

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 WATER DIVISION – INDUSTRIAL AND MUNICIPAL SECTIONS  
**NONCOMPLIANCE NOTIFICATION FORM**

PERMITTEE NAME: Prudes Creek WWTP PERMIT NO: AL0056120  
 FACILITY LOCATION: 500 Water Trail Graysville, AL 35073 (Jefferson County)  
 DMR REPORTING PERIOD: September 2015

1. DESCRIPTION OF DISCHARGE: (Include outfall number (s))

Outfall 0011 - The discharge for the facility exceeded the permitted TKN weekly average concentration discharge limitation, and the discharge was lower than the allowable daily minimum limit for dissolved oxygen on the 23<sup>rd</sup>. The TKN permitted weekly average loading limit was not exceeded.

2. DESCRIPTION OF NON-COMPLIANCE: (Attach additional pages if necessary):

<b>LIST EFFLUENT VIOLATIONS (If applicable)</b>			
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Result Reported (Include units)	Permit Limit (Include units)
Outfall 0011	Nitrogen, Kjeldahl Total (as N) Weekly Average	9.93mg/l	7.5mg/l
Outfall 0011	Oxygen, Dissolved (DO) Daily Minimum	5.4mg/l	5.5mg/l
<b>LIST MONITORING / REPORTING VIOLATIONS (If applicable)</b>			
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Monitoring / Reporting Violation (Provide description)	
N/A			

3. CAUSE OF NON-COMPLIANCE (Attach additional pages if necessary): See attachment
4. PERIOD OF NONCOMPLIANCE: (Include exact date(s) and time(s) or, if not corrected, the anticipated time the noncompliance is expected to continue):  
 The period of noncompliance includes the week September 20-26, 2015, and is based on samples days September 22nd, 23rd, and 24<sup>th</sup> for TKN. The effluent discharge was out of compliance for dissolved oxygen when the grab sample was taken on September 23, 2015.
5. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE (attach additional pages if necessary): See attachment

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Lynn Jones, Five Mile and Prudes Creek WWTP Manager  
 NAME AND TITLE OF RESPONSIBLE OFFICIAL (type or print)

 10/2/2015  
 SIGNATURE OF RESPONSIBLE OFFICIAL / DATE SIGNED

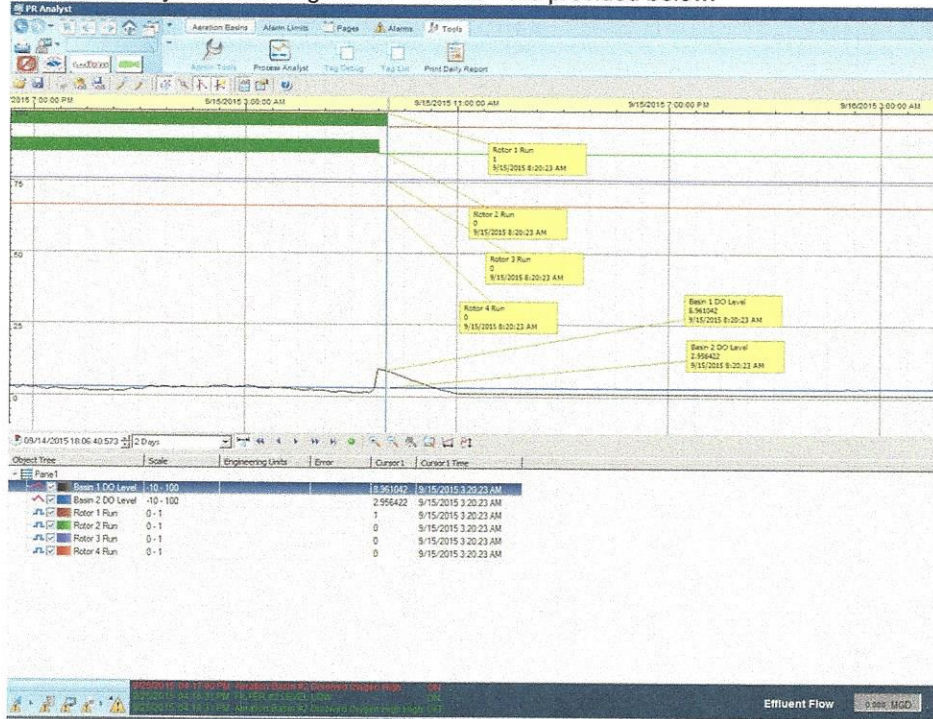
# ATTACHMENT

## 3. CAUSE OF NON-COMPLIANCE:

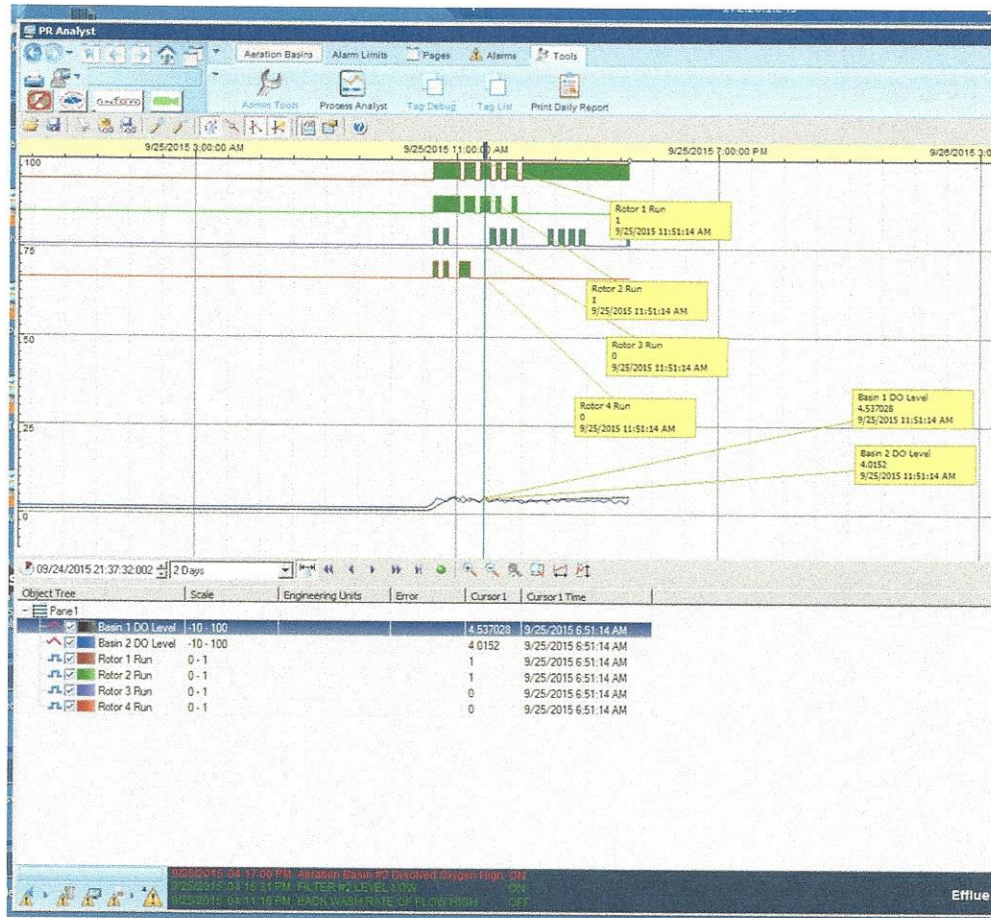
The weekly average ammonia concentration violation previously reported for the same period and the TKN and DO violations were caused by excessive wasting from the activated sludge process which lowered the biomass inventory to a level that did not produce effective nitrification and a lack of dissolved oxygen that also inhibited nitrification. Because there were failures in the instrumentation systems, it is suspected from the effluent results and operating conditions at the time, but not verifiable from plant records, that low dissolved oxygen levels in Aeration Basin #1 and Aeration Basin #2 contributed to inadequate nitrification. Effluent TKN sample results from the week were 8.2 mg/l, 9.6 mg/l, and 12.0 mg/l respectively. The weekly loading limit of 56.2 lbs/day was not exceeded. Process control samples from the 27<sup>th</sup> indicated that complete nitrification had been restored in the activated sludge process.

Between Tuesday September 15, 2015 and September 25, 2015, the DO probe on Aeration Basin #1 began to consistently display a false reading between 1.05 and 1.10 mg/l which is above the set-point that would have turned the rotors on if they had been running in the automatic control position. The DO readings are believed to be false because there were almost no variation between the minimum and maximum values recorded during this period. Aeration Basin #2 also showed unreliable DO readings. Per the logs in the SCADA system historian, the two brush rotors in Aeration Basin #1 and the two in Aeration basin #2 did not operate from 8:20 a.m. on September 15<sup>th</sup> until 10:15 a.m. on September 25, 2015 when they were found in the SCADA Manual (off) setting. Upon discovery, the rotors were changed to automatic control and began running. The operators who worked between the 15<sup>th</sup> and 25<sup>th</sup> failed to recognize the rotors were in an off-state and did not run despite recording data which indicated zero run hours on their daily log sheets. During this ten day period, the aerobic nitrifying bacteria were likely stressed by the low DO conditions that had developed, even though there were no indications of anaerobic conditions reported by the operators in Aeration Basin #1 or Aeration Basin #2.

Screen shots from the SCADA system showing the 15<sup>th</sup> and 25<sup>th</sup> are provided below.







The excessive wasting that caused the non-compliance was the result of instrumentation equipment failures coupled with errors in judgement on the part of members of the WWTP staff and is further described below. Each week on Thursday the WWTP staff perform mixed liquor suspended solids (MLSS) tests in the lab to determine the amount of biomass inventory present in each basin. The target MLSS was 2,500 to 3,000 mg/l. Starting earlier in the month of September, the portable Total Suspended Solids (TSS) meter reported a basin average of 3,630 mg/l while the lab tests reported an average of 2,620mg/l. Multiple calibration tests had been previously run, and the meter results were consistently higher than the lab output. Lab test data indicate the average MLSS values between the two basins were lowered from 2,620 to 1,140 mg/l over a 22 day period, a 74% reduction. The table below shows the results from the meter and laboratory tests.

September	MLSS				Waste (Hrs)
	Basin #1		Basin #2		
	Meter	Lab	Meter	Lab	
1	3,590	-	3,720	-	-
2	3,580	-	3,610	-	-
3	3,450	2,560	3,630	2,680	2
8	3,310	-	3,740	-	-
9	3,470	-	3,420	-	-
10	3,570	2,520	3,830	2,480	1
15	3,860	-	3,710	-	-
16	3,870	-	3,690	-	-
17	2,500	1,092	3,180	2,000	2
22	2,950	-	3,270	-	2
23	2,970	-	3,110	-	-
24	2,890	1,380	3,320	900	2
25	-	951	-	423	-



The amount of biomass to be wasted is normally based on the lab data from the previous test date. Wasting is done in increments of either one or two hours per basin. The trends from the metered data indicated that wasting was necessary. The lab data from September 17<sup>th</sup> was not utilized to make the decision to continue to waste. The TSS data from the meter was being used for trending solids levels and the lab data from the 10<sup>th</sup>. The Basin #1 meter readings on 9/22/2015 showed that the MLSS concentrations were increasing following the last day of wasting on 9/17/15. The difference between the lab data for 9/3/2015 and 9/10/2015 following wasting completed on 9/3/2015 for two hours resulted in a 1.6% reduction in MLSS concentration on Basin #1 and a 7% reduction in MLSS concentration for Basin #2. This slight reduction is also reflected in previous data following wasting for one to two hours. The actual reduction in solids concentration from 9/10/15 to 9/17/2015 was 57% for Basin #1, and 19% for Basin #2. This was a significant change in biomass concentration from one week to the next following wasting. This percent difference from 1 to 2 hours of wasting is not typical based on past experience; however, wasting continued with the WWTP operational staff relying on the metered MLSS values instead of the lab values.

After the initial verbal notice provided to ADEM on the 25<sup>th</sup> for ammonia noncompliance, the County subsequently became aware that noncompliant discharges occurred in the same period for DO and Total Kjeldahl Nitrogen. On the morning of September 26, 2015, Lynn Jones, WWTP Manager, gave verbal notice to ADEM's Nick Caraway, for these additional violations parameters. The DO results were available on the 23<sup>rd</sup>, but the WWTP staff did not recognize the value as a violation until the 26<sup>th</sup>.

#### **5. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE:**

On late Thursday afternoon the 24<sup>th</sup>, the ammonia sample results from the 22<sup>nd</sup> and 23<sup>rd</sup> were available and revealed the effluent ammonia exceed the permitted limitation. On Friday morning the 25<sup>th</sup>, the WWTP manager and the Environmental Services Department (ESD) management became aware that the weekly average limitation for ammonia would be exceeded. Lynn Jones, WWTP Manager, notified Nicholas Caraway of ADEM via phone. Instructions were provided to the Barton Lab and WWTP staff to test a creek sample taken downstream of the 0011 outfall on Five Mile Creek and to begin creek inspections to record the presence or absence of any fish kills. Process samples were taken and analyzed and revealed that the MLSS had been inadvertently lowered below needed levels for adequate nitrification. Plans were developed to truck in Waste Activated Sludge (WAS) from the Five Mile WWTP in 6,000 gallon loads to replenish the nitrifier population. The mixed liquor suspended solids (MLSS) concentration within the basin was to be raised to above 2,500 mg/l; wasting was to be stopped until the target was met; the DO was to be held above 3 mg/l; and a process control sampling plan was prepared.

The creek was investigated at approximately 4:00 PM on the 25<sup>th</sup> and there were no indications of any water quality problems within the receiving stream associated with the discharge. The creek downstream of the outfall was investigated each following day through the 28<sup>th</sup>, and no evidence of a fish kill was found.

Between 4:00 PM on September 25<sup>th</sup> and 1:00 AM on the morning of the 26<sup>th</sup>, two 6,000 gallon loads of hauled activated sludge were introduced into the influent Pump Station #1 wet-well. Process control samples were collected prior to UV disinfection. By 11:00 AM Saturday the 26<sup>th</sup>, the MLSS for Aeration Basin #1 was 4,088 mg/l and Basin #2 was 3,900 mg/l. The process control tests were added to the daily tests performed to ensure operational success. Process control samples from the 27<sup>th</sup> indicated that complete nitrification had been restored in the activated sludge process.

Concurrent with the operational plans developed on the 25<sup>th</sup>, ESD management mobilized the electrical and instrumentation maintenance groups to investigate and correct the DO and TSS meter calibration and performance problems and the rotor run-time issues. The WWTP staff was later directed to pull the daily log sheets with the recorded run time for each rotor to provide additional data to determine the possible time frame for the rotor instrumentation failures.

The operators were instructed to include daily verifications of the installed DO meters using a portable meter calibrated to low DO levels. The effluent DO sample practices were reviewed with the operators, and it was found that the sample point has been prior to cascade post aeration. The relocation of the DO sample location to a point closer to the receiving water is under review by ESD management.

Plant staff have been advised that field personnel should be more attentive to observed conditions, equipment operational status, and instrumentation data. Plant management has been advised that additional care should be exercised in the evaluation of plant operating data, especially when conflicting data is present, and critical plant process decisions should be exercised with due care. Plant management has been advised to be aware of current discharge limitations and promptly notify ESD management and ADEM when those limitations are exceeded.