUIREMENTS**

SECTION A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 001-treated process wastewater (December – May)

During the period beginning on effective date and lasting until date of expiration, the permittee is authorized to discharge from outfall serial number 001 - treated process wastewater. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow ¹ (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Total Suspended Solids (TSS)	452	1171	30	45	once/week	24-hr Composite
Oil and Grease (O & G)	154	364	10	15	once/week	grab
Lead, Total recoverable ²	1.42	3.28	15.3 (µg/l)	30.7 (µg/l)	once/month	24-hr Composite
Zinc, Total recoverable ²	1.53	4.61	325.3 (µg/l)	652.8 (µg/l)	once/week	24-hr Composite
Nickel, Total recoverable ²	0.038	0.113	10 (µg/l)	30 (µg/l)	once/week	24-hr Composite
Chromium, Total recoverable ²	0.050	0.125	Report (µg/l)	Report (µg/l)	once/week	24-hr Composite
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab
Temperature (Inst. Max)	N/A	N/A	N/A	89.6 °F	once/day	Instantaneous
Chronic Biomonitoring ³	N/A	N/A	N/A	N/A	once/quarter	24-hr composite
<u>Pimephales promelas (Chronic)</u>³ Pass/Fail Lethality (7-day NOEC) TLP6C Pass/Fail Growth (7-day NOEC)TGP6C Survival (7-day NOEC) TOP6C Coefficient of Variation TQP6C Growth (7-day NOEC) TPP6C			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %		once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite
<u>Ceriodaphnia dubia (Chronic)</u>³ Pass/Fail Lethality (7-day NOEC) TLP3B Pass/Fail Reproduction (7-day NOEC)TGP3B Survival (7-day NOEC) TOP3B Coefficient of Variation TQP3B Reproduction (7-day NOEC) TPP3B			<u>7-Day Average</u> Report (Pass=0/Fail=1) Report (Pass=0/Fail=1) Report % Report % Report %		once/quarter once/quarter once/quarter once/quarter once/quarter	24-hr composite 24-hr composite 24-hr composite 24-hr composite 24-hr composite

1 Report monthly average and daily maximum as MGD.
 2 See Condition No. 4 of Part III (EPA Test Method and MQL).
 3 See Condition No. 3 of Part III (Biomonitoring Requirements).

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit.

**PART I
PERMIT REQUIREMENTS**

SECTION A. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 002-treated sanitary wastewater

During the period beginning on effective date and lasting until three (3) years from the effective date, the permittee is authorized to discharge from outfall serial number 002 - treated sanitary wastewater. Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow ¹ (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Biochemical Oxygen Demand (BOD5)	7.6	11.3	30	45	once/month	24-hr Composite
Total Suspended Solids (TSS)	7.6	11.3	30	45	once/month	24-hr Composite
Ammonia Nitrogen (NH3-N)	Report	Report	Report	Report	once/month	24-hr Composite
Fecal Coliform Bacteria (FCB)			(colonies/100ml)			
	N/A	N/A	1000	2000	once/month	grab
Oil and Grease (O & G)	2.5	3.8	10	15	once/month	grab
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/month	grab

1 Report monthly average and daily maximum as MGD.

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit.

**PART I
PERMIT REQUIREMENTS**

SECTION A. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 002-treated sanitary wastewater

During the period beginning three (3) years from effective date and lasting until date of expiration, the permittee is authorized to discharge from outfall serial number 002 - treated sanitary wastewater. Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow ¹ (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5)						
(May-Oct)	3.8	5.6	15	22.5	once/month	24-hr Composite
(Nov-Apr)	5.0	7.5	20	30	once/month	24-hr Composite
Total Suspended Solids (TSS)	5.0	7.5	20	30	once/month	24-hr Composite
Ammonia Nitrogen (NH3-N)						
(May-Oct)	1.3	1.9	5	7.5	once/month	24-hr Composite
(Nov-Apr)	2.5	3.8	10	15	once/month	24-hr Composite
Fecal Coliform Bacteria (FCB)			(colonies/100ml)			
	N/A	N/A	1000	2000	once/month	grab
Oil and Grease (O & G)	2.5	3.8	10	15	once/month	grab
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/month	grab

1 Report monthly average and daily maximum as MGD.

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit.

**PART I
PERMIT REQUIREMENTS**

SECTION A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 003 –Non-contact cooling water

During the period beginning on effective date and lasting until date of expiration, the permittee is authorized to discharge from outfall serial number 003 - Non-contact cooling water . Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow ¹ (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Temperature (Inst. Max)	N/A	N/A	N/A	89.6 °F	once/week	Instantaneous
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab

1 Report monthly average and daily maximum as MGD.

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the Outfall 003.

SECTION B. SCHEDULE OF COMPLIANCE

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

Outfalls 001 and 003:

Compliance is required on the effective date of the permit.

Outfall 002:

Interim Limits :

Compliance with Interim limitations is required on the effective date of the permit.

Final Limits :

The permittee shall submit progress reports addressing the progress towards meeting the new water quality limits in accordance with the following schedule:

<u>ACTIVITY</u>	<u>DUE DATE AFTER EFFECTIVE DATE</u>
Progress Report	One (1) Year
Progress Report	Two (2) Years
Meet final limitations	Three (3) years

Compliance with final limits for CBOD5, TSS, and NH3-N is required three years from the effective date of the permit.

Outfall 001: Temperature

1. Within 90 days of permit issuance, the permittee shall submit a protocol for the evaluation of the temperature regime of the pond for the purpose of determining if the elevation of the temperatures in the pond are related to ambient sources of heat resulting from summer time conditions.
2. The evaluation shall be completed within 18 months of permit issuance.

PART II STANDARD CONDITIONS

SECTION A – GENERAL CONDITIONS

1. Duty to Comply

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

2. Penalties for Violations of Permit Conditions

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

3. Permit Actions

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

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

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

4. Toxic Pollutants

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

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

5. Civil and Criminal Liability

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

6. Oil and Hazardous Substance Liability

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

7. State Laws

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

8. Property Rights

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

9. Severability

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

10. Permit Fees

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

SECTION B – OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce not a Defense

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

3. Duty to Mitigate

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

4. **Bypass of Treatment Facilities**

a. **Bypass not exceeding limitation.**

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

b. **Notice**

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

c. **Prohibition of bypass**

- (1) Bypass is prohibited and the Director may take enforcement action against a permittee for bypass, unless:
 - (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal or preventive maintenance; and
 - (c) The permittee submitted notices as required by Part II.B.4.b.
- (2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Part II.B.4.c(1).

5. **Upset Conditions**

a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology base permit effluent limitations if the requirements of Part II.B.5.b of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. Conditions necessary for demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the specific cause(s) of the upset.
- (2) The permitted facility was at the time being properly operated.
- (3) The permittee submitted notice of the upset as required by Part II.D.6.: and
- (4) The permittee complied with any remedial measures required by Part II.B.3.

- c. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. **Removed Substances**

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

7. **Power Failure**

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

SECTION C: MONITORING AND RECORDS

1. **Representative Sampling**

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

2. **Flow Measurement**

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

3. **Monitoring Procedures**

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

of all required analytical results shall be maintained by the permittee or designated commercial laboratory. At a minimum, spikes and duplicate samples are to be analyzed on 10% of the samples.

4. **Penalties for Tampering**

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

5. **Reporting of Monitoring Results**

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

NPDES Enforcement Section
Water Division
Arkansas Department of Environmental Quality
8001 National Drive
P.O. Box 8913
Little Rock, AR 72219-8913

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

6. **Additional Monitoring by the Permittee**

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

7. **Retention of Records**

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample,

measurement, report or application. This period may be extended by request of the Director at any time.

8. **Record Contents**

Records and monitoring information shall include:

- a. The date, exact place, time and methods of sampling or measurements, and preservatives used, if any;
- b. The individuals(s) who performed the sampling or measurements;
- c. The date(s) analyses were formed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The measurements and results of such analyses.

9. **Inspection and Entry**

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

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

SECTION D – REPORTING REQUIREMENTS

1. **Planned Changes**

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

For Industrial Dischargers

- a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b).
- b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40CFR Part 122.42 (a)(1).

For POTW Dischargers:

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

2. **Anticipated Noncompliance**

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

3. **Transfers**

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

4. **Monitoring Reports**

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

5. **Compliance Schedule**

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

6. **Twenty-four Hour Report**

a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain the following information:

- (1) a description of the noncompliance and its cause;
- (2) the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

(3) steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance.

- b. The following shall be included as information which must be reported within 24 hours:
 - (1) Any unanticipated bypass which exceeds any effluent limitation in the permit;
 - (2) Any upset which exceeds any effluent limitation in the permit and
 - (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part III of the permit to be reported within 24 hours.
- c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

7. **Other Noncompliance**

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

8. **Changes in Discharge of Toxic Substances for Industrial Dischargers**

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

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

9. **Duty to Provide Information**

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

10. **Duty to reapply**

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

11. Signatory Requirements

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

a. All permit applications shall be signed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation: or

(ii) The manager of one or more manufacturing, production, or operation facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or proprietor, respectively;

or

(3) For a municipality, State, Federal, or other public agency; by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) The chief executive officer of the agency, or

(ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

b. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person.

A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above.

(2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(3) The written authorization is submitted to the Director.

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

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

12. **Availability of Reports**

Except for data determined to be confidential under 40 CFR Part 2 and Regulation 6, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Pollution and Ecology. As required by the Regulations, the name and address of any permit applicant or permittee, permit applications, permits and effluent data shall not be considered confidential.

13. **Penalties for Falsification of Reports**

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

**PART III
OTHER CONDITIONS**

1. The operator of this wastewater treatment facility shall be licensed by the State of Arkansas in accordance with Act 1103 of 1991, Act 556 of 1993, Act 211 of 1971, and Regulation No. 3, as amended.
2. In accordance with 40 CFR Part 122.62 (a) (2), the permit may be modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit issuance.
3. **WHOLE EFFLUENT TOXICITY TESTING (7-DAY CHRONIC NOEC FRESHWATER)**

1. **SCOPE AND METHODOLOGY**

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

APPLICABLE TO FINAL OUTFALL: **001**

CRITICAL DILUTION (%):

77 (December through May)

100 (June through November)

EFFLUENT DILUTION SERIES (%):

77, 58, 43, 32, and 24 (December through May)

100, 75, 56, 42, and 32 (June through November)

COMPOSITE SAMPLE TYPE: **Defined at PART I**

TEST SPECIES/METHODS: **40 CFR Part 136**

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA/600/4-91/002 or the most recent update thereof.

This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA/600/4-91/002, or the most recent update thereof. A minimum of five (5) replicates with eight (8)

organisms per replicate must be used in the control and in each effluent dilution of this test.

- b. The NOEC (No Observed Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.
- c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.
- d. Test failure is defined as a demonstration of statistically significant sub-lethal or lethal effects to a test species at or below the effluent critical dilution.

2. **PERSISTENT LETHALITY**The requirements of this subsection apply only when a toxicity test demonstrates significant lethal effects at or below the critical dilution. Significant lethal effects are herein defined as a statistically significant difference at the 95% confidence level between the survival of the appropriate test organism in a specified effluent dilution and the control (0% effluent).

a. Part I Testing Frequency Other Than Monthly

- i. The permittee shall conduct a total of two (2) additional tests for any species that demonstrates significant lethal effects at or below the critical dilution. The two additional tests shall be conducted monthly during the next two consecutive months. The permittee shall not substitute either of the two additional tests in lieu of routine toxicity testing. The full report shall be prepared for each test required by this section in accordance with procedures outlined in Item 4 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.
- ii. If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section. The permittee shall notify ADEQ in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first

failed retest. A TRE may be also be required due to a demonstration of persistent significant sub-lethal effects or intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

- iii. If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall henceforth increase the frequency of testing for this species to once per quarter for the life of the permit.
- iv. The provisions of Item 2.a are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution. A TRE may be also be required due to a demonstration of persistent significant sub-lethal effects or intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

3. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

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

- i. The toxicity test control (0% effluent) must have survival equal to or greater than 80%.
- ii. The mean number of Ceriodaphnia dubia neonates produced per surviving female in the control (0% effluent) must be 15 or more.
- iii. 60% of the surviving control females must produce three broods.
- iv. The mean dry weight of surviving fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.

- v. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the fathead minnow test.
- vi. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the fathead minnow test.

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

b. Statistical Interpretation

- i. For the Ceriodaphnia dubia survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/600/4-91/002 or the most recent update thereof.
- ii. For the Ceriodaphnia dubia reproduction test and the fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/600/4-91/002 or the most recent update thereof.
- iii. If the conditions of Test Acceptability are met in Item 3.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

- (A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and
- (B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

- (A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;
- (B) the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);
- (C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and
- (D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

- ii. The permittee shall collect second and third composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.
- iii. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 4 degrees Centigrade during collection, shipping, and/or storage.
- iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 4 of this section.
- v. MULTIPLE OUTFALLS: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in Item 1.a above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.
- vi. The permittee shall not allow the sample to be dechlorinated at the laboratory. At the time of sample collection the permittee shall measure the TRC of the effluent. The measured concentration of TRC for each sample shall be included in the lab report submitted by the permittee.

4. REPORTING

- a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/600/4-91/002, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART II.C.7 of this permit. The permittee shall submit full reports upon the specific request of the Department. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for review.
- b. A valid test for each species must be reported on the DMR during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the LOWEST survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for ADEQ review.
- c. The permittee shall submit the results of each valid toxicity test on DMR for that reporting period in accordance with PART II.D.4 of this permit, as follows below. Submit retest information clearly marked as such with the following DMR. Only results of valid tests are to be reported on the DMR.
 - i. Pimephales promelas (fathead minnow)
 - (A) If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TLP6C.
 - (B) If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TGP6C.
 - (C) Report the NOEC value for survival, Parameter No. TOP6C.

- (D) Report the NOEC value for growth, Parameter No. TPP6C.
- (E) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.

ii. Ceriodaphnia dubia

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

5. Monitoring Frequency Reduction

- a. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for one or both test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution without a major modification. If granted, the monitoring frequency for that test species may be reduced to not less than once per year for the less sensitive species (usually the fathead minnow) and not less than twice per year for the more sensitive test species (usually the Ceriodaphnia dubia).
- b. CERTIFICATION - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in item 3.a. above. In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub-lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the Department will issue a letter of confirmation of the monitoring frequency reduction.

A copy of the letter will be forwarded to the Permit Compliance System section to update the permit reporting requirements.

- c. SUB-LETHAL FAILURES - If sub-lethal effects are demonstrated to a test species, the permittee shall perform two retests for the affected species during the next two consecutive months. In addition, the permittee shall continue monitoring for that species until the effluent passes four consecutive quarters with no demonstration of significant sub-lethal effects for that species. At that time, the permittee may apply for a frequency reduction for that species. Monthly retesting is not required if the permittee is performing a TRE.
- d. SURVIVAL FAILURES - If any test fails the survival endpoint at any time during the life of this permit, the permittee shall perform two retests for the affected species during the next two consecutive months. The monitoring frequency for the affected test species shall then be increased to once per quarter until the permit is re-issued. Monthly retesting is not required if the permittee is performing a TRE.
- e. This monitoring frequency reduction applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.

6. TOXICITY REDUCTION EVALUATION (TRE)

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

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

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

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

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

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

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

Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will

normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

4. If any individual analytical test results is less than the minimum quantification level (MQL) listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring report (DMR) calculations and reporting requirements.

Pollutant	EPA Method	MQL (µg/l)
Chromium, Total Recoverable	200.7	10
Lead, Total Recoverable	239.2	5
Nickel, Total Recoverable	200.7	40
Zinc, Total Recoverable	200.7	20

The permittee may develop a matrix specific method detection limit (MDL) in accordance with Appendix B of 40 CFR Part 136. For any pollutant for which the permittee determines a site specific MDL, the permittee shall send to ADEQ, NPDES Permits Branch, a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that a site specific MDL was correctly calculated. A site specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

$$\text{MQL} = 3.3 \times \text{MDL}$$

5. The facility is not allowed to discharge Naphthalene and tetrachloroethylene for the term of the permit (5 years).
6. The permittee shall perform an evaluation of the temperature regime of the pond for the purpose of determining if an elevation of temperatures in the pond are related to ambient sources of heat resulting from summer time conditions. This permit may be modified to remove the temperature limitation for Outfall 001 if the evaluation documents show that the elevation of water temperatures in the pond are related to ambient sources of heat under summer time conditions.

PART IV DEFINITIONS

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

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

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

7. **Monthly average:** means the highest allowable average of “daily discharges” over a calendar month, calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month. For Fecal Coliform Bacteria (FCB) report the monthly average see 30-day average below.
8. **“Daily Maximum”** discharge limitation means the highest allowable “daily discharge” during the calendar month. The 7-day average for fecal coliform bacteria is the geometric mean of the values of all effluent samples collected during the calendar week in colonies/100 ml.

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

22. **“6-hour composite sample”** consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

23. **“3-hour composite sample”** consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

24. **“Treatment works”** means any devices and systems used in storage, treatment, recycling, and reclamation of municipal sewage and industrial wastes, of a liquid nature to implement section 201 of the Act, or necessary to recycle reuse water at the most economic cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities, and any works, including site acquisition of the land that will be an integral part of the treatment process or is used for ultimate disposal of residues resulting from such treatment.

25. **“Upset”** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. Any upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack or preventive maintenance, or carelessness of improper operations.

26. **“For Fecal Coliform Bacteria”**, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads. For Fecal Coliform Bacteria (FCB) report the monthly average as a 30-day geometric mean in colonies per 100 ml.

27. **“Dissolved oxygen limit”**, shall be defined as follows:

- a. When limited in the permit as a monthly minimum, shall mean the lowest acceptable monthly average value, determined by averaging all samples taken during the calendar month;
- b. When limited in the permit as an instantaneous minimum value, shall mean that no value measured during the reporting period may fall below the stated value.

28. **The term “MGD”** shall mean million gallons per day.

29. **The term “mg/l”** shall mean milligrams per liter or parts million (ppm).

30. **The term “µg/l”** shall mean micrograms per liter or parts per billion (ppb).

31. **The term “cfs”** shall mean cubic feet per second.

32. **The term “ppm”** shall mean part per million.

33. **The term “s.u.”** shall mean standard units.

34. Monitoring and Reporting:

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

MONTHLY:

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

QUARTERLY:

(1) is defined as a fixed calendar quarter or any part of the fixed calendar quarter for a non-seasonal effluent characteristic with a measurement frequency of once/quarter. Fixed calendar quarters are: January through March, April through June, July through September, and October through December; or

(2) is defined as a fixed three month period (or any part of the fixed three month period) of or dependent upon the seasons specified in the permit for a seasonal effluent characteristic with a monitoring requirement frequency of once/quarter that does not coincide with the fixed calendar quarter. Seasonal calendar quarters May through July, August through October, November through January, and February through April.

SEMI-ANNUAL:

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

ANNUAL or YEARLY:

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

Final Fact Sheet

For renewal of NPDES Permit Number AR0045977 to discharge to Waters of the State

1. PERMITTING AUTHORITY.

The issuing office is:

Arkansas Department of Environmental Quality
8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913

2. APPLICANT.

The applicant is:

Nucor Steel - Arkansas, Division of Nucor Corporation
P. O. Box 30
Armored, AR 72310

3. PREPARED BY.

The permit was prepared by:

Parviz Mokhtari
NPDES Branch, Water Division

4. DATE PREPARED.

The permit was prepared on July 18, 2005.

5. PREVIOUS PERMIT ACTIVITY.

Effective Date: September 1, 1999
Modification Date: November 1, 2000
Expiration Date: August 31, 2004

The permittee submitted a permit renewal application on 02/25/2004. It is proposed that the current NPDES permit be reissued for a 5-year term in accordance with regulations promulgated at 40 CFR Part 122.46(a).

6. RECEIVING STREAM SEGMENT AND DISCHARGE LOCATION.

The outfalls are located at the following coordinates:

Outfall 001: Latitude: 35° 56' 12"; Longitude: 89° 43' 13"

Outfall 002: Latitude: 35° 56' 16"; Longitude: 89° 43' 02"

Outfall 003: Latitude: 35° 56' 31"; Longitude: 89° 42' 56"

The receiving waters named:

an unnamed ditch, thence to Ditch No. 38, thence to Crooked Lake Bayou, thence to Pemiscot Bayou (Ditch No. 29), thence to the Little St. Francis River, thence to the St. Francis River in Segment 5C of the St. Francis River Basin. The receiving stream is a Water of the State classified for secondary contact recreation, raw water source for public, industrial, and agricultural water supplies, propagation of desirable species of fish and other aquatic life, and other compatible uses (Outfalls 001, 002, and 003).

7. 303d List and Endangered Species Considerations

A. 303d List

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

B. Endangered Species:

No comments were received from the U.S. Fish and Wildlife Service (USF&WS). Therefore, no permit action is needed. The drafted permit and Fact Sheet were sent to the USF&WS for their review.

8. OUTFALL AND TREATMENT PROCESS DESCRIPTION.

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

Outfall 001: Average Flow = 0.446MGD, long term average flow

Outfall 002: Design Flow = 0.03 MGD

Outfall 003: Average Flow = 5.83 MGD, based on the highest monthly average flow during the last two years.

Type of treatment:

Outfall 001: Flocculation and sedimentation are used to treat the process wastewater from the Hot Mill operations. The process wastewater from the Cold Mill Pickling and Galvanization lines is pretreated via equalization. Treatment of the process wastewater generated from the R/T mill includes oil and water separation, pH adjustment, dissolved air flotation, and sand filtration. The treated effluent from the Cold Mill and the Hot Mill are routed to the lagoon on the southeast side of the property prior to final discharge via Outfall 001.

Outfall 002: grinding, screening, pre-aeration, sedimentation, activated sludge, and chlorine disinfection.

Outfall 003: non-contact cooling water from the enhanced casting operations will be discharged without treatment.

Discharge Description:

Outfall 001: treated process wastewater.

Outfall 002: treated sanitary wastewater.

Outfall 003: non-contact cooling water.

9. APPLICANT ACTIVITY.

The applicant's activities are the operation of a steel mill.

10. SEWAGE SLUDGE PRACTICES.

Outfall 001: Sludge produced by process activities is hauled to Lemons Sanitary Landfill by Peoria Disposal Company.

Outfall 002: Permittee has planned to obtain a separate land application permit for sanitary sludge disposal. Sludge produced by sanitary activities will be transferred to holding tanks on site until the land application permit is issued then land applied.

Outfall 003: No sludge is generated.

11. PERMIT CONDITIONS.

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

a. **Final Effluent Limitations**

Outfall 001-treated process wastewater (June – November)

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

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Total Suspended Solids (TSS)	452	1171	30	45	once/week	24-hr Composite
Oil and Grease (O & G)	154	364	10	15	once/week	grab
Lead, Total recoverable	1.42	3.28	11.7 (µg/l)	23.6 (µg/l)	once/month	24-hr Composite
Zinc, Total recoverable	1.53	4.61	283.3 (µg/l)	568.4 (µg/l)	once/week	24-hr Composite
Nickel, Total recoverable	0.038	0.113	10 (µg/l)	30 (µg/l)	once/week	24-hr Composite
Chromium, Total recoverable	0.050	0.125	Report (µg/l)	Report (µg/l)	once/week	24-hr Composite
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab
Temperature (Inst. Max)	N/A	N/A	N/A	89.6 °F	once/day	Instantaneous
Chronic Biomonitoring	N/A	N/A	See Page 29, # 12.F		once/quarter	24-hr composite

ii. **Solids, Foam, and Free Oil:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).

b. Final Effluent Limitations

Outfall 001-treated process wastewater (December – May)

i. Conventional and/or Toxic Pollutants

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Total Suspended Solids (TSS)	452	1171	30	45	once/week	24-hr Composite
Oil and Grease (O & G)	154	364	10	15	once/week	grab
Lead, Total recoverable	1.42	3.28	15.3 (µg/l)	30.7 (µg/l)	once/month	24-hr Composite
Zinc, Total recoverable	1.53	4.61	325.3 (µg/l)	652.8 (µg/l)	once/week	24-hr Composite
Nickel, Total recoverable	0.038	0.113	10 (µg/l)	30 (µg/l)	once/week	24-hr Composite
Chromium, Total recoverable	0.050	0.125	Report (µg/l)	Report (µg/l)	once/week	24-hr Composite
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab
Temperature (Inst. Max)	N/A	N/A	N/A	89.6 °F	once/day	Instantaneous
Chronic Biomonitoring	N/A	N/A	See Page 29, # 12.F		once/quarter	24-hr composite

ii. **Solids, Foam, and Free Oil:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).

c. **Interim Effluent Limitations**

Outfall 002-treated sanitary wastewater

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

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Biochemical Oxygen Demand (BOD5)	7.6	11.3	30	45	once/month	24-hr Composite
Total Suspended Solids (TSS)	7.6	11.3	30	45	once/month	24-hr Composite
Ammonia Nitrogen (NH3-N)	Report	Report	Report	Report	once/month	24-hr Composite
Fecal Coliform Bacteria (FCB)			(colonies/100ml)			
	N/A	N/A	1000	2000	once/month	grab
Oil and Grease (O & G)	2.5	3.8	10	15	once/month	grab
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/month	grab

ii. **Solids, Foam, and Free Oil:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).

d. **Final Effluent Limitations**

Outfall 002-treated sanitary wastewater

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

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Carbonaceous Biochemical Oxygen Demand (CBOD5)						
(May-Oct)	3.8	5.6	15	22.5	once/month	24-hr Composite
(Nov-Apr)	5.0	7.5	20	30	once/month	24-hr Composite
Total Suspended Solids (TSS)	5.0	7.5	20	30	once/month	24-hr Composite
Ammonia Nitrogen (NH3-N)						
(May-Oct)	1.3	1.9	5	7.5	once/month	24-hr Composite
(Nov-Apr)	2.5	3.8	10	15	once/month	24-hr Composite
Fecal Coliform Bacteria (FCB)			(colonies/100ml)			
	N/A	N/A	1000	2000	once/month	grab
Oil and Grease (O & G)	2.5	3.8	10	15	once/month	grab
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/month	grab

ii. **Solids, Foam, and Free Oil:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).

e. **Final Effluent Limitations**

Outfall 003-Non-contact cooling water

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

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>				<u>Monitoring Requirements</u>	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max		
Flow (MGD)	N/A	N/A	Report	Report	once/day	totalizing meter
Temperature (Inst. Max)	N/A	N/A	N/A	89.6°F	Once/week	Instantaneous
pH	N/A	N/A	<u>Minimum</u> 6.0 s.u.	<u>Maximum</u> 9.0 s.u.	once/week	grab

- ii. **Solids, Foam, and Free Oil:** There shall be no discharge of distinctly visible solids, scum or foam of a persistent nature, nor shall there be any formation of slime, bottom deposits or sludge banks. No visible sheen (Sheen means an iridescent appearance on the surface of the water).

12. BASIS FOR PERMIT CONDITIONS.

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

A. Technology-Based versus Water Quality-Based Effluent Limitations and Conditions

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

B. Technology-Based Effluent Limitations and/or Conditions

(1) General Comments

Regulations promulgated at 40 CFR Part 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on effluent limitations guidelines where applicable, on Best Professional Judgment (BPJ) in the absence of guidelines, or on a combination of the two.

(2) Applicable Effluent Limitations Guidelines or Best Professional Judgment of the Permit Writer

Outfall 001:

Discharges from outfall 001 are covered by Federal effluent limitations guidelines promulgated under 40 CFR Part 420 Iron and Steel Manufacturing Point Source Category.

(3) Process wastewater (Outfall 001):

The production data submitted with the reapplication was found to agree with past production data upon which prior permits have been based. The present technology-based limits and monitoring requirements are continued based on the previous NPDES permit, 40 CFR Part 420 and 40 CFR Part 122.44(1).

Operations consuming water and generating wastewater at Nucor Steel – Arkansas can be divided in two major categories: Hot mill operations and Cold Mill operations. Hot Mill involves use of three principle production lines: Steel making (Subpart D), Continuous casting (Subpart F), Hot forming mill (Subpart G). Cold Mill involves use of four production lines: Acid pickling line

(Subpart F), Cold rolling mill (Subpart J), Alkaline cleaning line (Subpart K), and Hot coating line (Subpart L). All production lines generate wastewater that must meet technology – based effluent limitations. All technology based limitations are derived from the applicable New Source Performance Standards (NSPS) and are continued from previous permit. The federal effluent limitations are based on the amount of production from a particular process (see the following tables below). The technology based limitations that apply to this facility are calculated multiplying the federal limitation by the applicable rate (See Equation No. 1). The following tables present the applicable federal effluent limitations and the resultant production-based effluent limitations for each of production lines. Additionally, the detail calculations for Technology based limits are presented in **Attachment 7**.

$$\text{Mass of Pollutant (lb/day)} = \text{Production (1000 lb/day)} \times \text{NSPS Multiplier (lbs/1000lb)} \quad (1)$$

Regulatory authority at 49 FR 37998 (September 26, 1984) indicates that production-based permit limits are to be based on a reasonable measure of actual production, not upon the design capacity of the facility. This document considers production during the high month of the previous year as a reasonable measure of actual production for the facility. Accordingly, the production rates in those high production months in past twelve months (April 2004 – March 2005, See below table) were used as the “reasonable measure of actual production” figures to be used with mass limitation set forth at 40 CFR 420.

Production				
Nucor Steel Production Volume: based on the high month of the last year (2003) for Hot and Cold Mills				
	Subpart	Highest Month (Tons Tapped)	Days of Operation	Production * (1000 lb/day)
Hot Mill	F (Continuous casting)	266,248	30	17,750
	G (Hot forming mill)			
Cold Mill	I (Pickle Line)	98,151	30	6,543
	J (Reversing Mill)	89,847	30	5,990
	K (Temper Mill)	20,662	30	1,377
	L (Galvanize Line)	56,532	30	3,769

* Production (1000 lb/day) = Highest Month (Tons Tapped)X(2000 lbs/ton) / Days of Operation

Hot Mill: Subpart D, Subpart F, Subpart G (See the following table):

40 CFR 420.44 (a)- Subpart D-Steel Making subcategory.
Electric arc furnace Steel making –semi–wet: Reserved

Daily Maximum				
40 CFR 420.64(b)(2)- Subpart F-Continuous casting subcategory.				
Pollutant	Max. Daily ELG (Multiplier) (lb/1000 lb)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent** Max. Daily Concentration (mg/l)
TSS	0.00730	17,750	129.57	34.83
O & G	0.00313	17,750	55.55	14.93
Lead	0.0000939	17,750	1.67	448 (µg/l)
Zinc	0.000141	17,750	2.50	672 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

** Concentration (mg/l) = mass loading (lbs/day) divided by the long term average flow (0.446 MGD) and appropriate conversion factor (8.34). (See Attachment 7 for the detail Calculations)

Monthly Average				
40 CFR 420.64(b)(2)- Subpart F-Continuous casting subcategory.				
Pollutant	Average Monthly NSPS (Multiplier) (lb/1000 lb)	Production (1000lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.00261	17,750	46.33	12.45
O & G	0.00104	17,750	15.34	4.96
Lead	0.0000313	17,750	0.56	149 (µg/l)
Zinc	0.0000469	17,750	0.83	224 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Daily Maximum				
40 CFR 420.74(C)(1)- Subpart G-Hot forming subcategory.				
Pollutant	Max. Daily NSPS (Multiplier) (lb/1000 lb)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent Max. Daily Concentration (mg/l)
TSS	0.0435	17,750	772.80	207.58
O & G	0.0109	17,750	193.46	52.01
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Monthly Average				
40 CFR 420.74(C)(1)- Subpart G-Hot forming subcategory.				
Pollutant	Average Monthly NSPS (Multiplier) (lb/1000 lb)	Production (1000 lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.0163	17,750	289.32	77.78
O & G	0.00545*	17,750	96.74	26.01
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

* In absence of the Monthly Average multiplier for Oil & Grease, 1/2 of the Max. Daily multiplier (0.0109 / 2 = 0.00545) limit has been used.

Cold Mill: Subpart I, Subpart J, Subpart K, Subpart L (See the following table):

Daily Maximum				
40 CFR 420.94(b)(2)- Subpart I-Hydrochloric acid pickling effluent limitations.				
Pollutant	Max. Daily NSPS (Multiplier)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent Max. Daily Concentration (mg/l)
TSS	0.0117	6,543	76.55	20.58
O & G	0.00501	6,543	32.78	8.81
Lead	0.0000751	6,543	0.49	132 (µg/l)
Zinc	0.000100	6,543	0.65	175 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Monthly Average				
40 CFR 420.94(b)(2)- Subpart I-Hydrochloric acid pickling effluent limitations.				
Pollutant	Average Monthly NSPS (Multiplier)	Production (1000 lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.00501	6,543	32.78	8.81
O & G	0.00167	6,543	10.92	2.94
Lead	0.000025	6,543	0.16	44 (µg/l)
Zinc	0.0000334	6,543	0.22	59 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Daily Maximum				
40 CFR 420.104(a)(1)-Subpart J-Cold rolling mills. Recirculation-single stand.				
Pollutant	Max. Daily ELG (Multiplier)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent Max. Daily Concentration (mg/l)
TSS	0.00125	5990	7.49	2.01
O & G	0.000522	5990	3.13	0.84
Chromium	0.0000209	5990	0.125	34 (µg/l)
Lead	0.00000940	5990	0.056	15 (µg/l)
Nickel	0.0000188	5990	0.113	30 (µg/l)
Zinc	0.00000630	5990	0.038	10 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Monthly Average				
40 CFR 420.104(a)(1)-Subpart J-Cold rolling mills. Recirculation-single stand.				
Pollutant	Average Monthly ELG (Multiplier)	Production (1000 lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.000626	5990	3.75	1.0
O & G	0.000209	5990	1.25	0.37
Chromium	0.0000084	5990	0.0503	14 (µg/l)
Lead	0.00000310	5990	0.0185	5.0 (µg/l)
Nickel	0.0000063	5990	0.0377	10.0 (µg/l)
Zinc	0.0000021	5990	0.0126	3.38 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Daily Maximum				
40 CFR 420.114(a)- Subpart K – Alkaline cleaning - Batch and continuous.				
Pollutant	Max. Daily NSPS (Multiplier)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent Max. Daily Concentration (mg/l)
TSS	0.0146	1,377	20.1	5.40
O & G	0.00626	1,377	8.62	2.32
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Monthly Average				
40 CFR 420.114(a)- Subpart K – Alkaline cleaning - Batch and continuous.				
Pollutant	Average Monthly ELG (Multiplier)	Production (1000 lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.00626	1,377	8.62	2.32
O & G	0.00209	1,377	2.88	0.77
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Daily Maximum				
40 CFR 420.124(a)(1)-Subpart L-Galvanizing Operations.				
Pollutant	Max. Daily ELG (Multiplier)	Production (1000 lb/day)	Mass Max. Daily (lb/day)	Equivalent Max. Daily Concentration (mg/l)
TSS	0.0438	3,769	165.08	44.38
O & G	0.0188	3,769	70.85	19.05
Lead	0.000282	3,769	1.0628	286 (µg/l)
Zinc	0.000376	3,769	1.417	381 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Monthly Average				
40 CFR 420.124(a)(1)-Subpart L-Galvanizing Operations.				
Pollutant	Average Monthly ELG (Multiplier)	Production (1000 lb/day)	Mass Monthly Average (lb/day)	Equivalent Monthly Average Concentration (mg/l)
TSS	0.0188	3,769	70.86	19.05
O & G	0.00626	3,769	23.59	6.34
Lead	0.0000939	3,769	0.3539	95 (µg/l)
Zinc	0.000125	3,769	0.4711	127 (µg/l)
pH	6.0-9.0 s.u.	-----	6.0-9.0 s.u.	6.0-9.0 s.u.

Combined Technology Based Effluent Limitations								
	Hot Mill		Cold Mill				Combined Limits	
Pollutant	Subpart F (lb/day)	Subpart G (lb/day)	Subpart I (lb/day)	Subpart J (lb/day)	Subpart K (lb/day)	Subpart L (lb/day)	Total Mass (lb/day)	Concentration (mg/l)
TSS (max)	129.57	772.13	76.55	7.49	20.1	165.08	1171	315
TSS (Avg)	46.33	289.13	32.75	3.75	8.62	70.86	452	121
O & G (max)	55.55	193.46	32.78	3.13	8.62	70.86	364	98
O & G (Avg)	18.46	96.74	10.92	1.25	2.88	23.59	154	41
Lead (max)	1.67	-----	0.49	0.056	-----	1.0628	3.28	881 (µg/l)
Lead (Avg)	0.56	-----	0.160	0.0503	-----	0.3539	1.424	383 (µg/l)
Nickel (max)	-----	-----	-----	0.113	-----	-----	0.113	30 (µg/l)
Nickel (Avg)	-----	-----	-----	0.0377	-----	-----	0.038	10 (µg/l)
Chromium (max)	-----	-----	-----	0.125	-----	-----	0.125	34 (µg/l)
Chromium (Avg)	-----	-----	-----	0.05	-----	-----	0.05	14 (µg/l)
Zinc (max)	2.50	-----	0.65	0.038	-----	1.417	4.61	1238 (µg/l)
Zinc (Avg)	0.83	-----	0.22	0.0126	-----	0.4711	1.53	412 (µg/l)
pH	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.	6.0-9.0 s.u.

Equivalent concentration limits have been developed under the authority of 40 CFR Part 122.45 (f) (2) to supplement the mass loading limits in order to encourage and insure proper operation of the treatment system at all times. Technology – based pollutant concentration limits have been calculated based on the present technology – based mass loading limits and the long term average flow, using the equation shown below:

$$\text{Pollutant concentration (mg/l)} = \text{Pollutant mass (lb/day)} / \text{Flow X 8.34}$$

Technology Based Limits (40 CFR 420)		
Pollutant	Equivalent Concentration	
	Monthly Avg.	Daily Max
Total Suspended Solids (mg/l)	121	315
Oil and Grease (mg/l)	41	98
Lead, Total recoverable (µg/l)	383	881
Zinc, Total recoverable (µg/l)	412	1238
Nickel, Total recoverable (µg/l)	10	30
Chromium, Total recoverable (µg/l)	Report	Report
pH	6.0-9.0 s.u.	

Total Suspended Solids (TSS):

TSS limits are continued from previous permit based on 40 CFR Part 122.44(l).

Naphthalene and Tetrachloroethylene:

The review of the DMRs data for Naphthalene and tetrachloroethylene for the last five years indicates “non-detect” for these parameters. Permittee by the letter dated March 14, 2005, certified that has not, does not, and does not intend in the future to use Naphthalene and tetrachloroethylene at this facility. Therefore, naphthalene and tetrachloroethylene limitations have been removed for the term of the permit (5 years) based on 40 CFR 122.44 (a)(2). Additionally, in regards to this certification, Condition No. 5 of Part III has been added to the permit. Removing the limitations for naphthalene and tetrachloroethylene does not violate the antibacksliding provision based on 40 CFR 122(1)(2)(i)B(1).

Chromium Hexavalent:

40 CFR 420, Subpart L (galvanizing operations) establishes effluent limitations for Hexavalent Chromium (Cr⁺⁶). Effluent limits are applicable according to the guideline only to galvanizing operations which discharge wastewater from the chromate rinse step. Nucor Steel has certified by the letters dated October 26, 2004 and March 14, 2005, that wastewater from chromate rinse cycle is not discharged and disposed off-site.

Outfall 002: Interim Limits:

BOD5 and TSS limits are continued from previous permit based on 40 CFR Part 122.44 (l).

(4) **Storm water runoff**

Effluent limitations guidelines have not been promulgated for discharges of this sort. Therefore under the authority of Section 402 (a) (1) of the Clean Water Act and State laws, the State has developed a permit on a case-by-case basis. Storm water pollution prevention plan requirements are not included because facility is covered under NPDES General Storm water ARR00A870.

C. **State Water Quality Numerical Standards Based Limitations**

(1) **Conventional and Non-Conventional Pollutants**

Outfall 001:

pH, oil and grease, and temperature limitations are continued from previous permit based on Chapter 5, Sections 2.504, 2.510, and 2.502 of Regulation No. 2 as amended, respectively. The mass loading (lb/day) are based on technology limits.

Temperature Calculations

Instream waste concentration (IWC) was calculated as follows:

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

where:

IWC = instream concentration of temperature (°F)

C_e = Temperature concentration in effluent= 93.8 °F (highest reported value in DMRs)

Q_e = effluent flow of the facility = 0.446 MGD = 0.69 cfs

C_b = background temperature = 32 °F (Channel – Altered, Reg No. 2)

Q_b = background flow of receiving stream = 0 cfs

WQ = 89.6 °F (Delta Ecoregion)

Substituting,

$$IWC = ((93.8 \text{ °F} \times 0.69 \text{ cfs}) + (32 \text{ °F} \times 0 \text{ cfs})) / (0.69 \text{ cfs} + 0 \text{ cfs})$$

$$IWC = 93.8 \text{ °F} > 89.6 \text{ °F AWQS}$$

The temperature limitation for Outfall 001 are continued from previous permit based on 40 CFR 122.44 (d) and 40 CFR 122.44 (l). However, as requested by the letter dated April 15, 2005, the permittee shall perform an evaluation of the temperature regime of the pond for the purpose of determining if the elevation of temperatures in the equalization basin is related to ambient sources of heat resulting from summer time conditions. However, in accordance with Condition No. 6 of Part III, this permit may be modified to remove the temperature limitation for Outfall 001 if the

evaluation documents show that the elevation of water temperatures in the pond are related to ambient sources of heat under summer time conditions.

Outfall 002:

Interim Limits:

A three-year schedule of compliance with monitoring and reporting requirements for Ammonia – Nitrogen (NH₃-N) is included based on Section 2.104 of Regulation No. 2. Fecal Coliform Bacteria, pH, and oil and grease limitations are based on Chapter 5, Sections 2.507, 2.504, and 2.510 of Regulation No. 2 as amended, respectively. The calculation of loadings (lbs/day) uses a design flow of 0.03 MGD, the pollutant concentrations, and the following equation.

$$\text{Lbs/day} = \text{Concentration (mg/l)} \times \text{Flow (MGD)} \times 8.34$$

Final Limits:

Final effluent limits basis is a desk top model performed by staff on November 8, 2004. These limitations are included in the updated Arkansas Water Quality Management Plan (WQMP). The calculation of the loadings (lbs per day) uses a design flow of 0.03MGD and the following equation. Fecal Coliform Bacteria, pH, and oil and grease limitations are based on chapter 5, Sections 2.507, 2.504, and 2.510 of Regulation No. 2 as amended, respectively.

$$\text{Lbs/day} = \text{Concentration (mg/l)} \times \text{Flow (MGD)} \times 8.34$$

Outfall 003:

pH and temperature limitations are continued from previous permit based on Chapter 5, Sections 2.504 and 2.502 of Regulation No. 2 as amended, respectively.

D. Toxics Pollutants-Priority Pollutant Scan (PPS)

(1) General Comments

Effluent limitations and/or conditions established in the permit are in compliance with the Arkansas Water Quality Standards and the applicable Water Quality Management Plan.

(2) 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.

(3) **Implementation**

The State of Arkansas is currently implementing EPA's Post Third-Round Policy in conformance with the EPA Regional strategy. The 5-year NPDES 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 NPDES permits. State narrative and numerical water quality standards from the 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.

(4) **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 following expression was used to calculate the pollutant instream waste concentration (IWC):

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

Where:

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

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

Q_e = effluent flow of facility (cfs)

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

Q_b = background flow of receiving stream (cfs)

The following values were used in the IWC calculations:

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

Q_e = 0.446 MGD = 0.69 cfs, long term average flow

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

Q_b = (See below):

e. Aquatic Toxicity

Chronic Toxicity: For the months of June through November Flow = 0 cfs, for comparison with chronic aquatic toxicity. This flow is **67** percent of the 7-day, 10-year low-flow (7Q10) for the receiving stream. The 7Q10 of 0 cfs is based on "Identification and Classification of Perennial Stream of Arkansas", Arkansas Geological Commission Map. For the months of December through May flow = 0.67 cfs X (7Q10 = 1 – Qd) which is based on Section 2.106 of Regulation 2 for a seasonal fishery.

Acute Toxicity: For the months of June through November flow = **0** cfs, for comparison with acute aquatic toxicity. This flow is **33** percent of the 7-day, 10-year low-flow (7Q10) for the receiving stream. For the months of December through May flow=**0.33** cfs X (7Q10 = 1 – Qd) which is based on Section 2.106 of Regulation 2 for a seasonal fishery.

f. Bioaccumulation

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

g. Drinking Water

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

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

Hardness = 81 mg/l, based on attachment VI of CPP.

pH = 7.56 s.u., based on compliance data from Arkansas Water Quality Inventory Report 305(b) Water Quality Data Base System, utilizing ADEQ accumulated data for Station FRA08 (St. Francis River at Lake City).

(5) 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.

(6) 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 1A**). However, Federal Regulations cited at 40 CFR 122.45(c) require that effluent limitations for metals in NPDES permits be expressed as total recoverable (See Pages 1 and 6 of **Attachment 1A**). Therefore a dissolved to the total recoverable metal conversion must be implemented. This involves determining a linear partition coefficient for the metal of concern and using this coefficient to determine the fraction of metal dissolved, so that the dissolved metal ambient criteria may be translated to a total effluent limit. The formula for converting dissolved metals to total recoverable metals for streams and lakes are provided in **Attachment 2** and Region 6 Implementation Guidance for Arkansas Water Quality Standards promulgated at 40 CFR 131.36.

(7) Results of the comparison of the submitted information with the appropriate water quality standards and criteria

The following pollutant was determined to be present in the effluent reported by the permittee.

Pollutant	Concentration Reported, µg/l	MQL, µg/l
Antimony, Total Recoverable	132	60

However, ADEQ has determined from the information submitted by the permittee that no water quality standards or Gold Book criteria are exceeded. Therefore, no permit action is necessary to maintain these standards or criteria (See **Attachments 1A & 1B**).

Under Federal Regulation 40 CFR 122.44(d), as adopted by Regulation No. 6, if a discharge poses the reasonable potential to cause or contribute to an exceedance above the Water Quality standards, the permit must contain effluent limitations for those pollutants (See **Attachments 5A and 5B**). Therefore, discharge of Technology limitations were compared with the Water Quality

limitations for Lead (Pb), Nickel (Ni), and Zinc (Zn) at Outfall 001. The results indicate that the Water Quality concentration limitations for Lead (Pb) and Zinc (Zn) are more stringent than Technology limitations, therefore Water Quality limitations are included in the permit (6A and 6B). A schedule of compliance for Lead (Pb) and Zinc (Zn) is not included because a schedule covering three years for compliance was included in the previous permit for Outfall 001. Technology limitations for Nickel (Ni) are more stringent than Water Quality limits. Therefore, Technology limits for Nickel (Ni) are included.

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:

$$WLA_c = (WQS_c \times (Q_d + Q_b) - (Q_b \times C_b)) / Q_d$$

where:

WLA_c = Chronic waste load allocation ($\mu\text{g/l}$)

Q_d = Discharge flow at outfall 001 = 0.446 MGD = 0.69 cfs
 background flow for Critical Season (June – November)

$Q_b = 0.67 \times 7Q_{10} = 0.67 \times 0 \text{ cfs} = 0 \text{ cfs}$

background flow for Primary Season (December - May)

$Q_b = 0.67 \text{ cfs} \times (7Q_{10} = 1 - Q_d) = 0.21 \text{ cfs}$, which is based on Section 2.106 of Regulation 2 for a seasonal fishery

C_b = Background concentration ($\mu\text{g/l}$) = 0 $\mu\text{g/l}$

WQS_c = Chronic aquatic toxicity standards ($\mu\text{g/l}$)

Substituting,

$$WLA_c \text{ (June – November)} = (WQS_c \times (Q_d + 0) - (0 \times 0)) / Q_d$$

$$WLA_c \text{ (December - May)} = (WQS_c \times (Q_d + 0.21) - (0.21 \times 0)) / Q_d$$

$$WLA_c = WQS_c$$

and;

$$WLA_a = (WQS_a \times (Q_d + Q_b) - (Q_b \times C_b)) / Q_d$$

where:

WLA_a = acute waste load allocation ($\mu\text{g/l}$)

Q_d = discharge flow at outfall 001 = 0.466 = 0.69 cfs

Background flow for Critical Season (June – November)

$Q_b = 0.33 \times 7Q_{10} = 0.33 \times 0 \text{ cfs} = 0 \text{ cfs}$

background flow for Primary Season (December - May)

$Q_b = 0.33 \text{ cfs} \times (7Q_{10} = 1 - Q_d) = 0.1 \text{ cfs}$, which is based on Section 2.106 of Regulation 2 for a seasonal fishery.

$C_b = \text{background concentration } (\mu\text{g/l}) = 0 \mu\text{g/l}$

$WQS_a = \text{acute aquatic toxicity standards } (\mu\text{g/l})$

Substituting,

$$WLA_a = (WQS_a \times (Q_d + 0) - (0 \times C_b)) / Q_d$$

$$WLA_a = (WQS_a \times (Q_d + 0.1) - (0.1 \times C_b)) / Q_d$$

$$WLA_a = WQS_a$$

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

$$LTA_c = 0.72 \times WLA_c$$

$$LTA_a = 0.57 \times WLA_a$$

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

$$AML = 1.55 \times \text{Limiting LTA}$$

$$MDL = 3.11 \times \text{Limiting LTA}$$

The results of these calculations are as follows (See **Attachment 6A & 6B**):

Arkansas Numerical Aquatic Toxicity Limits		
Pollutant	AML*, $\mu\text{g/l}$	DML*, $\mu\text{g/l}$
Nickel, Total recoverable		
June – November	322.7	647.4
December - May	419.8	842.3
Lead, Total recoverable		
June – November	11.7	23.5
December - May	15.3	30.7
Zinc, Total recoverable		
June – November	283.3	568.4
December - May	325.3	652.7
* See Attachment 5A, 5B, 6A, and 6B		

E. Final Limitations

The following effluent concentration limitations or "report" requirements were placed in the permit based on the more stringent of the technology-based, water quality-based or previous NPDES permit limitations:

Outfall 001:

Parameter	Water Quality-Based		Technology-Based/BPJ		Previous NPDES Permit		Final Permit	
	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.
Total Suspended Solids (mg/l)	N/A	N/A	121	315	30	45	30	45
Oil and Grease (mg/l)	10	15	41	98	10	15	10	15
Lead, Total recoverable (µg/l)								
June - November	11.7	23.6	383	881	11.7	23.5	11.7	23.6
December - May	15.3	30.7	383	881	12.5	25.0	15.3	30.7
Zinc, Total recoverable (µg/l)								
June - November	283.3	568.4	412	1238	281.9	584.2	283.3	568.4
December - May	325.3	652.7	412	1238	291.1	584.2	325.3	652.8
Nickel, Total recoverable (µg/l)								
June - November	322.7	647.4	10	30	6.6	20	10	30
December - May	419.8	842.3	10	30	6.6	20	10	30
Chromium, Total recoverable (µg/l)	N/A	N/A	Report	Report	9	22.1	Report	Report
Temperature (Inst. Max) °F	N/A	89.6	N/A	N/A	N/A	89.6	N/A	89.6
pH	6.0-9.0 s.u.		6.0-9.0 s.u.		6-9 s.u.		6-9 s.u.	

Outfall 002: Final limitations

Parameter	Water Quality-Based		Technology-Based/BPJ		Previous NPDES Permit		Final Permit	
	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l
CBOD5								
(May-Oct)	15	22.5	N/A	N/A	30*	45*	15	22.5
(Nov-Apr)	20	30	N/A	N/A	30*	45*	20	30
TSS	20	30	N/A	N/A	30	45	30	45
NH3-N								
(May-Oct)	5	7.5	N/A	N/A	N/A	N/A	5	7.5
(Nov-Apr)	10	15	N/A	N/A	N/A	N/A	10	15
FCB (col/100ml)	1000	2000	N/A	N/A	1000	2000	1000	2000
O & G	10	15	N/A	N/A	10	15	10	15
pH	6.0-9.0 s.u.		N/A		6-9 s.u.		6.0-9.0 s.u.	

* BOD5

Outfall 003:

Parameter	Water Quality-Based		Technology-Based/BPJ		Previous NPDES Permit		Final Permit	
	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l
Temperature (Inst. Max) °F	N/A	89.6	N/A	N/A	N/A	89.6	N/A	89.6
pH	6.0-9.0 s.u.		N/A		6-9 s.u.		6.0-9.0 s.u.	

F. Biomonitoring

Section 101(a)(3) of the Clean Water Act states that ".....it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In addition, ADEQ is required under 40 CFR Part 122.44(d)(1), adopted by reference in Regulation 6, to include conditions as necessary to achieve water quality standards as established under Section 303 of the Clean Water Act.

Arkansas has established a narrative criteria which states "toxic materials shall not be present in receiving waters in such quantities as to be toxic to human, animal, plant or aquatic life or to interfere with the normal propagation, growth and survival of aquatic biota."

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

TOXICITY TESTS

Chronic Biomonitoring

FREQUENCY

once/quarter (Four per year)

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

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

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

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

December through May:

$$Q_d = \text{Average flow} = 0.446 \text{MGD} = 0.69 \text{ cfs}$$

$$\text{Critical Flow} = 1 \text{ cfs} - \text{Average flow} = 1 \text{ cfs} - 0.69 \text{ cfs} = 0.31 \text{ cfs}$$

$$Q_b = \text{Background flow} = (0.67) \times 7Q10 = 0.67 \times 0.31 = 0.21$$

$$CD = (0.69) / (0.69 + 0.21) \times 100 = 77 \%$$

June through November:

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

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

$$CD = (0.69) / (0.69 + 0) \times 100 = 100\%$$

Toxicity tests shall be performed in accordance with protocols described in "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", EPA/600/4-91/002, July 1994. A minimum of five effluent dilutions in addition to an appropriate control (0%) are to be used in the toxicity tests. These additional effluent concentrations during the months of June through November are **100%, 75%, 56%, 42%, and 32%** (See **Attachment I** of CPP). The low-flow effluent concentration (critical dilution) is defined as **100%** effluent based on a 7Q10 of 0 cfs. During the months of December through May the additional concentrations for the seasonal fishery use are **77 %, 58 %, 43 %, 32 % and 24 %**. The low-flow effluent concentration (critical dilution) is defined as **77 %** effluent based on a 0.21 cfs of the receiving stream.

The requirement for chronic biomonitoring tests is based on the magnitude of the facility's discharge with respect to receiving stream flow. The stipulated test species, *Ceriodaphnia dubia* and the Fathead Minnow (*Pimephales promelas*) are indigenous to the geographic area of the facility; the use of these is consistent with the requirements of the State water quality standards. The biomonitoring frequency has been established to provide data representative of the toxic potential of the facility's discharge, in accordance with the regulations promulgated at 40 CFR Part 122.48.

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

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

Administrative Records

The following information summarized toxicity test submitted by the permittee during the term of the current permit at outfall **001** (See **Attachment 4**)

G. Sample Type and Sampling Frequency

Regulations promulgated at 40 CFR 122.44(i) (1) require permit to establish monitoring requirements which assure compliance with permit limitations. The requirements for sample type and sampling frequency have been based on the current NPDES permit except the monitoring frequency for lead has changed from once per week to once per month.

H. Changes from the previously issued permit

Outfalls 001, 002, and 003:

1. Parts II, III, and IV have been revised.
2. Odor language has been deleted.
3. Reopener language has been included.
4. pH limits have been changed from 6-9 s.u. to 6.0-9.0 s.u.
5. Facility section has been corrected.
6. The receiving stream description has been corrected.

Outfall 001:

7. The interim limits and the schedule of compliance for Lead and Zinc have been removed.
8. Biomonitoring dilution series and critical dilution for the months of December through May have been changed.
9. Concentration limits for Lead (Pb) and Zinc (Zn) for the months of December through May have changed.
10. Concentration limits for limits for Nickel (Ni) have changed.
11. Tetrachloroethylene, and Naphthalene limitations have been removed.
12. A condition for Tetrachloroethylene, and Naphthalene has been added to Part III.
13. Mass limits for TSS, O&G, Lead (Pb), Zinc (Zn), Total Chromium, and Nickel (Ni) have been changed.
14. A condition for the evaluation of the temperature regime of the pond has been added.
15. Concentration limits for the Total Chromium have been removed.
16. Concentration limits for Zinc (Zn) for the months of June through November have been corrected.
17. Monitoring frequency for lead has changed from once per week to once per month.

Outfall 002:

18. A schedule of compliance, interim, and final limitations for CBOD5, TSS, and Ammonia-Nitrogen for outfall 002 have been added.
19. Mass limits for Oil and Grease have been corrected to more accurate values.
20. Daily Maximum Mass limits for BOD5 and TSS have been corrected to more accurate values.

13. SCHEDULE OF COMPLIANCE.

Compliance with final effluent limitations is required by the following schedule:

Outfalls 001 and 003:

Compliance is required on the effective date of the permit.

Outfall 002:

Interim Limits :

Compliance with Interim limitations is required on the effective date of the permit.

Final Limits :

The permittee shall submit progress reports addressing the progress towards meeting the new water quality limits in accordance with the following schedule:

<u>ACTIVITY</u>	<u>DUE DATE AFTER EFFECTIVE DATE</u>
Progress Report	One (1) Year
Progress Report	Two (2) Years
Meet final limitations	Three (3) years

Compliance with final limits for CBOD5, TSS, and NH3-N is required three years from effective date of the permit.

Outfall 001: Temperature

1. Within 90 days of permit issuance, the permittee shall submit a protocol for the evaluation of the temperature regime of the pond for the purpose of determining if the elevation of the temperatures in the equalization basin are related to ambient sources of heat resulting from summer time conditions.
2. The evaluation shall be completed within 18 months of permit issuance.

14. OPERATION AND MONITORING.

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

15. SOURCES.

The following sources were used to draft the permit:

- A. NPDES application No. AR0045977 received 02/25/2004.
- B. Arkansas Water Quality Management Plan (WQMP).
- C. Regulation No. 2.
- D. Regulation No. 6.
- E. 40 CFR 122, 125, 420.
- F. NPDES permit file AR0045977.
- G. Discharge Monitoring Reports (DMRs).
- H. "Arkansas Water Quality Inventory Report 2000 (305B)", ADEQ.
- I. "Identification and Classification of Perennial Streams of Arkansas", Arkansas Geological Commission.
- J. Continuing Planning Process (CPP).
- K. Technical Support Document For Water Quality-based Toxic Control.
- L. Letter from Mr. Vince Blubaugh, GBMc (Permittee's Consultant), to Mr. Martin Maner, ADEQ, dated March 14, 2005.
- M. Letter from Mr. Wayne D. Turner, Nucor- Steel - Arkansas to Mr. Mo Shafii, ADEQ, dated April 15, 2005.
- N. E-mail from Mr. James Yankee, Blytheville Wastewater Department to Mr. Parviz Mokhtari, dated February 15, 2005.
- O. E-mail from Mr. Wynne Turney, Nucor- Steel - Arkansas to Mr. Parviz Mokhtari, dated May 24, 2005.

16. NPDES POINT OF CONTACT.

For additional information, contact:

Parviz Mokhtari
NPDES Branch, Water Division
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8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913
Telephone: (501) 682-0622

Attachment 1

[PPS]

Attachment 2

Linear Partition Coefficients for Priority Metals in Streams and Lakes*

METAL	STREAMS		LAKES	
	K _{po}	a	K _{po}	a
Arsenic	0.48 X 10 ⁶	-0.73	0.48 X 10 ⁶	-0.73
Cadmium	4.00 X 10 ⁶	-1.13	3.52 X 10 ⁶	-0.92
Chromium**	3.36 X 10 ⁶	-0.93	2.17 X 10 ⁶	-0.27
Copper	1.04 X 10 ⁶	-0.74	2.85 X 10 ⁶	-0.9
Lead***	2.80 X 10 ⁶	-0.8	2.04 X 10 ⁶	-0.53
Mercury	2.90 X 10 ⁶	-1.14	1.97 X 10 ⁶	-1.17
Nickel	0.49 X 10 ⁶	-0.57	2.21 X 10 ⁶	-0.76
Silver****	2.40 X 10 ⁶	-1.03	2.40 X 10 ⁶	-1.03
Zinc	1.25 X 10 ⁶	-0.7	3.34 X 10 ⁶	-0.68

$$K_p = K_{po} \times TSS^a$$

K_p = Linear Partition Coefficient

TSS = Total Suspended Solids (mg/l)-(See **Attachment 3**)

K_{po} = found from table

a = found from table

$$C/C_t = 1/(1 + (K_p \times TSS \times 10^{-6})) \quad C/C_t = \text{Fraction of Metal Dissolved}$$

* Delos, C. G., W. L. Richardson, J. V. DePinto, R. B., Ambrose, P. W. Rogers, K. Rygwelski, J. P. St. John, W. J. Shaughnessey, T. A. Faha, W. N. Christie. Technical Guidance for Performing Waste Load Allocations, Book II: Streams and Rivers. Chapter 3: Toxic Substances, for the U. S. Environmental Protection Agency.(EPA-440/4-84-022).

** Linear partition coefficient shall not apply to the Chromium VI numerical criterion. The approved analytical method for Chromium VI measures only the dissolved form. Therefore permit limits for Chromium VI shall be expressed in the dissolved form. See 40 CFR 122.45(c)(3).

*** Reference page 18 of EPA memo dated March 3, 1992, from Margaret J. Stasikowski(WH-586) to Water management Division Directors, Region I-IX.

**** Texas Environmental Advisory Council, 1994

Attachment 3

TOTAL SUSPENDED SOLIDS(15th PERCENTILE) BY RECEIVING STREAM AND ECOREGION

For direct discharges to the Arkansas, Red, Ouachita, White, and St. Francis Rivers use the following mean values:

TSS (15th percentile)		
Receiving Stream	TSS	Unit
Arkansas River:		
Ft. Smith to Dardanelle Dam	12.0	mg/l
Dardanelle Dam to Terry L&D	10.5	mg/l
Terry L&D to L&D #5	8.3	mg/l
L&D #5 to Mouth	9.0	mg/l
Red River	33	mg/l
Ouachita River:		
above Caddo River	2.0	mg/l
below Caddo River	5.5	mg/l
White River:		
above Beaver Lake	2.5	mg/l
Bull Shoals to Black River	3.3	mg/l
Black River to Mouth	18.5	mg/l
St. Francis River	18	mg/l

For all other discharges use the following ecoregion TSS:

TSS (15th percentile)		
Ecoregion	TSS	Unit
Ouachita	2	mg/l
Gulf Coastal	5.5	mg/l
Delta	8	mg/l
Ozark Highlands	2.5	mg/l
Boston Mountains	1.3	mg/l
Arkansas River Valley	3	mg/l

Attachment 4

BIOMONITORING FREQUENCY RECOMMENDATION AND RATIONALE FOR ADDITIONAL REQUIREMENTS

Permit Number: **AR0045977**

Facility Name: Nucor Steel - Arkansas, Division of Nucor Corporation

Previous Critical Dilution: **100% (June – November) and 93.8% (December – May)**

Proposed Critical Dilution: **100% (June – November) and 77% (December – May)**

Date of Review: **11-23-04**

Name of Reviewer: **Clem**

Number of Test Performed during previous 5 years by Species:

***Pimephales promelas* (Fathead minnow) : 24**

***Ceriodaphnia dubia* (water flea): 30**

Failed Test Dates during previous 5 years by Species:

***Pimephales promelas* (Fathead minnow): Lethal and sub-lethal: 4-00**

***Ceriodaphnia dubia* (water flea): Lethal: 4-00, 7-04, 8-04, 9-04**

Sublethal: 4-00, 3-01, 4-01, 5-01, 8-02, 7-04, 8-04, 9-04

Previous TRE Activities: None (currently developing evaluation for recent failures)

Frequency Recommendation by Species:

***Pimephales promelas* (Fathead minnow): Four/year or once/quarter**

***Ceriodaphnia dubia* (water flea): Four/year or once/quarter**

Additional Requirements (including WET Limits) Rationale/Comments Concerning Permitting:

Rationale: *Continuous Planning Process, 2000, Appendix D.E.2.b.* “If the permittee has a history of sporadic toxicity, toxicity testing frequency shall be twelve times a year for both species.”

The permittee has been proactive in initiating the development of an evaluation protocol for any future biomonitoring failures, therefore the recommended frequency has been changed to quarterly, for both *Ceriodaphnia dubia* and *Pimephales promelas*. A reduction in monitoring provides resources can be used for effluent characterizations in the future.

Attachment 5

Attachment 7

The detail calculations for the Technology Effluents Limitations:

Mass Loading:

Mass of Pollutant (lb/day) = Production (1000 lb/day) X ELG Multiplier (lbs/1000lb)

40 CFR 420.74(C)(1)- Subpart F- Continuous casting subcategory

Daily Maximum

TSS (Max)= 17,750 , 000 (lb/day) X 0.00730 (lb/1000 lb) = 129.57 (lb/day)
O & G(Max)= 17,750 , 000 (lb/day) X 0.00313 (lb/1000 lb) = 15.34 (lb/day)
Lead (Max) = 17,750 , 000 (lb/day) X 0.0000939 (lb/1000 lb) = 0.56 (lb/day)
Zinc (Max) = 17,750 , 000 (lb/day) X 0.000141 (lb/1000 lb) = 0.83 (lb/day)

Monthly Average

TSS (Avg)= 17,750 , 000 (lb/day) X 0.00261 (lb/1000 lb) = 46.33 (lb/day)
O & G(Avg)= 17,750 , 000 (lb/day) X 0.00104 (lb/1000 lb) = 15.34 (lb/day)
Lead (Avg) = 17,750 , 000 (lb/day) X 0.0000313 (lb/1000 lb) = 0.56 (lb/day)
Zinc (Avg) = 17,750 , 000 (lb/day) X 0.0000469 (lb/1000 lb) = 0.83 (lb/day)

40 CFR 420.74(C)(1)- Subpart G-Hot forming subcategory.

Daily Maximum

TSS (Max)= 17,750 , 000 (lb/day) X 0.0435 (lb/1000 lb) = 772.80 (lb/day)
O & G(Max)= 17,750 , 000 (lb/day) X 0.00545 (lb/1000 lb) = 193.46 (lb/day)

Monthly Average

TSS (Avg)= 17,750 , 000 (lb/day) X 0.0163 (lb/1000 lb) = 289.32 (lb/day)
O & G(Avg)= 17,750 , 000 (lb/day) X 0.0109 (lb/1000 lb) = 96.74* (lb/day)

* In absence of the Monthly Average multiplier for Oil & Grease, 1/2 of the Max. Daily multiplier (0.0109 / 2 = 0.00545) limit has been used.

40 CFR 420.94(b)(2)- Subpart I-Hydrochloric acid pickling effluent limitations

Daily Maximum

TSS (Max)= 6,543,000 (lb/day) X 0.0117 (lb/1000 lb) = 76.55 (lb/day)
O & G(Max)= 6,543,000 (lb/day) X 0.00501 (lb/1000 lb) = 32.78 (lb/day)
Lead (Max) = 6,543,000 (lb/day) X 0.0000751 (lb/1000 lb) = 0.49 (lb/day)
Zinc (Max) = 6,543,000 (lb/day) X 0.00010 (lb/1000 lb) = 0.65 (lb/day)

Monthly Average

TSS (Avg)= 6,543,000 (lb/day) X 0.00501 (lb/1000 lb) = 32.78 (lb/day)
O & G(Avg)= 6,543,000 (lb/day) X 0.00167 (lb/1000 lb) = 10.92 (lb/day)
Lead (Avg) = 6,543,000 (lb/day) X 0.0000250 (lb/1000 lb) = 0.16 (lb/day)
Zinc (Avg) = 6,543,000 (lb/day) X 0.0000334 (lb/1000 lb) = 0.22 (lb/day)

40 CFR 420.104(a)(1)-Subpart J-Cold rolling mills. Recirculation-single stand

Daily Maximum

TSS (Max)= 5,990,000 (lb/day) X 0.00125 (lb/1000 lb) = 7.49 (lb/day)
O & G(Max)= 5,990,000 (lb/day) X 0.000522 (lb/1000 lb) = 3.13 (lb/day)
Chromium (Max) = 5,990,000 (lb/day) X 0.0000209 (lb/1000 lb) = 0.125 (lb/day)
Lead (Max) = 5,990,000 (lb/day) X 0.00000940 (lb/1000 lb) = 0.056 (lb/day)
Nickel (Max) = 5,990,000 (lb/day) X 0.0000188 (lb/1000 lb) = 0.113 (lb/day)
Zinc (Max) = 5,990,000 (lb/day) X 0.00000630 (lb/1000 lb) = 0.038 (lb/day)

Monthly Average

TSS (Avg)= 5,990,000 (lb/day) X 0.000626 (lb/1000 lb) = 3.75 (lb/day)
O & G(Avg)= 5,990,000 (lb/day) X 0.000209 (lb/1000 lb) = 1.25 (lb/day)
Chromium (Avg) = 5,990,000 (lb/day) X 0.0000084 (lb/1000 lb) = 0.0503 (lb/day)
Lead (Avg) = 5,990,000 (lb/day) X 0.00000310 (lb/1000 lb) = 0.0185 (lb/day)
Nickel (Avg) = 5,990,000 (lb/day) X 0.0000063 (lb/1000 lb) = 0.0377 (lb/day)
Zinc (Avg) = 5,990,000 (lb/day) X 0.00000210 (lb/1000 lb) = 0.0126 (lb/day)

40 CFR 420.114(a)- Subpart K – Alkaline cleaning - Batch and continuous

Daily Maximum

TSS (Max)= 1,377,000 (lb/day) X 0.0146 (lb/1000 lb) = 20.01 (lb/day)
O & G(Max)= 1,377,000 (lb/day) X 0.00626 (lb/1000 lb) = 8.62 (lb/day)

Monthly Average

TSS (Avg)= 1,377,000 (lb/day) X 0.00626 (lb/1000 lb) = 8.62 (lb/day)
O & G(Avg)= 1,377,000 (lb/day) X 0.00209 (lb/1000 lb) = 2.88 (lb/day)

40 CFR 420.124(a)(1)-Subpart L-Galvanizing Operations

Daily Maximum

TSS (Max)= 3,769,000 (lb/day) X 0.0438 (lb/1000 lb) = 165.08 (lb/day)
O & G(Max)= 3,769,000 (lb/day) X 0.0188 (lb/1000 lb) = 70.35 (lb/day)
Lead (Max) = 3,769,000 (lb/day) X 0.000282 (lb/1000 lb) = 1.0628 (lb/day)
Zinc (Max) = 3,769,000 (lb/day) X 0.000376 (lb/1000 lb) = 1.417 (lb/day)

Monthly Average

TSS (Avg)= 3,769,000 (lb/day) X 0.0188 (lb/1000 lb) = 70.86 (lb/day)
O & G(Avg)= 3,769,000 (lb/day) X 0.00626 (lb/1000 lb) = 23.59 (lb/day)
Lead (Avg) = 3,769,000 (lb/day) X 0.0000939 (lb/1000 lb) = 0.3539 (lb/day)
Zinc (Avg) = 3,769,000 (lb/day) X 0.000125 (lb/1000 lb) = 0.4711 (lb/day)

Combined Technology Based Effluent Limitations

Concentration (mg/l) = mass loading (lbs/day) divided by the long term average flow (0.446MGD) and appropriate conversion factor (8.34).

Daily Maximum Limits

TSS (Total Mass) = 129.57+772.13+76.55+7.49+20.1+165.08 = 1170.92 (lb/day)

TSS (Concentration) = 1170.92 (lb/day)/ 0.446 (mgd) X 8.34 = 315 (mg/l)

O&G (Total Mass) = 55.55+193.46+32.78+3.13+8.62 +70.86 = 364.39 (lb/day)

O&G (Concentration) = 364.39 (lb/day)/ 0.446(mgd) X 8.34 = 98 (mg/l)

Lead (Total Mass) = 1.67+0.49+0.49+0.056+1.0628 = 3.28 (lb/day)

Lead (Concentration) = 3.28 (lb/day)/ 0.446(mgd) X 8.34 = 0.881 (mg/l) = 881 (µg/l)

Nickel (Total Mass) = 0.113 (lb/day)

Nickel (Concentration) = 0.113 (lb/day)/ 0.446(mgd) X 8.34 = 0.03 (mg/l) = 30 (µg/l)

Chromium (Total Mass) = 0.125 (lb/day)

Chromium (Concentration) = 0.125 (lb/day)/ 0.446(mgd) X 8.34 = 0.034 (mg/l) = 34 (µg/l)

Zinc (Total Mass) = 2.50+0.65+0.038+1.417= 4.61 (lb/day)

Zinc (Concentration) = 4.61 (lb/day)/ 0.446(mgd) X 8.34 = 1.238 (mg/l) = 1238 (µg/l)

Monthly Average Limits

TSS (Total Mass) =46.33+289.13+32.75 +3.75+8.62+70.86= 451.66 (lb/day)

TSS (Concentration) = 451.66 (lb/day)/ 0.446 (mgd) X 8.34 = 121 (mg/l)

O&G (Total Mass) = 18.46 +96.74+10.92+1.25+2.88+23.59 = 153.84 (lb/day)

O&G (Concentration) = 153.84 (lb/day)/ 0.446 (mgd) X 8.34 = 41 (mg/l)

Lead (Total Mass) = 0.56+0.160+0.0503+0.3539= 1.424 (lb/day)

Lead (Concentration) = 1.424 (lb/day)/ 0.446 (mgd) X 8.34 = 0.383 (mg/l) = 383 (µg/l)

Nickel (Total Mass) = 0.0377 (lb/day)

Nickel (Concentration) = 0.0377 (lb/day)/ 0.446 (mgd) X 8.34 =0.010 (mg/l) = 10 (µg/l)

Chromium (Total Mass) = 0.0503 (lb/day)

Chromium (Concentration) = 0.0503 (lb/day)/ 0.446 (mgd) X 8.34 = 0.01353 (mg/l) =14 (µg/l)

Zinc (Total Mass) = 0.83+0.22+0.0126+0.4711= 1.53 (lb/day)

Zinc (Concentration) = 1.53 (lb/day)/ 0.446 (mgd) X 8.34 = 0.412 (mg/l) =412 (µg/l)
