

JAN 24 2024

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF WATER POLLUTION CONTROL

PLANT: Lowland Wastewater Treatment Plant - NPDES TN0068187

REPORT OF OPERATION OF WASTEWATER TREATMENT

OWNER: Morristown Utility Commission

MONTH OF: December-23

Date	Rainfall	Influent Daily Flow Million	Hours Bypassed	Temp C Raw WstWtr	5 Day BOD mg/L		SUSPENDED SOLIDS mg/L		SETTLABLE SOLIDS mg/L		DISSOLVED OXYGEN mg/L		pH		
					Raw WstWtr	Final Effluent	Raw WstWtr	Final Effluent	Raw WstWtr	Final Effluent	Raw WstWtr	Final Effluent	Raw WstWtr	Final Effluent	
1	2	3	6	7	8	10	11	13	14	16	17	19	20	21	22
12/1/2023	0.10	0.304776	0.00	17					5.0	0.3	0.5	8.5	6.9		7.8
12/2/2023	1.42	0.350872	0.00	17							0.4	8.2	6.9		7.7
12/3/2023	0.25	0.273609	0.00	16							2.6	8.5	7.3		7.9
12/4/2023	0.02	0.441923	0.00	15	1,370	48	690	26			1.6	8.6	7.5		8.1
12/5/2023	0.07	0.321645	0.00	16					9.5	0.3	0.8	8.5	6.9		8.2
12/6/2023	0.01	0.345790	0.00	16	969	40	200	29			0.6	8.4	7.2		8.2
12/7/2023	0	0.325969	0.00	16	867	36	165	21	11.0	0.3	0.8	8.3	7.5		8.1
12/8/2023	0	0.462527	0.00	16					7.3	0.3	0.6	8.4	6.9		8.0
12/9/2023	0.57	0.300579	0.00	15							2.0	7.9	7.2		7.9
12/10/2023	0.74	0.300579	0.00	15							2.8	7.5	7.3		7.9
12/11/2023	0	0.384010	0.00	15	550	66	450	54			1.7	8.7	7.6		8.2
12/12/2023	0	0.366649	0.00	15					7.0	0.1	1.3	8.0	7.6		8.9
12/13/2023	0	0.334350	0.00	15	1,010	47	330	19			1.2	8.1	7.4		8.1
12/14/2023	0	0.360589	0.00	15	1,190	64	530	33	8.4	0.1	1.4	8.4	7.5		7.8
12/15/2023	0	0.360588	0.00	16					8.0	0.1	1.0	8.1	7.5		7.8
12/16/2023	0	0.344834	0.00	16							0.6	8.5	7.1		7.8
12/17/2023	0	0.146670	0.00	16							7.5	7.2	7.8		7.8
12/18/2023	0	0.275274	0.00	15	592	40	380	43			1.2	7.2	7.3		7.8
12/19/2023	0	0.336428	0.00	15					14.0	0.3	0.4	8.5	7.4		8.0
12/20/2023	0	0.336428	0.00	15	1,230	77	540	350			0.5	8.4	6.7		7.6
12/21/2023	0	0.338168	0.00	15	861	79	245	900	10.0	0.3	0.5	7.5	6.8		7.8
12/22/2023	0	0.330449	0.00	15					11.0	0.3	0.4	7.8	7.1		7.7
12/23/2023	0	0.279071	0.00	15							0.5	8.1	6.9		7.0
12/24/2023	0	0.279071	0.00	15							0.6	7.9	6.7		7.6
12/25/2023	0.01	0.065932	0.00	16	888	58	480	52			1.3	8.1	7.7		8.0
12/26/2023	0.27	0.066244	0.00	16					7.3	0.3	1.0	8.0	7.4		7.9
12/27/2023	0	0.093312	0.00	15	484	18	410	80			1.8	8.2	7.7		8.0
12/28/2023	0.01	0.271633	0.00	15	1,010	72	580	98	8.5	0.3	0.7	7.9	7.6		8.0
12/29/2023	0	0.364866	0.00	15					11.5	0.3	0.5	8.1	7.3		7.9
12/30/2023	0	0.165992	0.00	15							0.5	8.4	7.4		7.6
12/31/2023	0		0.00	15							0.6	8.6	7.4		7.7
TOTAL	3.47	8.953627	0.00												
AVERAGE	0.11	0.288827	#DIV/0!	15.5	918	54	417	142		<0.3	1.22				
MAXIMUM	1.42	0.462527	0.00	17	1,370	79	690	900		<0.3	7.5	8.7	7.8		8.9
MINIMUM	0	0.024800	0.00	15	484	18	165	19		<0.3	0.39	7.2	6.7		7.0

Remarks

Signed Barry D. Calfee /

Certification Tennessee Operator #1726

DA 1859

Date	Final Effluent															Final Effluent					
				MLSS Aeration Basin #1	MLSS Aeration Basin #2	MLSS Aeration Basin #3		Nitrogen, Ammonia, total mg/L	Nitrogen, Ammonia, total pounds							Mercury, total mg/L		Nitrogen, total mg/L		Phosphoro us, total mg/L	
45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
12/1/2023				2520	2540	2120		68.30	230.66												
12/2/2023				2780	4080	2340															
12/3/2023				2800	3560	2240															
12/4/2023				2960	3220	2540		83.00	283.50												
12/5/2023				2560	2720	2060		64.00	174.10									91.8		10.7	
12/6/2023				2840	3120	2340		82.00	234.59												
12/7/2023				3300	3020	2620		77.10	215.02												
12/8/2023				2960	3060	2200		53.00	204.45												
12/9/2023				2960	3300	3460															
12/10/2023				2640	2820	2540															
12/11/2023				2980	2840	2440		57.00	188.59												
12/12/2023				3960	3140	2480		21.90	63.50									99.8		10.1	
12/13/2023				5860	3020	2580		23.00	60.49												
12/14/2023				6380	3980	3120		20.00	58.78												
12/15/2023				6080	3820	2960		21.00	60.02												
12/16/2023				3200	3300	3000															
12/17/2023				3860	3460	3280															
12/18/2023				4040	3420	3220		2.30	5.70												
12/19/2023				3500	3520	2600		0.02	0.06									74.7		19.6	
12/20/2023				3300	3280	2880		1.00	2.36												
12/21/2023				3480	3180	2820		2.70	7.18												
12/22/2023				3840	3040	2840		5.90	15.16												
12/23/2023				3320	2960	2700															
12/24/2023				3640	3200	2900															
12/25/2023				4420	3420	3080		0.20	0.11												
12/26/2023				3700	3500	3060		0.20	0.11									61.2		21.7	
12/27/2023				3280	3120	2760		0.20	0.16												
12/28/2023				3580	3180	2300		0.20	0.53												
12/29/2023				3160	3340	2520		0.20	0.73												
12/30/2023				3200	3440	2640															
12/31/2023				3340	3600	2860															
TOTAL								583.22	1805.80												
AVERAGE				3,563	3,265	2,694		27.77	85.99												
MAXIMUM				6380	4080	3460		83.00	283.50							#DIV/0!		81.875		15.53	
MINIMUM				2520	2540	2060		0.02	0.06							0.00000		99.80		21.70	
																0.00000		61.20		10.10	




Morristown Utilities
 Turkey Creek Wastewater Treatment Plant
 1722 Tyler Rd.
 Morristown, TN 37814
 Ph. 423-317-6331 Fax 423-616-0102

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DISCHARGE MONITORING REPORT TRANSMITTAL MEMO

TO: Hassan Sanaat
 Tennessee Dept. of Environment and Conservation
 Division of Water Resources
 Knoxville Environmental Field Office
 3711 Middlebrook Pike
 Knoxville, TN 37921

From: Barry Calfee, WWTP Manager 
 Morristown Utility Systems
 Lowland Wastewater Treatment Plant
 1722 Tyler Road
 Morristown, TN 37814

Date: January 12, 2023

Subject: NPDES Permit No. TN0068187
 December 2023 Discharge Monitoring Report

During December 2023, the Lowland Wastewater Treatment Plant experienced the following violations:

Date	Parameter	Limit/Reported Concentration
12/11/2023	TSS Daily Max	45/54 mg/l
12/20/2023	TSS Daily Max	45/350 mg/l
12/20/2023	TSS % Removal Daily Minimum %	>=40%/35%
12/21/2023	TSS Daily Max	45/900 mg/l
12/21/2023	TSS % Removal Daily Minimum %	>=40%/0%
12/17-23/2023	TSS Weekly Average	40/431 mg/l
12/25/2023	TSS Daily Max	45/52 mg/l
12/27/2023	TSS Daily Max	45/80 mg/l
12/28/2023	TSS Daily Max	45/98 mg/l
12/24-30/2023	TSS Weekly Average	40/77 mg/l
12/17-23/2023	TSS Weekly Average Pounds	<=167/1109 lbs
12/2023	TSS Monthly Average Pounds	<=125/353 lbs
12/2023	TSS % Removal Daily Minimum	=>85%/77%
12/2023	TSS Monthly Average	30/142 mg/l

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12/04/2023	BOD Daily Max	45/48 mg/l
12/03-09/2023	BOD Weekly Average	40/41 mg/l
12/11/2023	BOD Daily Max	45/66 mg/l
12/13/2023	BOD Daily Max	45/47 mg/l
12/14/2023	BOD Daily Max	45/64 mg/l
12/10-16/2023	BOD Weekly Average	40/59 mg/l
12/10-16/2023	BOD Weekly Average Pounds	<=167/177 lbs
12/20/2023	BOD Daily Max	45/77 mg/l
12/20/2023	BOD % Removal Daily Minimum	=>40%/35%
12/21/2023	BOD Daily Max	45/79 mg/l
12/21/2023	BOD % Removal Daily Minimum	=>40%/0%
12/17-23/2023	BOD Weekly Average	40/65 mg/l
12/25/2023	BOD Daily Max	45/58 mg/l
12/28/2023	BOD Daily Max	45/72 mg/l
12/24-30/2023	BOD Weekly Average	40/49 mg/l
11/24-30/2023	BOD Weekly Average Pounds	<=167/164 lbs
12/2023	BOD Monthly Average	30/54 mg/l
12/2023	BOD Monthly Average Pounds	<=125/136 lbs
12/2023	BOD % Removal Daily Minimum	=>85%/77%
12/01/2023	Ammonia Daily Max mg/l	20/68 mg/l
11/26-12/02/2023	Ammonia Weekly Average	15/22 mg/l
11/26-12/02/2023	Ammonia Weekly Average Pounds	<=63/69xxx lbs
12/04/2023	Ammonia Daily Max mg/l	20/83 mg/l
12/05/2023	Ammonia Daily Max mg/l	20/64 mg/l
12/06/2023	Ammonia Daily Max mg/l	20/82 mg/l
12/07/2023	Ammonia Daily Max mg/l	20/77 mg/l
12/08/2023	Ammonia Daily Max mg/l	20/53 mg/l
12/03-09/2023	Ammonia Weekly Average	15/72 mg/l
12/03-09/2023	Ammonia Weekly Average Pounds	<=63/222 lbs
12/11/2023	Ammonia Daily Max mg/l	20/57 mg/l
12/12/2023	Ammonia Daily Max mg/l	20/22 mg/l
12/13/2023	Ammonia Daily Max mg/l	20/23 mg/l
12/14/2023	Ammonia Daily Max mg/l	20/21 mg/l
12/10-16/2023	Ammonia Weekly Average	15/29 mg/l
12/10-16/2023	Ammonia Weekly Average Pounds	<=63/86 lbs
12/2023	Ammonia Monthly Average	10/28 mg/l
12/23	Ammonia Monthly Average Pounds	<=42/86 lbs

Note, for the month of December 2023, all BOD and TSS samples were sent out to a contract laboratory, Waypoint Analytical rather than ran in house. Historically, Morristown Utilities has conducted TSS and BOD analysis in-house. It was necessary to abruptly cease analysis in-house of these parameters due to sinkhole activity under the laboratory. The lab had to be cleared so that a subsurface remediation company could come inside the building, drill boreholes and ultimately inject grout in order to stabilize the building. On January 8, 2024, the Morristown Utilities lab at the Turkey Creek WWTP was restarted and BOD and TSS data will again be generated in-house



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Specific explanations:

For TSS violations:

The laboratory provided the following qualifier for the vast majority of TSS results, "Analyte: Total Suspended Solids QC Batch No: L712558 Relative percent difference (RPD) for the duplicate analysis was outside of the allowable quality control limits. The sample and duplicate results are less than ten times the reporting limit. At this level, RPD is not applicable. The data is considered to be acceptable."

In addition, TSS results have historically been very similar to BOD results. Again, Morristown Utilities finds it highly questionable that TSS results appear to be skewed significantly higher than the BOD results.

The TSS removal efficiency is directly proportional to a highly questionable influent TSS value of 60 mg/l. With no rainfall and no industrial incident this value is highly unusual.

For BOD violations:

The laboratory provided the following qualifiers:

"Analyte: BOD (5-day)

The dissolved oxygen (DO) depletion for the dilution water blank exceeded the 0.2 mg/L limit allowed by the reference method. For this analytical batch, the dilution water blank depleted 0.50 mg/L. An exceedance at this level could indicate a high bias which produces improperly elevated sample results."

In regard to excessive dilution blank depletion, values ranged from a low of 0.25 mg/l to a high of 1.45 mg/l and progressively increased throughout the month. The laboratory is aware of the concerns with BOD and are actively investigating the water unit.

"Analyte: BOD (5-day)

The BOD glucose-glutamic acid (GGA) check standard did not meet the criteria established by the reference method. The acceptance range provided in the reference method is 167.5 - 228.5 mg/L. The GGA result obtained for this analytical batch was 235.2 mg/L."

Much like the excessive blank depletion, the GGA results were on the high side thereby indicating that BOD values in general were biased high.

The above examples were repeated from the October MOR for the sake of brevity but continue to be accurate examples of the data.

As stated above, Morristown Utilities has returned to normal operations within the laboratory on January 8, 2024. Discussions have been held with Waypoint Analytical regarding the concerns with these results. Additional protocols have been implemented so that every sample collected is verified by a second Certified Operator to eliminate any possibility of cross sample collection.

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There has been some improvement in data quality however, data points from the effluent have varied significantly, within the same reporting week, thereby making the data highly suspect.

For AMMONIA violations:

At the end of November 2023 and beginning of December 2023, multiple mechanical problems were experienced with the RAS pump thereby creating challenges in maintaining a sufficient return rate. During the period of lower return rates, the nitrifying organisms were inhibited by excessive detention times in the bottom of the final clarifiers. As the Lowland WWTP is designed for ammonia oxidation it has the ability to operate aeration basin 1 as a selector (either anoxic or aerobic). The facility has been running with aeration basin 1 in anoxic mode in order to encourage the microbes to recover oxygen from nitrates and nitrites thereby releasing stored alkalinity to optimize chemical usage. During organism inhibition, aeration basin 1 was converted to aerobic and sodium hydroxide feed was increased in order to provide easily bio-accessible alkalinity which in turn reduces stress on the organisms to obtain necessary alkalinity for ammonia oxidation. This allowed the organisms to recover and the plant to return to a complaint status by mid-December.

Should you have any questions or comments regarding this submittal please feel free to contact me at bcalfee@musfiber.net or 423-317-6331.

Enclosures: KEAC: (1) Original MOR