ADEQ

ARKANSAS
Department of Environmental Quality

JUN 16 2014

Mark A. Smith, General Manager
El Dorado Water Utilities
P.O. Box 1587
El Dorado, AR 71731

via U.S. Postal Service and e-mail (mark@eldoradowater.com)

RE: NPDES Permit No. AR0050296, AFIN 70-00729 – El Dorado Joint Pipeline Group
NPDES Permit No. AR0000647, AFIN 70-00016 – Lion Oil Company
NPDES Permit No. AR0000752, AFIN 70-00040 – El Dorado Chemical Company
NPDES Permit No. AR0001171, AFIN 70-00012 – Great Lakes Chemical Corporation
NPDES Permit No. AR0049743, AFIN 70-01419 – El Dorado Water Utilities

Dear Mr. Smith:

The Department has received and reviewed the Priority Pollutant Scans (PPS) submitted by Lion Oil Company, El Dorado Chemical Company, Great Lakes Chemical Corporation, and El Dorado Water Utilities as well as the PPS submitted for the El Dorado Joint Pipeline Group. NPDES Permit Nos. AR0000647, AR0000752, AR0001171, and AR0049743 required that a PPS be conducted within 90 days of first discharging to the joint pipeline. NPDES Permit No. AR0050296 required a PPS to be conducted within 90 days of all entities discharging to the pipeline. The required information was submitted 1/3/2014 through 5/2/2014.

A review of the PPS data submitted for the joint pipeline discharge showed that there is not reasonable potential for violations of water quality standards in the Ouachita River. However, a review of the PPS data submitted for the individual facilities showed that the Mercury level reported by Lion Oil Company is above the limit for Outfall 010 in NPDES Permit No. AR0000647. This exceedance has been reported to the Water Division's Enforcement Branch.

The submittal of the PPS fulfills the requirements to do so in Part IB of each of the listed permits. If you have any questions, please contact me at reiber@adeq.state.ar.us or by phone at (501) 682-0612.

Sincerely,

Loretta Reiber

Loretta Reiber, P.E.
Engineer, NPDES Permits

Kim Fuller

Kimberly Fuller, P.E.
Engineer Supervisor, NPDES Permits

Attachments

cc: Gregory Withrow, El Dorado Chemical Company (gwithrow@edcc.com)
Randall Whitmore, Great Lakes Chemical Company (Randall.Whitmore@chemtura.com)
William R. (Chuck) Hammock, Lion Oil Company (Chuck.Hammock@Lionoil.com)
Vince Blubaugh, GBMc & Associates (vblubaugh@gbmcassoc.com)
Craig Uyeda, Enforcement Branch Manager
Richard Healey, Enforcement Coordinator
Leslie Allen-Daniel, Enforcement Analyst
David Ramsey, Environmental Program Coordinator

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) GC

FACILITY

Permittee	Joint Pipeline
NPDES Permit No.	AR0050296
Outfall No.(s)	010
Plant Effluent Flow (MGD)	20.00
Plant Effluent Flow (cfs)	30.90

RECEIVING STREAM

Is this a large river? (see list at right)(enter "1" if yes, "0" if no; make entry as a number)	1
Name of Receiving Stream:	Ouachita River
Is this a lake or reservoir? (enter '1' if yes, ' 0 ' = no; make entry as a number)	0
(Reserved)	0
(Reserved) DO NOT INPUT DATA INTO CELL H22, H23 & H24....LEAVE BLANK	?
(Reserved)	
(Reserved) (Reserved)	(Reserved)
(Reserved)	(Reserved)
(Reserved)	(Reserved)
(Reserved)	(Reserved)
Ecoregion TSS (mg/l) (For Large River, See List to Right)	5.50
Ecoregion Hardness (mg/l) For Large Rivers Ecoregion TSS and Hardness may not apply	31.00
Enter 7Q10 (cfs) as the Critical Flow (Reserved) (Reserved)	750.00 (Reserved
Long Term Ave / Harmonic Mean Flow (cfs)	2250.00 (Reserved (Reserved)
Using Diffusers (Yes/No)	Yes
pH (Avg)	7.00
Percent (%) of Critical Flow for Chronic Criteria	0.25
Percent (%) of Critical Flow for Acute Criteria	0.13
Water Effect Ratio (WER)	1.00
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 (Ft. 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

Total Hardness for:

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

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
9999999.00 => No EPA/ADEQ Guideline

Max Daily Limit LTA Multiplier for Human Health (Ref: 2009 CPP; Section 5.27.2) 1.64

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

DATA INPUT

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

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

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

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

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

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

***Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert to "Total")**

Total Metals	Dissolved Value in Stream	Kpo	alpha (a)	Kp	C/Ct	Total Value
Cadmium		4000000	-1.13	582706.889	0.237818469	0.00
Chromium(3)		3360000	-0.93	688338.365	0.208948818	0.00
Copper		1040000	-0.74	294554.016	0.381672529	0.00
Lead		2800000	-0.8	715925.58	0.202527926	0.00
Mercury		2900000	-1.14	415321.613	0.30448177	0.00
Nickel		490000	-0.57	185433.992	0.495077211	0.00
Zinc		1250000	-0.7	379014.766	0.324193117	0.00
Silver		2400000	-1.03	414607.994	0.30484608	0.00

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

Lake Linear Partition Coefficient

Kpo	alpha (a)	Kp	C/Ct	Total Value
3520000.00	-0.92	733514.98	0.1986361	0
2170000.00	-0.27	1369499.28	0.1172024	0
2850000.00	-0.9	614495.12	0.2283249	0
2040000.00	-0.53	826490.64	0.1803199	0
1970000.00	-1.17	268066.09	0.4041443	0
2210000.00	-0.76	604946.03	0.2310962	0
3340000.00	-0.68	1047851.74	0.1478593	0
2400000.00	-1.03	414607.99	0.3048461	0

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

	MQLs, µg/L	EDWU - North	EDWU - South	EDCC	GLCC	Lion Oil Company	Joint Permit
37. Methyl Chloride	50	ND	ND	< MQL	ND	< MQL	ND
36. Methyl bromide	50	ND	ND	< MQL	ND	< MQL	ND
38. Methylene chloride	20	ND	ND	< MQL	ND	< MQL	ND
39. 1-1-2-2-Tetrachloroethane	10	ND	ND	< MQL	ND	< MQL	ND
40. Tetrachlroethylene	10	ND	ND	< MQL	ND	< MQL	ND
41. Toluene	10	ND	ND	< MQL	ND	< MQL	ND
42. 1,2-trans-dichloroethylene	10	ND	ND	< MQL	ND	< MQL	ND
44. 1-1-2-Trichloroethane	10	ND	ND	< MQL	ND	< MQL	ND
43. 1-1-1-Trichloroethane	10	ND	ND	< MQL	ND	< MQL	ND
45. Trichloroethylene	10	ND	ND	< MQL	ND	< MQL	ND
46. Vinyl Chloride	10	ND	ND	< MQL	ND	< MQL	ND
ACID COMPOUNDS							
47. 2-Chlorophenol	10	ND	ND	< MQL	ND	< MQL	ND
48. 2-4-Dichlorphenol	10	ND	ND	< MQL	ND	< MQL	ND
49. 2-4 Dimethylphenol	10	ND	ND	< MQL	ND	< MQL	ND
50. 4,6-Dinitro-o-Cresol	50	ND	ND	< MQL	ND	< MQL	ND
51. 2,4-Dinitrophenol	50	ND	ND	< MQL	ND	< MQL	ND
52.-53. Nitrophenols	20	ND	ND	< MQL	ND	< MQL	ND
54. 4 Chloro-3-methylphenol	10	ND	ND	< MQL	ND	< MQL	ND
55. Pentachlorophenol	5	ND	ND	< MQL	ND	< MQL	ND
56. Phenol	10	ND	ND	< MQL	ND	< MQL	ND
57. 2-4-6-Trichlorophenol	10	ND	ND	< MQL	ND	< MQL	ND
BASE/NEUTRAL COMPOUNDS							
58. Acenaphthene	10	ND	ND	< MQL	ND	< MQL	ND
59. Acenapthylene	10	ND	ND	< MQL	ND	< MQL	ND
60. Anthracene	10	ND	ND	< MQL	ND	< MQL	ND
61. Benzidine	50	ND	ND	< MQL	ND	< MQL	ND
62. Benzo(a) anthracene	5	ND	ND	< MQL	ND	< MQL	ND
63. Benzo(a) pyrene	5	ND	ND	< MQL	ND	< MQL	ND
64. 3,4-benzoflouranthene	10	ND	ND	< MQL	ND	< MQL	ND
65. Benzo(g,h,i)perylene	20	ND	ND	< MQL	ND	< MQL	ND
66. Benzo(k) fluoranthene	5	ND	ND	< MQL	ND	< MQL	ND
67. Bis(2-chloroethoxy)methane	10	ND	ND	< MQL	ND	< MQL	ND
68. Bis(2-chloroethly) Ether	10	ND	ND	< MQL	ND	< MQL	ND
69. Bis(2-Chloroisopropyl) eth	10	ND	ND	< MQL	ND	< MQL	ND
70. Bis(2-ethylhexyl)phthalate	10	31	11	< MQL	ND	< MQL	ND

	MQLs, µg/L	EDWU - North	EDWU - South	EDCC	GLCC	Lion Oil Company	Joint Permit
71. 4-Bromophenyl phenyl ether	10	ND	ND	< MQL	ND	< MQL	ND
72. Butylbenzy phthalate	10	ND	ND	< MQL	ND	< MQL	ND
73. 2-chloronapthalene	10	ND	ND	< MQL	ND	< MQL	ND
74. 4-chlorophenyl phenyl ether	10	ND	ND	< MQL	ND	< MQL	ND
75. Chrysene	5	ND	ND	< MQL	ND	< MQL	ND
76. Dibenzo(a,h)anthracene	5	ND	ND	< MQL	ND	< MQL	ND
77-79. Dichlorobenzene(1,2-1,3-1,4)	10	ND	ND	< MQL	ND	< MQL	ND
80. 3,3' Dichlorobenzidine	5	ND	ND	< MQL	ND	< MQL	ND
81. Diethyl Phthalate	10	ND	ND	< MQL	ND	< MQL	ND
82. Dimethyl phthalate	10	ND	ND	< MQL	ND	< MQL	ND
83. Di-n-Butyl phthalate	10	ND	ND	< MQL	ND	12.6	ND
84. 2-4-Dinitrotoluene	10	ND	ND	< MQL	ND	< MQL	ND
85. 2-6-Dinitrotoluene	10	ND	ND	< MQL	ND	< MQL	ND
86. Di-n-octyl phthalate	10	ND	ND	< MQL	ND	< MQL	ND
87. 1,2-diphenylhydrazine	20	ND	ND	< MQL	ND	< MQL	ND
88. Fluoranthene	10	ND	ND	< MQL	ND	< MQL	ND
89. Fluorene	10	ND	ND	< MQL	ND	< MQL	ND
90. Hexachlorobenzene	5	ND	ND	< MQL	ND	< MQL	ND
91. Hexachlorobutadiene	10	ND	ND	< MQL	ND	< MQL	ND
92. Hexachlorocyclopentadiene	10	ND	ND	< MQL	ND	< MQL	ND
93. Hexachloroethane	20	ND	ND	< MQL	ND	< MQL	ND
94. Indeno(1,2,3-cd)pyrene	5	ND	ND	< MQL	ND	< MQL	ND
95. Isophorone	10	ND	ND	< MQL	ND	< MQL	ND
96. Naphthalene	10	ND	ND	< MQL	ND	< MQL	ND
97. Nitrobenzene	10	ND	ND	< MQL	ND	< MQL	ND
98. N-nitrosodimethylamine	50	ND	ND	< MQL	ND	< MQL	ND
99. N-nitrosodi-n-propylamine	20	ND	ND	< MQL	ND	< MQL	ND
100. N-nitrosodiphenylamine	20	ND	ND	< MQL	ND	< MQL	ND
101. Phenanthrene	10	ND	ND	< MQL	ND	< MQL	ND
103. 1,2,4-trichlorobenzene	10	ND	ND	< MQL	ND	< MQL	ND
PESTICIDES							
104. Aldrin	0.01	ND	ND	< MQL	ND	< MQL	ND
105. Alpha-BHC	0.05	ND	ND	< MQL	ND	< MQL	ND
106. Beta-BHC	0.05	ND	ND	< MQL	ND	< MQL	ND
107. Gamma-BHC	0.05	ND	ND	< MQL	ND	0.064	ND
108. Delta-BHC	0.05	ND	ND	< MQL	ND	< MQL	ND
109. Chlordane	0.2	ND	ND	< MQL	ND	< MQL	ND
110. 4,4'-DDT	0.02	ND	ND	< MQL	ND	< MQL	ND

	MQLs, µg/L	EDWU - North	EDWU - South	EDCC	GLCC	Lion Oil Company	Joint Permit
111. 4,4'-DDE	0.1	ND	ND	< MQL	ND	< MQL	ND
112. 4,4'-DDD	0.1	ND	ND	< MQL	ND	< MQL	ND
113. Dieldrin	0.02	ND	ND	< MQL	ND	< MQL	ND
114. Alpha-endosulfan	0.01	ND	ND	< MQL	ND	< MQL	ND
115. Beta-endosulfan	0.02	ND	ND	< MQL	ND	< MQL	ND
116. Endosulfan sulfate	0.1	ND	ND	< MQL	ND	< MQL	ND
117. Endrin	0.02	ND	ND	< MQL	ND	< MQL	ND
118. Endrin aldehyde	0.1	ND	ND	< MQL	ND	< MQL	ND
119. Heptachlor	0.01	ND	ND	< MQL	ND	< MQL	ND
120. Heptachlor epoxide	0.01	ND	ND	< MQL	ND	< MQL	ND
121. PCB-1242	0.2	ND	ND	< MQL	ND	<MQL	ND
122. PCB-1254	0.2	ND	ND	< MQL	ND	<MQL	ND
123. PCB-1221	0.2	ND	ND	< MQL	ND	<MQL	ND
124. PCB-1232	0.2	ND	ND	< MQL	ND	<MQL	ND
125. PCB-1248	0.2	ND	ND	< MQL	ND	<MQL	ND
126. PCB-1260	0.2	ND	ND	< MQL	ND	<MQL	ND
127. PCB-1016	0.2	ND	ND	< MQL	ND	<MQL	ND
128. Toxaphene	0.3	ND	ND	< MQL	ND	< MQL	ND
130. Chlorpyrifos	0.07	ND	ND	< MQL	ND	< MQL	ND