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3683 STATE HIGHWAY 77 NORTH
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January 23, 2019

Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Attn: Bailey Taylor – Enforcement Analyst

RE: City of Marion
NPDES Permit No.AR0021971
AFIN 18-00110

Dear Bailey,

This is in reference to your November 27, 2018 correspondence pertaining to effluent violations.

For our discussion I have attached individual sample results for those months in 2018 that Marion had a discharge. With the exception of one outlier in BOD on January 2nd of 37 mg/L, Marion did not have another violation until March 27th of 39 mg/L. Most of the other results in this interim were in the teens. Beginning April 17 of 2018 Marion started seeing an upturn in BOD.

Starting in June there appeared to be some rather strange results. If you will note BOD on June 26th you find 5 mg/L which is excellent; two days later the BOD is 45 mg/L. Look forward to August 21st the BOD jumps to 84 mg/L, two days later 112 mg/L, by the 28th it was still at 80 mg/L and then two days later it's at 17 mg/L.

With stabilization ponds for treatment and a flow-thru detention time measured in months, there is not a very good explanation for these wide swings in BOD quality. Marion does not have any industry that would be dumping, even if they did it should not impact the discharge quality over a two day period.

We have tried to anticipate windy conditions causing a stirring in the pond however by the time the sewage flow-thru reaches the fourth pond, which is only about four feet deep, how could one anticipate a stratification that would cause this wide range of water quality?

As we have gone through these results and arrived at a conclusion that treatment efficiency should not produce these wide ranges of results, we begin to

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question sampling technique. If you will review our plans you will see where the latest improvements included 13 miles of force main moving Marion's point of discharge to the Mississippi River. Because this discharge is at the high bank of the River and under water some portion of the year, we could not utilize the force main as Chlorine detention time which would require sampling at the end point. For this reason we included in our design a Chlorine contact basin followed by de-Chlorination as the discharge pump moves the sewage to the force main. Since we were required to install a composite sampler, we moved 50' down the force main to allow mixing of the de-Chlorination chemical and tapped this line to create a sampling point. This 1" line then returns to the enclosure housing the composite sampler.

We are now trying to assess the impact that this sampling method may have on our results. A minor point is that the composite sampler comes with a provision to purge the line just ahead of the sampler in order to get a representative portion. It appears that this purge volume is not as great as the 50' of 1" tubing from the force main tap back to the sampler. Since this sample line is always down stream of any Chlorine residual, there is now a concern that what the sampler is picking up may not be representative of what is going down the force main.

We are now collecting BOD samples on both sides of the Chlorine contact chamber to determine if there is any impact from sediment in this 12' deep basin. We are also going to determine if there is a method of Chlorinating and cleaning this 50' of sample return line.

We will keep you informed of any results or findings as they become conclusions. By the way samples for January 8, 2019 were 20 mg/L BOD and 8 mg/L TSS. Results for January 15, 2019 were 14 mg/L BOD and 4 mg/L TSS.

Sincerely,



Jerome Alford, P.E.

JAN 2018

											MARION DMR INFORM
EFF DATA											
DAYS	FLOW RATE MGD	EFF DO MG/L	EFF PH SU	EFF NH3 MG/L	EFF NH3 LBS	EFF CBOD MG/L	EFF CBOD LBS	EFF TSS MG/L	EFF TSS LBS	EFF CL RES MG/L	EFF FECAL GEO
1	2.27										
2	1.30	9.77				37	401.15	24	260.21	0.56	4
3	0.94		7.78					21	165.33	0.81	4
4	1.50					28	350.28	21	262.71	0.81	1
5	2.50										
6	2.50										
7	2.50										
8	2.50										
9	1.50	9.61	7.82			13	162.63	10	125.10	0.82	9
10	1.50							15	187.65	0.79	8
11	1.50					16	200.16	17	212.67	0.8	15
12	2.50										
13	2.50										
14	2.50										
15	2.50										
16	2.50	9.3	7.78			14	291.90	14	291.90	0.63	38
17	1.50							13	162.63	0.6	2
18	1.50					18	225.18	9	112.59	0.71	3
19	1.50										
20	2.50										
21	2.50										
22	2.50										
23	2.50	5.33	7.53			16	333.60	10	208.50	0.66	1
24	2.90							9	217.67		1
25	2.70					12	270.22	8	180.14		5
26	2.70										
27	2.70										
28	2.70										
29	2.70										
30	2.70	4.68	7.47			16	360.29	11	247.70	0.63	82
31	2.70							8	180.14	0.63	119
AVG	2.24	7.74	7.68	#DIV/0!		18.89	288.38	13.57	201.07	0.70	20.86
MIN	0.94	4.68	7.47			12.00	162.63	8.00	112.59	0.56	1.00
MAX	2.90	9.77	7.82			37.00	401.15	24.00	291.90	0.82	119.00

FEB 2018

											MARION DMR INFORMATION	
											EFF DATA	
	FLOW RATE	EFF DO	EFF PH	EFF NH3	EFF NH3	EFF CBOD	EFF CBOD	EFF TSS	EFF TSS	EFF CL RES	EFF FECAL	
DAYS	MGD	MG/L	SU	MG/L	LBS	MG/L	LBS	MG/L	LBS	MG/L	GEO	
1	2.70				0.00	15	337.77	8	180.14	0.58	61	
2	2.70				0.00							
3	2.70				0.00							
4	2.70				0.00							
5	2.70				0.00							
6	2.70	5.07	7.69		0.00	14	315.25	13	292.73	0.59	104	
7	2.70				0.00			14	315.25	0.58	138	
8	2.70				0.00	16	360.29	6	135.11	0.78	1	
9	2.70				0.00							
10	2.70				0.00							
11	2.70				0.00							
12	2.70				0.00							
13	2.70	4.91	7.56		0.00	27	607.99	7	157.63	0.6	1	
14	2.70				0.00			8	180.14		1	
15	2.70				0.00	14	315.25	12	270.22		11	
16	2.70				0.00							
17	2.70				0.00							
18	2.70				0.00							
19	2.70				0.00							
20	2.70	3.99	7.54		0.00	12	270.22	16	360.29	0.5	52	
21	2.70				0.00			8	180.14	0.61	196	
22	3.70				0.00	11	339.44	4	123.43	0.57	21	
23	3.60				0.00							
24	3.60				0.00							
25	3.60				0.00							
26	3.60				0.00							
27	3.50	6.68	7.7		0.00	5	145.95	7	204.33	0.51	8	
28	3.50				0.00			4	116.76	0.52	1	
29					0.00							
30					0.00							
31					0.00							
AVG	2.92	5.16	7.62	#DIV/0!	0.00	14.25	336.52	8.92	209.68	0.58	49.58	
MIN	2.70	3.99	7.54	0.00	0.00	5.00	145.95	4.00	116.76	0.50	1.00	
MAX	3.70	6.68	7.70	0.00	0.00	27.00	607.99	16.00	360.29	0.78	196.00	

APRIL 2018

											MARION DMR INFORMATION	
EFF DATA												
	FLOW RATE	EFF DO	EFF PH	EFF NH3	EFF NH3	EFF CBOD	EFF CBOD	EFF TSS	EFF TSS	EFF CL RES	EFF FECAL	
DAYS	MGD	MG/L	SU	MG/L	LBS	MG/L	LBS	MG/L	LBS	MG/L	GEO	
1	1.90				0.00							
2	1.90				0.00							
3	1.80	4.98	7.56		0.00	16	240.19	12	180.14	0.58	4	
4	1.80				0.00			10	150.12	0.61	4	
5	1.80				0.00	13	195.16	16	240.19	0.59	1	
6	2.00				0.00							
7	2.00				0.00							
8	2.00				0.00							
9	2.00				0.00							
10	2.00	5.56	8.33		0.00	18	300.24	18	300.24	0.61	1	
11	0.61				0.00			12	61.05	0.59	1	
12	0.42				0.00	27	94.58	28	98.08	0.59	1	
13	0.00				0.00							
14	1.20				0.00							
15	2.00				0.00							
16	2.30				0.00							
17	2.50	11.99	8.55		0.00	34	708.90	38	792.30	0.54	37	
18	2.50				0.00			49	1021.65	0.55	20	
19	2.50				0.00	41	854.85	237	4941.45	0.53	120	
20	2.50				0.00							
21	2.50				0.00							
22	2.50				0.00							
23	2.50				0.00							
24	2.50	7.52	8.62		0.00	34	708.90	48	1000.80	0.5	17	
25	2.70				0.00			37	833.17	0.51	17	
26	2.90				0.00	37	894.88	53	1281.86	0.53	120	
27	2.90				0.00							
28	2.90				0.00							
29	2.90				0.00							
30	2.70				0.00							
31					0.00							
AVG	2.09	7.51	8.27	#DIV/0!	0.00	27.50	499.71	46.50	908.42	0.56	28.58	
MIN	0.00	4.98	7.56	0.00	0.00	13.00	94.58	10.00	61.05	0.50	1.00	
MAX	2.90	11.99	8.62	0.00	0.00	41.00	894.88	237.00	4941.45	0.61	120.00	

JUNE 2018

												MARION DMR INFORMATION	
												EFF DATA	
	FLOW RATE	EFF DO	EFF PH	EFF NH3	EFF NH3	EFF CBOD	EFF CBOD	EFF TSS	EFF TSS	EFF CL RES	EFF FECAL		
DAYS	MGD	MG/L	SU	MG/L	LBS	MG/L	LBS	MG/L	LBS	MG/L	GEO		
1	2.90				0.00								
2	3.30				0.00								
3	3.50				0.00								
4	3.60				0.00								
5	3.50	5.45	8.22		0.00	36	1050.84	39	1138.41	0.55	141		
6	2.90				0.00			54	1306.04	0.53	20		
7	2.60				0.00	24	520.42	42	910.73	0.55	18		
8	2.50				0.00								
9	2.50				0.00								
10	2.50				0.00								
11	2.50				0.00								
12	2.50	4.41	7.16		0.00	25	521.25	48	1000.80	0.5	3		
13	2.40				0.00			62	1240.99	0.51	14		
14	2.50				0.00	17	354.45	26	542.10	0.53	9		
15	2.40				0.00								
16	2.40				0.00								
17	2.40				0.00								
18	2.30				0.00								
19	2.20	4.52	8.31		0.00	32	587.14	88	1614.62	0.56	5		
20	2.20				0.00			57	1045.84	0.56	6		
21	2.20				0.00	27	495.40	71	1302.71	0.58	727		
22	2.10				0.00								
23	0.70				0.00								
24	1.50				0.00								
25	2.40				0.00								
26	2.50	4.68	8.41		0.00	5	104.25	25	521.25	0.54	19		
27	2.60				0.00			96	2081.66	0.56	21		
28	1.70				0.00	45	638.01	2	28.36	0.57	12		
29	1.70				0.00								
30	2.00				0.00								
31					0.00								
AVG	2.43	4.77	8.03	#DIV/0!	0.00	26.38	533.97	50.83	1061.13	0.55	82.92		
MIN	0.70	4.41	7.16	0.00	0.00	5.00	104.25	2.00	28.36	0.50	3.00		
MAX	3.60	5.45	8.41	0.00	0.00	45.00	1050.84	96.00	2081.66	0.58	727.00		

AUG 2018

											MARION DMR INFORMATION	
											EFF DATA	
	FLOW RATE	EFF DO	EFF PH	EFF NH3	EFF NH3	EFF CBOD	EFF CBOD	EFF TSS	EFF TSS	EFF CL RES	EFF FECAL	
DAYS	MGD	MG/L	SU	MG/L	LBS	MG/L	LBS	MG/L	LBS	MG/L	GEO	
1	1.50	4.12	7.61		0.00	30	375.30	43	537.93	0	172	
2	1.50				0.00			24	300.24	0	687	
3	2.50				0.00	14	291.90	20	417.00	0	921	
4	2.50				0.00							
5	2.50				0.00							
6	2.50				0.00							
7	1.40	4.12	7.62		0.00	33	385.31	58	677.21	0	32	
8	1.60				0.00			18	240.19	0	199	
9	1.50				0.00	21	262.71	69	863.19	0	13	
10	2.50				0.00							
11	2.50				0.00							
12	2.50				0.00							
13	2.50				0.00							
14	1.50	3.81	7.59		0.00	19	237.69	36	450.36	0	76	
15	1.50				0.00			56	700.56	0	276	
16	1.50				0.00	12	150.12	21	262.71	0	147	
17	2.50				0.00							
18	2.50				0.00							
19	2.50				0.00							
20	2.50				0.00							
21	1.50	4.2	6.98		0.00	84	1050.84	96	1200.96	0	41	
22	1.50				0.00			13	162.63	0	46	
23	1.50				0.00	112	1401.12	83	1038.33	0	30	
24	0.85				0.00							
25	0.00				0.00							
26	0.00				0.00							
27	1.50				0.00							
28	1.50	4.05	6.57		0.00	80	1000.80	41	512.91	0	26	
29	1.50				0.00			48	600.48	0	7	
30	2.20				0.00	17	311.92	36	660.53	0	2420	
31	2.90				0.00							
AVG	1.84	4.06	7.27	#DIV/0!	0.00	42.20	546.77	44.13	575.02	0.00	339.53	
MIN	0.00	3.81	6.57	0.00	0.00	12.00	150.12	13.00	162.63	0.00	7.00	
MAX	2.90	4.20	7.62	0.00	0.00	112.00	1401.12	96.00	1200.96	0.00	2420.00	

NOVEMBER 2018

											MARION DMR INFORMATION		
EFF DATA													
OW RA	EFF DO	EFF PH	EFF NH3	EFF NH3	EFF CBOI	EFF CBOI	EFF TSS	EFF TSS	EFF CL R	EFF FECAL			
GD	MG/L	SU	MG/L	LBS	MG/L	LBS	MG/L	LBS	MG/L	GEO			
2.70				0.00	19	427.84	40	900.72	0				
0.84				0.00									
0.00				0.00									
0.00				0.00									
1.80				0.00									
2.70	7.76	7.27		0.00	27	607.99	30	675.54	0	1			
2.70				0.00			36	810.65	0	10			
2.70				0.00	15	337.77	43	968.27	0	1			
2.70				0.00									
2.50				0.00									
1.90				0.00									
2.70				0.00									
2.70	9.92	6.53		0.00	28	630.50	24	540.43	0	1			
2.70				0.00			25	562.95	0	1			
2.70				0.00	30	675.54	22	495.40	0	1			
0.83				0.00									
0.00				0.00									
1.60				0.00									
2.40				0.00	27	540.43	28	560.45	0	1			
2.50	9.93	7.42		0.00			56	1167.60	0	1			
2.50				0.00	33	688.05	56	1167.60	0	1			
0.85				0.00									
0.00				0.00									
0.00				0.00									
0.00				0.00									
1.20				0.00									
1.50	10.56	7.82		0.00			21	262.71	0	1			
1.50				0.00	33	412.83	26	325.26	0	1			
1.50				0.00	42	525.42	48	600.48	0	7			
0.84				0.00									
				0.00									
1.62	9.54	7.26	#DIV/0!	0.00	28.22	538.49	35.00	695.24	0.00	2.25			
0.00	7.76	6.53	0.00	0.00	15.00	337.77	21.00	262.71	0.00	1.00			
2.70	10.56	7.82	0.00	0.00	42.00	688.05	56.00	1167.60	0.00	10.00			

DECEMBER 2018

MARION DMI

EFF DATA											
DAYS	FLOW RATE MGD	EFF DO MG/L	EFF PH SU	EFF NH3 MG/L	EFF NH3 LBS	EFF CBOD MG/L	EFF CBOD LBS	EFF TSS MG/L	EFF TSS LBS	EFF CL RES MG/L	EFF FECAL GEO
1	1.70				0.00						
2	2.50				0.00						
3	1.50				0.00						
4	1.50	8.68	7.94		0.00	32	400.32	16	200.16	0	5
5	1.50				0.00			26	325.26	0	1
6	1.50				0.00	45	562.95	27	337.77	0	21
7	2.50				0.00						
8	2.50				0.00						
9	1.60				0.00						
10	2.50				0.00						
11	1.40	12.2	6.58		0.00	31	361.96	18	210.17	0	27
12	1.50				0.00			32	400.32	0	1
13	2.00				0.00	50	834.00	27	450.36	0	15
14	2.80				0.00						
15	2.80				0.00						
16	2.80				0.00						
17	2.80				0.00						
18	2.80	9.94	6.89		0.00	37	864.02	27	630.50	0	4
19	2.80				0.00			25	583.80	0	1
20	2.80				0.00	29	677.21	21	490.39	0	/
21	2.80				0.00						
22	2.80				0.00						
23	2.80				0.00						
24	2.80				0.00						
25	2.80				0.00						
26	2.80	7.59	6.36		0.00	28	653.86	15	350.28	0	1
27	2.80				0.00			20	467.04	0	1
28	2.80				0.00	38	887.38	25	583.80	0	10
29	2.80				0.00						
30	2.80				0.00						
31	1.90				0.00						
AVG	2.38	9.60	6.94	#DIV/0!	0.00	36.25	655.21	23.25	419.15	0.00	7.33
MIN	1.40	7.59	6.36	0.00	0.00	28.00	361.96	15.00	200.16	0.00	1.00
MAX	2.80	12.20	7.94	0.00	0.00	50.00	887.38	32.00	630.50	0.00	27.00