

# ADEQ

ARKANSAS  
Department of Environmental Quality

August 28, 2008

Hugh Harrison  
General Manager  
Clarksville Light & Water Co.  
P.O. Box 1807  
Clarksville, Arkansas 72830

NPDES PERMIT FILE

NPDES # AR0033766

AFIN # 36-00038

Permit PN

Correspondence  
 Technical Backup

9/5/08 VH Date Scanned

Re: City of Clarksville Maximum Allowable Headworks Loadings and Water Quality Levels not to be Exceeded - Guidance (NPDES #AR0033766; AFIN# 36-00038)

Dear Mr. Harrison:

Please find enclosed the final excel spreadsheet (Page 1) indicating your POTW's maximum allowable headworks concentrations and industrial loadings (MAHCs and MAILs) and water quality (WQ) "levels not to exceed". These are highlighted in the grey columns.

It's indicated your site specific calculated MAHCs have been exceeded for mercury (Hg) and molybdenum (Mo). A review of your influent data since March, 2001 indicates your Hg MAHC has been exceeded three (3) times out of thirty (30) sampling events and could be attributed to sampling contamination. Clean sampling techniques should be used by your sampling staff and instructions to your lab needs to be emphasized: "avoid sample dilution".

Molybdenum influent data shows your calculated MAHC was exceeded eleven (11) out of fifteen (15) times monitored since the end of January of 2003. Recent correspondence with your pretreatment staff indicates there has been no problem meeting the 40 CFR 503 Table I "guideline limits" for Mo reviewing land application data back to '04 (better than a 75% safety factor).

This could be due to your influent and domestic background analysis not being conducted with sensitive enough methodologies (until your 5/08 submitted reports). The indicated domestic loading erroneously depleted your allocation of Mo. The more sensitive method for this parameter should be considered in any future influent/effluent and domestic analysis.

Reviewing your effluent data, one will notice there have been no excursions of WQ "levels not to exceed", even with the 15% safety factor. This office would agree with your Pretreatment staff, Local Limits are not necessary at this time.

This spreadsheet is the culmination of several other inter-related spreadsheets (also attached) that take into account your city's site specific data for influent, effluent (from the last two [2] annual reports thru 10/07), domestic background and removal efficiencies. If you wish to discuss these spreadsheets, please feel free to contact this office.

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

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You may accept these spreadsheet calculations as guidance, accurate and valid and incorporate them into your Pretreatment Program section dealing with "Local Limits Evaluation". This office used your site specific data, EPA guidance material and best professional judgment.

Or, you may hire a consultant to calculate these numbers separately and submit a certification statement that a technical evaluation has demonstrated that the existing technically based local limits (TBLL) are based on current state water quality standards and are adequate to prevent pass through of pollutants, inhibition of or interference with the treatment works, worker health and safety problems, and sludge contamination.

Also enclosed is a copy of your influent/effluent summary sheet which reflects the above calculated numbers. Copies of this sheet (should you accept this office's MAHLs, MAILs and WQ levels) should be made for subsequent years' annual reports.

Various assumptions were made regarding removal efficiencies because of the influent/effluent non-detect values reported. These are footnoted by "\*" at the bottom of the "Removal efficiency Calcs." spreadsheet. Other assumptions were made regarding domestic background analysis for the same reason. EPA's "Guidance Manual on the Development and Implementation of Local Discharge Limits" ('87 & '04) was followed.

As stated earlier, it appears local limits are not necessary for any of EPA's suggested pollutants of concern. Through your quarterly monitoring, you should be capable of determining if either your MAHCs or WQ levels are in danger of being exceeded. If this is the case in the future, local limits should be allocated from the MAILs and implemented through your system of industrial permitting.

Feel free to contact this office with any questions.

Sincerely,



Allen R. Gilliam  
ADEQ State Pretreatment Coordinator

Attachments: Four (4) Excel Spreadsheets & a revised Inf/Eff Summary Sheet (for your Annual Reports)

Pollutant	% Rem***	Water Quality mg/l	Water Quality lbs/day	Sludge mg/kg	Sludge lbs/day	Inhibition** mg/l	Inhibition** lbs/day	MAHL lbs/day	MAHC mg/l	Domestic Allocation for %SF lbs/day	Allocation for %SF lbs/day^A	MAIL lbs/day	Max Inf Exceedec MAHC	Max Effluent vs WQS(mg/l)
Cadmium Total	67	0.0053	0.1870	85	0.06	1.00	11.68	0.062	0.00535	0.03	0.053	0.0236	No	No
Copper Total	71	0.0457	1.8418	4300	2.98	1.00	11.68	1.842	0.15775	0.31	1.566	1.2506	No	No
Lead Total	61	0.0200	0.6001	840	0.68	1.00	11.68	0.600	0.05140	0.32	0.510	0.1951	No	No
Mercury Total	95	0.000013	0.0031	57	0.03	0.10	1.17	0.003	0.00027	0.0019	0.003	0.0007	0.0006	No
Nickel Total	42	0.5141	10.3493	420	0.49	1.00	11.68	0.492	0.04214	0.21	0.418	0.2099	No	No
Selenium Total	50	0.0056	0.1303	100	0.10	0.20	2.34	0.098	0.00843	0.12	0.084	0.0000	No	No
Silver Total	75	0.0144	0.6744	0	0.00	0.25	2.92	0.674	0.05776	0.13	0.573	0.4414	No	No
Zinc Total	54	0.4440	11.2689	7500	6.83	0.50	5.84	5.838	0.50000	1.46	4.962	3.5010	No	No
Chromium Total	82	1.1920	77.3241	3000	1.80	1.00	11.68	1.800	0.15416	0.36	1.530	1.1660	No	No
Cyanide Total	69	0.0058	0.2186	0	0.00	0.10	1.17	0.219	0.01872	0.04	0.186	0.1475	No	No
Arsenic	45	0.4111	8.7278	75	0.08	0.10	1.17	0.082	0.00702	0.03	0.070	0.0416	No	No
Molybdenum	39	0.0000	0.0000	75	0.09	0.20	2.34	0.095	0.00810	0.09	0.080	0.0000	0.0290	No
Beryllium	50	0.005915	0.1381	0	0.00	0.10	1.17	0.1381	0.01183	0.00	0.117	0.1168	No	No

Dry tons/day of sludge 0.246 Safety Factor 0.15  
 (avg from '03 thru '07)

\* lbs/day = mg/l \* 8.34 \* average flow / (1-%Rem)

\*\* Page 3-44 of EPA Guidance Mtrl. (Be est. @ 0.10 mg/l)

\*\*\* EPA Default Numbers from page 3-56 of TBLL guidance manual except for Cd, Cu, Ag, Zn & Mo. (Be est. @ 50%; Hg est. @ 95%)

\*\*\*\* lbs/day = dry tons/day \* 0.002 \* CFR 503 criteria/ % removal from EPA Pret. Prog. Implementation workshop mtrl. - 6/93

++ lbs/day = mg/l \* Flow \* 8.34

^ lbs/day = (1 - SF) \* MAHL

MAIL = Maximum allowable industrial loading = MAHL - Allocation for % SF - Domestic lb/day

**CALCULATIONS OF ARKANSAS WATER QUALITY-BASED EFFLUENT LIMITATIONS**

**For an Arkansas River/Stream**

**(Reserved)**

**AV**

**St. Francis**

STEP 1: INPUT TWO LETTER CODE FOR ECOREGION (Use Code at Right)  
Basin Name

**FACILITY**

Permittee & Date	Clarksville 8/08
NPDES Permit No.	AR0022187
Outfall No (s)	1.00
Plant Ave Flow (MGD)	1.40
Silus Ave Flow (MGD)	0.05
Domestic Flow (MGD)	1.35
Plant Design Flow (MGD)	2.00
Plant Design Flow (cfs)	3.09

**RECEIVING STREAM**

Is this a large river? (see list at right)(enter "1" if yes, "0" if no, make entry as a number)	0
Name of Receiving Stream	Lake Dardanelle
Waterbody Segment Code No	3H
Is this a lake or reservoir? (enter '1' if yes, '0' if no; make entry as a number)	0
Is seasonal critical flow applicable (1=yes, 0=no); see Reg 2 page 1-3 for details	0
(Reserved) DO NOT INPUT DATA INTO CELL H22, H23 & H24 . . LEAVE BLANK	
(Reserved)	
(Reserved)	?
(Reserved)	?
(Reserved)	?
(Reserved)	?
Ecoregion TSS (mg/l) (For Large River. See List to Right)	12.00
Ecoregion Hardness (mg/l)	125.00
Enter 7Q10 (cfs)	0.00
Long Term Ave / Harmonic Mean Flow (cfs)	0.00
Using Diffusers (Yes/No)	No
pH (Avg)	6.90
Percent (%) of 7Q10 for Chronic Criteria	0.67
Percent (%) of 7Q10 for Acute Criteria	0.33
Water Effect Ratio (WER)	1.00
EPA Statistical Factor for Data (enter 2 13 for <20; enter 1 for >20)	2 13
Ave Monthly Limit LTA Multiplier (Ref. page 103 TSD for WQ-Based Toxics Control)	1 55
Max Daily Limit LTA Multiplier (Ref. )	3 11

**Codes & TSS for Ecoregions and Large Rivers**

Ouachita Mts Eco (OM) =	2.0 mg/l	Arkansas (Fl Smith to Dardanelle Dan)	12.0 mg/l
Ozark Highlands Eco (OH) =	2.5 mg/l	Arkansas (Dardanelle Dam to Terry L&	10.5 mg/l
Boston Mts Eco (BM) =	1.3 mg/l	Arkansas (Terry L&D to L&D No. 5)	8.3 mg/l
Ark River Valley Eco (AV) =	3.0 mg/l	Arkansas (L&D No. 5 to Mouth)	9.0 mg/l
Gulf Coastal Eco (GC) =	5.5 mg/l	White (Above Beaver Lake)	2.5 mg/l
Delta Ecoregion (DL) =	8.0 mg/l	White (Below Bull Shoals to Black Riv)	3.3 mg/l
		White (From Black River to Mouth)	18.5 mg/l
		St. Francis River	18.0 mg/l
		Ouachita (Above Caddo River)	2.0 mg/l
		Ouachita (Below Caddo River)	5.5 mg/l
		Red River	33.0 mg/l
<b>Total Hardness for:</b>			
Arkansas River =	125 mg/l	Red River =	211 mg/l
Ouachita River =	28 mg/l	St. Francis River =	103 mg/l
White River =	116 mg/l		
Gulf Coastal =	31 mg/l	Ouachita Mount =	31 mg/l
Ozark Highlands =	148 mg/l	Ark River Valley =	25 mg/l
Boston Mount =	25 mg/l	Delta =	81 mg/l
<b>Large Rivers</b>			
Mississippi River, Arkansas River, Red River			
White (Below confluence with Black River)			
Ouachita (Below confluence with Little Miss. River)			

**Clarksville 8/08** Removal Efficiency Calcs.

*Influent (mg/l) No data entered = Non-detects @ MQL*

Date	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc	Chromium	Cyanide	Arsenic	Molydenur	Beryllium
1/12/2006		0.04400					0.00900	0.17000					
4/25/2006		0.06200						0.16000				0.01100	
7/17/2006		0.04300		0.00064		0.00300		0.26000					
10/17/2006		0.01700		0.00045				0.06100					
1/29/2007		0.01800						0.07900					
4/17/2007		0.03100						0.11000					
7/10/2007		0.04200				0.00290		0.09800				0.02900	
10/23/2007		0.03300					0.00850	0.11000					

Quantitation Level (QL)	0.0005	0.0005	0.0005	0.000005	0.0005	0.0050	0.0005	0.0200	0.0100	0.0100	0.0005	0.0100	0.0005
Average	#DIV/0!	0.03625	#DIV/0!	0.00055	#DIV/0!	0.00295	0.00875	0.13100	#DIV/0!	#DIV/0!	#DIV/0!	0.02000	#DIV/0!
Maximum	0.0000	0.0620	0.0000	0.0006	0.0000	0.0030	0.0090	0.2600	0.0000	0.0000	0.0000	0.0290	0.0000
All Concs > QL (Yes/No)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Effluent (mg/l) No data entered = Non-detects @ MQL*

Date	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc	Chromium	Cyanide	Arsenic	Molydenur	Beryllium
1/13/2006		0.01100						0.10000					
4/26/2006		0.02100						0.08400				0.01800	
7/18/2006		0.01000				0.00270		0.05300				0.01000	
10/18/2006		0.00000						0.04100	0.03100				
1/30/2007		0.00690						0.04800					
4/18/2007		0.00910						0.05900				0.01000	
7/12/2007		0.01300		0.00029				0.05500			0.00130	0.01100	
10/23/2007		0.01200						0.03700					

Quantitation Level (QL)	0.0005	0.0005	0.0005	0.000005	0.0005	0.0050	0.0005	0.0200	0.0100	0.0100	0.0005	0.0100	0.0005
Average	#DIV/0!	0.01038	#DIV/0!	0.00029	#DIV/0!	0.00270	#DIV/0!	0.05963	0.03100	#DIV/0!	0.00130	0.01225	#DIV/0!
Maximum	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
All Concs > QL (Yes/No)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Average % Removal rat:	#DIV/0!	71	#DIV/0!	47	#DIV/0!	8	#DIV/0!	54	#DIV/0!	#DIV/0!	#DIV/0!	39	#DIV/0!
EPA % REM	67	86	61	60	42	50	75	79	82	69	45	50	50
* use EPA default #s	.	.	.	.(95%)	.	.	.	.	.	.	.	.	.
Geometric Mean*	#NUM!	#NUM!	#NUM!	0.00	#NUM!	0.00	#NUM!	0.06	0.03	#NUM!	0.00	0.01	#NUM!

\*Geometric Mean. The range in the geometric mean cannot contain a "zero" value; if less than 30 values are entered in each column the user must either enter one-half the detection level or change the range of the geometric mean. The range of the geometric mean can be changed by specifying which rows have data (for example, B42:B62 has 20 data points)

**Domestic Calculations for Clarksville 8/08**

Pollutants	EPA, P3-59* mg/l	Avg Reported mg/l	Loading lbs/day	
Cadmium Total	0.0030	0.00262	0.029	city data from '00 thru '04 using ND numbers at 1/2 ND
Copper Total	0.0607	0.02797	0.315	city data from '00 thru '04 using ND numbers at 1/2 ND
Lead Total	0.0490	0.02798	0.315	city data from '00 thru '04 using ND numbers at 1/2 ND
Mercury Total	0.0003	0.00017	0.002	city data from '00 thru '04 using ND numbers at 1/2 ND
Nickel Total	0.0210	0.01850	0.208	city data from '00 thru '04 using ND numbers at 1/2 ND
Selenium Total	-	0.01045	0.118	city data from '00 thru '08 using ND numbers at 1/2 ND
Silver Total	0.0050	0.01171	0.132	city data from '00 thru '04 using ND numbers at 1/2 ND
Zinc Total	0.1750	0.12979	1.461	city data from '00 thru '04 using ND numbers at 1/2 ND
Chromium Total	0.0500	0.03233	0.364	city data from '00 thru '04 using ND numbers at 1/2 ND
Cyanide Total	0.0410	0.00340	0.038	city data from '00 thru '04 using ND numbers at 1/2 ND
Arsenic	0.0030	0.00250	0.028	city data from '00 thru '04 using ND numbers at 1/2 ND
Molybdenum	999999.0000	0.00794	0.089	city data from '00 thru '08 using ND numbers at 1/2 ND
Beryllium	999999.00	0.00005	0.001	used new EPA MQL

Date	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc	Chromium	Cyanide	Arsenic	Molybdenum	Beryllium
10/26/01		0.01700	0.00150				0.00050	0.07300					
11/16/01		0.07100	0.00150				0.01400	0.09700					
11/13/01		0.00500	0.00150				0.04000	0.16500					
11/13/01		0.00500	0.00300				0.03200	0.09100					
11/13/01		0.00500	0.00150				0.03600	0.14500					
11/16/01		0.02400	0.00700				0.00250	0.10800					
11/20/01		0.03800	0.00150				0.00250	0.14400					
11/20/01		0.03100	0.00150				0.00250	0.09800					
10/17/02								0.01000					
10/17/02								0.01000					
10/17/02								0.01800					
11/4/02	0.00050	0.11900	0.02000	0.00010	0.00500	0.00050	0.03800	0.49000	0.00500				
11/13/02	0.00050	0.00500	0.02000	0.00034	0.00500	0.00100	0.02900	0.06700	0.00500				
11/13/02	0.00050	0.00500	0.02000	0.00010	0.00500	0.00050	0.02200	0.04400	0.00500				
11/14/02	0.00200	0.02700	0.02000	0.00010	0.02000	0.03500	0.00350	0.06300	0.00350				
11/20/02	0.00200	0.04900	0.02000	0.00010	0.00500	0.03500	0.00350	0.09200	0.00350				
11/21/02	0.00200	0.04300	0.02000	0.00041	0.00500	0.03500	0.01500	0.11300	0.00350				
11/21/02	0.02000	0.04900	0.02000	0.00010	0.00500	0.03500	0.00350	0.06300	0.00350				
12/2/02	0.00050	0.00500	0.01000	0.00010	0.03400	0.00100	0.00350	0.09400	0.11400				
12/2/02	0.00050	0.00500	0.01000	0.00010	0.03400	0.00050	0.00350	0.19400	0.10600				
12/3/02	0.00050	0.00500	0.01000	0.00048	0.09400	0.00100	0.00350	0.74000	0.13400				
5/22/03		0.08000	0.16500			0.02200	0.00350	0.15100					
5/27/04		0.01200	0.25500	0.00020		0.02200	0.00800	0.07900					
5/29/03		0.02700	0.01300	0.00010		0.02200	0.00350	0.10400					
4/22/04	0.00400	0.02200	0.03300	0.00010			0.00800	0.16300				0.02100	
11/1/00	0.00050	0.00700	0.00150	0.00010	0.00500	0.00250	0.00250	0.02800	0.00250	0.00430	0.00250	0.02500	
12/1/00	0.00050	0.01530	0.01500	0.00010	0.00500	0.00250	0.00050	0.06030	0.00250	0.00250	0.00250	0.02500	
5/28/08						0.00044						0.00001	
5/28/08						0.00044						0.00001	
5/28/08						0.00178						0.00040	
5/28/08						0.00044						0.00001	
5/28/08						0.00044						0.00001	
5/28/08						0.00044						0.00001	
Quantitation Level (QL)	0.0005	0.0005	0.0005	0.000005	0.0005	0.0050	0.0005	0.0200	0.0100	0.0100	0.0005	0.0100	0.0005
Average	0.00262	0.02797	0.02798	0.00017	0.01850	0.01045	0.01171	0.12979	0.03233	0.00340	0.00250	0.00794	#DIV/0!
Maximum	0.0200	0.1190	0.2550	0.0005	0.0940	0.0350	0.0400	0.7400	0.1340	0.0043	0.0025	0.0250	0.0000
All Concs > QL (Yes/No)	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes

\*EPA Default Numbers from guidance document



- (1) It is advised that the influent and effluent samples are collected considering flow detention time through each plant. **Analytical MQLs must be met for the effluent (and SHOULD be met for the influent) so the data can also be used for Local Limits assessment and NPDES application purposes.**
- (2) This value was calculated during the development of TBLL based on State WQ criteria, EPA guidance and ADEQ Pretreatment staff Excel spreadsheets.
- (3) Record the name of any pollutant [40 CFR 122, Appendix D, Table II and/or Table V] detected and the quantity at which they were detected.

MAHL - Maximum Allowable Headworks Level

WQ - "Water Quality Levels not to exceed" OR actual permit limit.