

# ADEQ

ARKANSAS  
Department of Environmental Quality

September 26, 2008

Randy Easley, Env Mgr  
Fort Smith Utility Department  
3900 Kelly Highway  
Fort Smith, Arkansas 72904

Re: AFIN 66-00226 AR0021750 City of Fort Smith Maximum Allowable Headworks Concentrations and Water Quality Levels not to be Exceeded - Guidance

Dear Mr. Easley:

Please find enclosed the final excel spreadsheets indicating your POTW's maximum allowable headworks concentrations and water quality (WQS) standards not to be exceeded. These are highlighted in the grey columns on the "Ft Sm Massard MAHC" and "Ft Sm P St MAHC" worksheets.

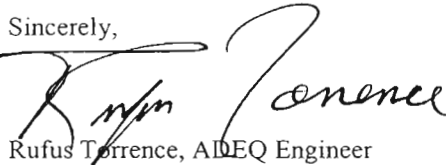
This spreadsheet is the culmination of several other spreadsheets (also attached) that take into account your city's site specific data for influent, effluent (from the last two annual reports thru 09/07), domestic background and removal efficiencies. If you wish to discuss these spreadsheets, please feel free to contact this office.

To confirm the existing technically based local limits (TBLL submittal)<sup>1</sup> are adequate to prevent pass through of pollutants, inhibition of or interference with the treatment works, worker health and safety problems, and sludge contamination, you may (1) accept these spreadsheet calculations as guidance, accurate and valid, (2) perform your own investigation, or (3) hire a consultant engineer. The current uniform concentration limits<sup>2</sup> appear to be adequate to prevent pass through. Therefore, the City of Fort Smith may submit a WRITTEN CERTIFICATION that a technical evaluation has demonstrated the existing TBLL are based on current water quality standards and are adequate to prevent pass through. Nonetheless, the submittal contains information on domestic levels that are over five years old. The City should analyze the current domestic background levels of all pollutants of concern (POCs, the 14 metals and Cyanide) to verify that the levels<sup>3</sup> shown in the submittal are still representative of current domestic levels.

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 MAHCs and WQS) should be made for subsequent years' annual reports. Various assumptions were made regarding removal efficiencies because of all the influent/effluent non-detect values reported. These are footnoted by "\*\*\*\*" on the excel spreadsheet.

Feel free to contact this office with any questions.

Sincerely,



Rufus Torrence, ADEQ Engineer

Attachments:

Cc: Cindy Garner, ADEQ Enforcement  
Eric Fleming, ADEQ Inspection

<sup>1</sup> "Technically Based Local Limits Development Submittal City of Fort Smith, AR. May 8, 1995"

<sup>2</sup> Table 17 and 18 Limits Comparisons on page 18 in submittal

<sup>3</sup> Table 13 Domestic Background Levels on page 13 in submittal

NPDES PERMIT FILE  
NPDES # AR0021750  
AFIN # 66-00226  
Permit PN  
 Correspondence  
 Technical Backup  
9/29/08 ML Date Scanned



- (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. THE METHODS SHOWN ARE OPTIONAL; ANY METHOD WHICH MEETS THE MQL MAY BE USED.**
- (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.

MAHC - Maximum Allowable Headworks Concentration

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



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**Ft Sm Massard MAHC**

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	MAHC lbs/day	MAIL lbs/day	Max Inf Exceedec MAHC	Max Effluent vs WQS(mg/l)
Cadmium Total	67	0.0603	12.6738	85	1.55	1.00	69.31	1.5488	0.02235	0.20	0.966	0.966	No	No
Copper Total	93	0.2059	203.8267	4300	56.45	1.00	69.31	56.4466	0.81446	1.30	41.030	41.030	No	No
Lead Total	66	0.2471	50.3670	840	15.54	1.00	69.31	15.5377	0.22419	2.61	9.044	9.044	0.2900	No
Mercury Total	84	0.00017	0.0715	57	0.83	0.10	6.93	0.0715	0.00103	0.0130	0.041	0.041	0.0017	0.0002
Nickel Total	42	6.3372	757.2455	420	12.21	1.00	69.31	12.21	0.17615	0.65	8.504	8.504	No	No
Selenium Total	50	0.0657	9.1074	100	2.442	0.20	13.86	2.442	0.03523	0.13	1.701	1.701	No	No
Silver Total	75	0.0537	14.8860	0	0.00	0.25	17.33	14.8860	0.21479	0.46	10.708	10.708	No	No
Zinc Total	91	1.6508	1271.2487	7500	100.62	4.500	311.87	100.6172	1.45179	3.98	71.483	71.483	4.5000	No
Chromium Total	62	10.8176	1972.9387	3000	59.07	1.00	69.31	59.07	0.85234	0.46	43.847	43.847	No	No
Cyanide Total	69	0.0715	15.9928	0	0.00	0.23	15.94	15.9402	0.23000	0.33	11.629	11.629	No	No
Arsenic	45	2.2931	288.9554	75	2.03	0.10	6.931	2.035	0.02936	0.26	1.265	1.265	No	No
Molybdenum	50	0.0000	0.0000	75	1.831	0.20	13.86	1.831	0.02642	0.52	0.852	0.852	No	No
Beryllium	50	0.072911	10.1062	0	0.00	0.10	6.93	6.9305	0.10000	0.02	5.178	5.178	No	No

Dry tons/day of sludge \*\*\*\*  Safety Factor

\* lbs/day = mg/l \* 8.34 \* average flow / (1-%Rem)  
 \*\* Page 3-44 of EPA 833B87202 Be est @ 0.10 mg/l; Zinc (4.5 mg/l) and CN (0.23 mg/l) from Sept 06 Annual Report  
 + lbs/day = (dry tons/day \* 0.002 \* critria(mg/kg)) / % Rem  
 ++ lbs/day = mg/l \* Flow \* 8.34  
 ^ lbs/day = (1 - SF) \* MAHL  
 MAIL = Maximum allowable industrial loading = Allocation for % SF - Domestic  
 \*\*\*Rem Eff from Page 3-56 EPA 833B87202, Be & Mo est @ 50, Cr,Cu,Pb,Hg & Zn from "Rem" spreadsheet in this Workbook  
 \*\*\*\* Dry tons/day of sludge based on Sept 2004 Audit report showing 2228 dry tons/year or 2228/365 = 6.1 dt/day

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

For an Arkansas River/Stream

(Reserved)

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

Basin Name

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

**FACILITY**

Permittee	Ft Sm Massard	Ouachita Mts. Eco (OM) =	2.0 mg/l	Arkansas (Ft. Smith to Dardanelle Dam	12.0 mg/l
NPDES Permit No.	AR0021750	Ozark Highlands Eco (OH) =	2.5 mg/l	Arkansas (Dardanelle Dam to Terry L&	10.5 mg/l
Outfall No.(s)	001	Boston Mts. Eco (BM) =	1.3 mg/l	Arkansas (Terry L&D to L&D No. 5)	8.3 mg/l
Plant Ave Flow (MGD)	8.31	Ark River Valley Eco (AV) =	3.0 mg/l	Arkansas (L&D No. 5 to Mouth)	9.0 mg/l
SIUs Ave Flow (MGD)	0.49				
Domestic Flow (MGD)	7.82				
Plant Design Flow (MGD)	10.00	Gulf Coastal Eco (GC) =	5.5 mg/l	White (Above Beaver Lake)	2.5 mg/l
Plant Design Flow (cfs)	15.45	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

**RECEIVING STREAM**

Is this a large river? (see list at right)(enter "1" if yes, "0" if no; make entry as a number)

Name of Receiving Stream: Ark River 1

Waterbody Segment Code No. 3H

Is this a lake or reservoir? (enter '1' if yes, '0' = 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 H25, H26 & H27....LEAVE BLANK ?

(Reserved) ?

(Reserved) ?

(Reserved) (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) (Reserved) 700.00 (Reserved)

Long Term Ave / Harmonic Mean Flow (cfs) 2100.00 (Reserved (Reserved))

Using Diffusers (Yes/No) No

pH (Avg) 7.45

Percent (%) of 7Q10 for Chronic Criteria 0.25

Percent (%) of 7Q10 for Acute Criteria 0.06

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

**Total Hardness for:**

Arkansas River = 125 mg/l  
 Ouachita River = 28 mg/l  
 White River = 116 mg/l  
 Red River = 211 mg/l  
 St. Francis River = 103 mg/l

Gulf Coastal = 31 mg/l  
 Ozark Highlands = 148 mg/l  
 Boston Mount = 25 mg/l  
 Ouachita Mount = 31 mg/l  
 Ark River Valley = 25 mg/l  
 Delta = 81 mg/l

**Large Rivers**

Mississippi River, Arkansas River, Red River  
 White (Below confluence with Black River)  
 Ouachita (Below confluence with Little Miss. River)

For industrial and federal facility, use the highest monthly average flow for the past 24 months. For POTWs, use the design flow.

#VALUE! => No violation or Not Applicable

**WQ Limits for the Ft Sm Massar**

Aquatic Life  
AML, ug/l

Cadmium Total	60.35
Chromium (hex)	51.62
Copper Total	205.87
Lead Total	247.09
Mercury Total	0.17
Nickel Total	6337.20
Selenium Total	65.70
Silver Total	53.70
Zinc Total	1650.84
Chromium (Tri)	10817.58
Cyanide Total	71.54
Beryllium Total	72.91
Arsenic	2293.12





**Domestic Calculations for Ft Sm Massard**

Pollutants	EPA, P3-59* mg/l	Avg Reported** mg/l	Loading lbs/day
Cadmium Total	0.0030	0.00300	0.20
Copper Total	0.0607	0.02000	1.30
Lead Total	0.0490	0.04000	2.61
Mercury Total	0.0003	0.00020	0.01
Nickel Total	0.0210	0.01000	0.65
Selenium Total	-	0.00200	0.13
Silver Total	0.0050	0.00700	0.46
Zinc Total	0.1750	0.06100	3.98
Chromium Total	0.0500	0.00700	0.46
Cyanide Total	0.0410	0.00500	0.33
Arsenic	0.0030	0.00400	0.26
Molybdenum	999999.0000	0.00800	0.52
Beryllium	999999.00	0.00030	0.02

\*EPA Page 3-59 of 833-B87-202

\*\*Ref: Technically Based Local Limits Development Submittal City of Fort Smith, AR May 8, 1995; Table 13 on page 13 except Beryllium equals MDL (0.0003 mg/l)



**Fl Sm P St MAHC**

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^	MAIL lbs/day	Max Inf Exceedec MAHC	Max Effluent vs WQS(mg/l)
Cadmium Total	67	0.0530	15.9109	85	2.37	1.00	99.08	2.3691	0.02391	0.25	1.78	1.525	No	No
Copper Total	92	0.1808	223.9008	4300	87.28	1.00	99.08	87.2805	0.88092	1.68	65.46	63.782	No	No
Lead Total	61	0.2093	53.1599	840	25.71	1.00	99.08	25.7150	0.25954	3.36	19.29	15.930	No	No
Mercury Total	60	0.00014	0.0346	57	1.77	0.10	9.91	0.0346	0.00035	0.0168	0.0260	0.009	No	No
Nickel Total	42	5.3667	916.7705	420	18.67	1.00	99.08	18.67	0.18848	0.84	14.01	13.166	No	No
Selenium Total	50	0.0577	11.4336	100	3.735	0.20	19.82	3.735	0.03770	0.17	2.80	2.633	No	No
Silver Total	75	0.0472	18.6881	0	0.00	0.25	24.77	18.6881	0.18862	0.59	14.02	13.429	No	No
Zinc Total	91	1.4497	1595.9419	7500	153.91	5.800	574.66	153.9064	1.55337	5.12	115.43	110.312	5.8000	No
Chromium Total	92	9.4995	11765.0497	3000	60.89	1.00	99.08	60.89	0.61459	0.59	45.67	45.083	No	No
Cyanide Total	69	0.0606	19.3620	0	0.00	0.10	9.91	9.9079	0.10000	0.42	7.43	7.011	No	No
Arsenic	45	2.0137	362.7583	75	3.11	0.10	9.908	3.112	0.03141	0.34	2.33	1.999	No	No
Molybdenum	50	0.0000	0.0000	75	2.801	0.20	19.82	2.801	0.02827	0.67	2.10	1.430	No	No
Beryllium	50	0.061745	12.2353	0	0.00	0.10	9.91	9.9079	0.10000	0.03	7.43	7.406	No	No

Dry tons/day of sludge \*\*\*\* 9.34 Safety Factor 0.25

\* lbs/day = mg/l \* 8.34 \* average flow / (1-%Rem)  
 \*\* Inhibitions from Page 3-44 of EPA 833B87202 Be est @ 0.10 mg/l; Zinc (5.8 mg/l) from Sept 06 Annual Report.  
 + lbs/day = (dry tons/day \* 0.002 \* critria(mg/kg)) / % Rem  
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 ^ lbs/day = (1 - SF) \* MAHL  
 MAIL = Maximum allowable industrial loading = Allocation for % SF - Domestic  
 \*\*\*\*Rem Eff from Page 3-56 EPA 833B87202, Be & Mo est @ 50; Cr, Cu and Zn from "Rem" spreadsheet in this Workbook  
 \*\*\*\*\* Dry tons/day of sludge based on Sept 2004 Audit report showing 3408 dry tons/year or 3408/365 = 9.34 dt/day



**WQ Limits for the Ft Sm P St**

Aquatic Life	AML, ug/l
Cadmium Total	52.99
Chromium (hex)	45.33
Copper Total	180.79
Lead Total	209.25
Mercury Total	0.14
Nickel Total	5366.69
Selenium Total	57.70
Silver Total	47.15
Zinc Total	1449.70
Chromium (Tri)	9499.51
Cyanide Total	60.58
Beryllium Total	61.74
Arsenic	2013.71



**Domestic Calculations for Ft. Smith, St**

pollutants	EPA, P3-59* Avg Reported**	mg/l	mg/l	lbs/day
admium Total	0.0030	0.00300	0.25	1.68
opper Total	0.0607	0.02000	1.68	3.36
ead Total	0.0490	0.04000	3.36	0.02
tercury Total	0.0003	0.00020	0.02	0.84
ickel Total	0.0210	0.01000	0.84	0.17
elenium Total	-	0.00200	0.17	0.59
ilver Total	0.0050	0.00700	0.59	0.12
inc Total	0.1750	0.06100	5.12	0.59
hromium Total	0.0500	0.00700	0.59	0.42
yanide Total	0.0410	0.00500	0.42	0.34
rsenic	0.0030	0.00400	0.34	0.67
olybdenum	999999.0000	0.00800	0.67	0.03
eryllium	999999.00	0.00030	0.03	

EPA Page 3-59 of 833-B87-202  
 \*Ref: Technically Based Local Limits Development Submittal City of Fort Smith, AR May 8, 1995; Table 13 on page 13  
 except Beryllium equals MDL (0.0003 mg/l)