LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

JUN 17 2019

Mr. Wayne Livingston, General Manager
Oxford Waterworks & Sewer Board
Post Office Box 3663
Oxford, AL 36203

RE: Draft Permit
NPDES Permit No. AL0058408
Oxford Tull C. Allen WWTP
Talladega County, Alabama

Dear Mr. Livingston:

Transmitted herein is a draft of the referenced permit.

We would appreciate your comments on the permit within **30 days** of the date of this letter. Please direct any comments of a technical or administrative nature to the undersigned.

By copy of this letter and the draft permit, we are also requesting comments within the same time frame from EPA.

Please be aware that Part I.C.1.c of your permit requires that you apply for participation in the Department's web-based Electronic Environmental (E2) Reporting System Program for submittal of DMRs upon issuance of this permit unless valid justification as to why you cannot participate is submitted in writing. Please also be aware that Part I.C.2.e of your permit requires that you apply for participation in the Department's web-based electronic environmental (E2) reporting system for submittal of **SSOs** within 30 days of coverage under this permit unless valid justification as to why you cannot participate is submitted in writing. After issuance of the permit, SSO hotline notifications and hard copy Form 415 SSO reports may be used only with the written approval from the Department. The E2 Program allows ADEM to electronically validate, acknowledge receipt, and upload data to the state's central wastewater database. This improves the accuracy of reported compliance data and reduces costs to both the regulated community and ADEM. The Permittee Participation Package may be downloaded online at **https://e2.adem.alabama.gov/npdes** or you may obtain a hard copy by submitting a written request or by emailing e2admin@adem.alabama.gov.

Please also be aware that Part IV. of your permit requires that you develop, implement, and maintain a Sanitary Sewer Overflow Response Plan.

The Alabama Department of Environmental Management encourages you to voluntarily consider pollution prevention practices and alternatives at your facility. Pollution Prevention may assist you in complying with effluent limitations, and possibly reduce or eliminate monitoring requirements.

Should you have any questions, please contact the undersigned by email at storbert@adem.alabama.gov or by phone at (334) 271-7800.

Sincerely,

Shanda Torbert
Municipal Section
Water Division
Enclosure

cc: Environmental Protection Agency Email
Ms. Elaine Snyder/U.S. Fish and Wildlife Service
Ms. Elizabeth Brown/Alabama Historical Commission
Advisory Council on Historic Preservation
Department of Conservation and Natural Resources

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

ADEM
Alabama Department of Environmental Management

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

PERMITTEE:	WATER WORKS & SEWER BOARD OF THE CITY OF OXFORD POST OFFICE BOX 3663 OXFORD, ALABAMA 36203	
FACILITY LOCATION:	OXFORD TULL C. ALLEN WWTP 2975 SILVER RUN ROAD OXFORD, ALABAMA TALLADEGA COUNTY	(4.50) MGD
PERMIT NUMBER:	AL0058408	
RECEIVING WATERS:	CHOCCOLOCCO CREEK	

In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251-1388 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 to 22-22A-17, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.

ISSUANCE DATE:

EFFECTIVE DATE:

EXPIRATION DATE:

Draft

Alabama Department of Environmental Management

MUNICIPAL SECTION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

TABLE OF CONTENTS

PART I DISCHARGE LIMITATIONS, CONDITIONS, AND REQUIREMENTS

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

1. Outfall 0011 Discharge Limits

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the Permittee is authorized to discharge from Outfall 0011, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
Turbidity 00070 1 0 0	*****	*****	REPORT NTU	*****	*****	REPORT NTU	*****	E	GRAB	B	*****
Oxygen, Dissolved (DO) 00300 1 0 0	*****	*****	*****	*****	6.0 mg/l	*****	*****	E	GRAB	C	*****
pH 00400 1 0 0	*****	*****	*****	*****	6.0 S.U.	9.0 S.U.	*****	E	GRAB	C	*****
Solids, Total Suspended 00530 1 0 0	1125 lbs/day	1688 lbs/day	30.0 mg/l	45.0 mg/l	*****	*****	*****	E	COMP24	C	*****
Solids, Total Suspended 00530 G 0 0	REPORT lbs/day	REPORT lbs/day	REPORT mg/l	REPORT mg/l	*****	*****	*****	I	COMP24	C	*****
Nitrogen, Ammonia Total (As N) 00610 1 0 0	37.5 lbs/day	56.2 lbs/day	1.0 mg/l	1.5 mg/l	*****	*****	*****	E	COMP24	C	S
Nitrogen, Ammonia Total (As N) 00610 1 0 0	750 lbs/day	1125 lbs/day	20.0 mg/l	30.0 mg/l	*****	*****	*****	E	COMP24	C	W
Nitrogen, Kjeldahl Total (As N) 00625 1 0 0	REPORT lbs/day	REPORT lbs/day	REPORT mg/l	REPORT mg/l	*****	*****	*****	E	COMP24	G See Note 5	*****
Nitrite Plus Nitrate Total 1 Det. (As N) 00630 1 0 0	REPORT lbs/day	REPORT lbs/day	REPORT mg/l	REPORT mg/l	*****	*****	*****	E	COMP24	G See Note 5	*****
Phosphorus, Total (As P) 00665 1 0 0	REPORT lbs/day	REPORT lbs/day	REPORT mg/l	REPORT mg/l	*****	*****	*****	E	COMP24	G See Note 5	*****
Silver Total Recoverable 01079 1 0 0	*****	*****	REPORT µg/l	*****	*****	REPORT µg/l	*****	E	GRAB	G See Note 5	*****
Color (ADMI Units) 01290 1 0 0	*****	*****	*****	*****	*****	80 ADMI	*****	E	GRAB	B	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) If only one sampling event occurs during a month, the sample result shall be reported on the DMR as both the monthly average, weekly average, and/or the daily maximum.

Limits for Outfall 0011 continued on the next page.

2. Outfall 0011 Discharge Limits (continued)

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the Permittee is authorized to discharge from Outfall 0011, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
Flow, In Conduit or Thru Treatment Plant 50050 1 0 0	REPORT MGD	*****	*****	*****	*****	REPORT MGD	*****	E	CONTIN	A	*****
Chlorine, Total Residual 50060 1 0 0	*****	*****	0.066 mg/l	*****	*****	0.115 mg/l	*****	E	GRAB	C See Note 5 & 6	*****
E. Coli 51040 1 0 0	*****	*****	126 col/100mL	*****	*****	298 col/100mL	*****	E	GRAB	B	ECS
E. Coli 51040 1 0 0	*****	*****	548 col/100mL	*****	*****	2507 col/100mL	*****	E	GRAB	B	ECW
Cyanide, Free Available 51173 1 0 0	*****	*****	31.4 µg/l	*****	*****	70.5 µg/l	*****	E	GRAB	G See Note 8	*****
Peracetic Acid 51674 1 0 0	*****	*****	*****	*****	*****	1.0 mg/l	*****	E	GRAB	B See Note 7	*****
BOD, Carbonaceous 05 Day, 20C 80082 1 0 0	300 lbs/day	450 lbs/day	8.0 mg/l	12.0 mg/l	*****	*****	*****	E	COMP24	C	S
BOD, Carbonaceous 05 Day, 20C 80082 1 0 0	938 lbs/day	1407 lbs/day	25.0 mg/l	37.5 mg/l	*****	*****	*****	E	COMP24	C	W
BOD, Carbonaceous 05 Day, 20C 80082 G 0 0	REPORT lbs/day	REPORT lbs/day	REPORT mg/l	REPORT mg/l	*****	*****	*****	I	COMP24	C	*****
BOD, Carb-5 Day, 20 Deg C, Percent Remvl 80091 K 0 0	*****	*****	*****	*****	*****	*****	85.0%	K	CALCTD	G	*****
Solids, Suspended Percent Removal 81011 K 0 0	*****	*****	*****	*****	*****	*****	85.0%	K	CALCTD	G	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) See Part IV.C. for Total Residual Chlorine (TRC). Monitoring for TRC is applicable if chlorine is utilized for disinfection purposes. If monitoring is not applicable during the monitoring period, enter "*9" on the monthly DMR.

(6) A measurement of Total Residual Chlorine below 0.05 mg/L shall be considered in compliance with the permit limitations above and should be reported as NODI = B or * B on the discharge monitoring reports.

(7) See Part IV.F for Peracetic Acid (PAA). Monitoring for PAA is applicable if Peracetic Acid is utilized for disinfection purposes. If monitoring is not applicable during the monitoring period, enter "*9" on the monthly DMR.

(8) If only one sampling event occurs during a month, the sample result shall be reported on the DMR as both the monthly average, weekly average, and/or the daily maximum.

3. Outfall 001A Discharge Limits - Annually

Outfall 001A represents the same physical outfall as Outfall 0011. The Department uses the 001A designation for all samples and analyzed for Annual Testing, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
Mercury Total Recoverable 71901 1 0 0	*****	*****	REPORT µg/l	*****	*****	REPORT µg/l	*****	E	GRAB	J See Note 5	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream
US – Upstream
DS – Downstream
MW – Monitoring Well
SW – Storm Water

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) EPA Method 1631/1669E or alternative method specifically approved by the Department shall be used for analysis for this parameter.

4. Outfall 001T Discharge Limits

Outfall 001T represents the same physical outfall as Outfall 0011. The Department uses the 001T designation for all samples and analyzed for Toxicity testing, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
Toxicity, Ceriodaphnia Chronic 61426 1 0 0	*****	Pass = 0 Fail = 1	*****	*****	*****	*****	*****	E	COMP24	Q See Note 5	*****
Toxicity, Pimephales Chronic 61428 1 0 0	*****	Pass = 0 Fail = 1	*****	*****	*****	*****	*****	E	COMP24	Q See Note 5	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream
US – Upstream
DS – Downstream
MW – Monitoring Well
SW – Storm Water

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) See Parts IV.B.2.d and e (Toxicity testing without PAA utilization and with PAA utilization). Toxicity testing shall be required quarterly after initial utilization of PAA as stated in Part IV.B.2.e. Prior to initial utilization of PAA, toxicity testing shall be required annually as stated in Part IV.B.2.d of the Permit. If monitoring is not applicable during a quarterly monitoring period enter "*9" on the DMRs when toxicity testing is not required. Please indicate on the toxicity test reports the method of disinfection utilized during the test.

5. Outfall 002S Discharge Limits - Storm Water

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the Permittee is authorized to discharge from Outfall 002S. Outfall 002S will correspond to Outfall 001, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
pH 00400 SW 0 0	*****	*****	*****	*****	REPORT S.U.	REPORT S.U.	*****	SW	FFGS	J	*****
Solids, Total Suspended 00530 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Oil & Grease 00556 SW 0 0	*****	*****	*****	*****	*****	15.0 mg/l	*****	SW	FFGS	J	*****
Nitrogen, Ammonia Total (As N) 00610 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Nitrogen, Kjeldahl Total (As N) 00625 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Nitrite Plus Nitrate Total 1 Det. (As N) 00630 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Phosphorus, Total (As P) 00665 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Flow, In Conduit or Thru Treatment Plant 50050 SW 0 0	*****	*****	*****	*****	*****	REPORT MGD	*****	SW	CALCTD	J	*****
E. Coli 51040 SW 0 0	*****	*****	*****	*****	*****	REPORT col/100mL	*****	SW	FFGS	J	*****
BOD, Carbonaceous 05 Day, 20C 80082 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream
SW – Storm Water

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) See Note Part IV.H.3.

(6) For all storm water parameters, samples shall be first flushed grab samples (FFGS) collected during the first 30 minutes of discharge.

6. Outfall 003S Discharge Limits - Storm Water

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the Permittee is authorized to discharge from Outfall 003S. Outfall 003S will correspond to 002, which is described more fully in the Permittee's application. Such discharge shall be limited and monitored by the Permittee as specified below:

Parameter	Discharge Limitations*							Monitoring Requirements**			
	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Percent Removal	(1) Sample Location	(2) Sample Type	(3) Measurement Frequency	(4) Seasonal
pH 00400 SW 0 0	*****	*****	*****	*****	REPORT S.U.	REPORT S.U.	*****	SW	FFGS	J	*****
Solids, Total Suspended 00530 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Oil & Grease 00556 SW 0 0	*****	*****	*****	*****	*****	15.0 mg/l	*****	SW	FFGS	J	*****
Nitrogen, Ammonia Total (As N) 00610 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Nitrogen, Kjeldahl Total (As N) 00625 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Nitrite Plus Nitrate Total 1 Det. (As N) 00630 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Phosphorus, Total (As P) 00665 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****
Flow, In Conduit or Thru Treatment Plant 50050 SW 0 0	*****	*****	*****	*****	*****	REPORT MGD	*****	SW	CALCTD	J	*****
E. Coli 51040 SW 0 0	*****	*****	*****	*****	*****	REPORT col/100mL	*****	SW	FFGS	J	*****
BOD, Carbonaceous 05 Day, 20C 80082 SW 0 0	*****	*****	*****	*****	*****	REPORT mg/l	*****	SW	FFGS	J	*****

* See Part II.C.1. (Bypass); Part II.C.2. (Upset)
** Monitoring Requirements

(1) Sample Location
I – Influent
E – Effluent
X – End Chlorine Contact Chamber
K - Percent Removal of the Monthly Avg. Influent Concentration from the Monthly Avg. Effluent Concentration.
RS - Receiving Stream
SW – Storm Water

(2) Sample Type:
CONTIN - Continuous
INSTAN - Instantaneous
COMP-8 - 8-Hour Composite
COMP24 - 24-Hour Composite
GRAB – Grab
CALCTD - Calculated

(3) Measurement Frequency: See also Part I.B.2.
A - 7 days per week
B - 5 days per week
C - 3 days per week
D - 2 days per week
E - 1 day per week
F - 2 days per month
G - 1 day per month
H - 1 day per quarter
J - Annual
Q - For Effluent Toxicity Testing, see Provision IV.B.

(4) Seasonal Limits:
S = Summer (May – November)
W = Winter (December - April)
ECS = E. coli Summer (May – October)
ECW = E. coli Winter (November – April)

(5) See Note Part IV.H.3.

(6) For all storm water parameters, samples shall be first flushed grab samples (FFGS) collected during the first 30 minutes of discharge.

B. DISCHARGE MONITORING AND RECORD KEEPING REQUIREMENTS

1. Representative Sampling

   Sample collection and measurement actions shall be representative of the volume and nature of the monitored discharge and shall be in accordance with the provisions of this permit. The effluent sampling point shall be at the nearest accessible location just prior to discharge and after final treatment, unless otherwise specified in the permit.

2. Measurement Frequency

   Measurement frequency requirements found in Provision I.A. shall mean:

   a. Seven days per week shall mean daily.

   b. Five days per week shall mean any five days of discharge during a calendar weekly period of Sunday through Saturday.

   c. Three days per week shall mean any three days of discharge during a calendar week.

   d. Two days per week shall mean any two days of discharge during a calendar week.

   e. One day per week shall mean any day of discharge during a calendar week.

   f. Two days per month shall mean any two days of discharge during the month that are no less than seven days apart. However, if discharges occur only during one seven-day period in a month, then two days per month shall mean any two days of discharge during that seven day period.

   g. One day per month shall mean any day of discharge during the calendar month.

   h. Quarterly shall mean any day of discharge during each calendar quarter.

   i. The Permittee may increase the frequency of sampling, listed in Provisions I.B.2.a through I.B.2.h; however, all sampling results are to be reported to the Department.

3. Test Procedures

   For the purpose of reporting and compliance, Permittees shall use one of the following procedures:

   a. For parameters with an EPA established Minimum Level (ML), report the measured value if the analytical result is at or above the ML and report "0" for values below the ML. Test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and guidelines published pursuant to Section 304(h) of the FWPCA, 33 U.S.C. Section 1314(h). If more than one method for analysis of a substance is approved for use, a method having a minimum level lower than the permit limit shall be used. If the minimum level of all methods is higher than the permit limit, the method having the lowest minimum level shall be used and a report of less than the minimum level shall be reported as zero and will constitute compliance, however should EPA approve a method with a lower minimum level during the term of this permit the Permittee shall use the newly approved method.

   b. For pollutants parameters without an established ML, an interim ML may be utilized. The interim ML shall be calculated as 3.18 times the Method Detection Level (MDL) calculated pursuant to 40 CFR Part 136, Appendix B.

      Permittees may develop an effluent matrix-specific ML, where an effluent matrix prevents attainment of the established ML. However, a matrix specific ML shall be based upon proper laboratory method and technique. Matrix-specific MLs must be approved by the Department, and may be developed by the Permittee during permit issuance, reissuance, modification, or during compliance schedule.

      In either case the measured value should be reported if the analytical result is at or above the ML and "0" reported for values below the ML.

   c. For parameters without an EPA established ML, interim ML, or matrix-specific ML, a report of less than the detection limit shall constitute compliance if the detection limit of all analytical methods is higher than the permit limit. For the purpose of calculating a monthly average, "0" shall be used for values reported less than the detection limit.

      The Minimum Level utilized for procedures a and b above shall be reported on the Permittee's DMR. When an EPA approved test procedure for analysis of a pollutant does not exist, the Director shall approve the procedure to be used.

4. Recording of Results

   For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:

   a. The facility name and location, point source number, date, time and exact place of sampling;

b. The name(s) of person(s) who obtained the samples or measurements;

c. The dates and times the analyses were performed;

d. The name(s) of the person(s) who performed the analyses;

e. The analytical techniques or methods used, including source of method and method number; and

f. The results of all required analyses.

5. Records Retention and Production

a. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the above reports or the application for this permit, for a period of at least three years from the date of the sample measurement, report or application. This period may be extended by request of the Director at any time. If litigation or other enforcement action, under the AWPCA and/or the FWPCA, is ongoing which involves any of the above records, the records shall be kept until the litigation is resolved. Upon the written request of the Director or his designee, the Permittee shall provide the Director with a copy of any record required to be retained by this paragraph. Copies of these records should not be submitted unless requested.

b. All records required to be kept for a period of three years shall be kept at the permitted facility or an alternate location approved by the Department in writing and shall be available for inspection.

6. Reduction, Suspension or Termination of Monitoring and/or Reporting

a. The Director may, with respect to any point source identified in Provision I.A. of this permit, authorize the Permittee to reduce, suspend or terminate the monitoring and/or reporting required by this permit upon the submission of a written request for such reduction, suspension or termination by the Permittee, supported by sufficient data which demonstrates to the satisfaction of the Director that the discharge from such point source will continuously meet the discharge limitations specified in Provision I.A. of this permit.

b. It remains the responsibility of the Permittee to comply with the monitoring and reporting requirements of this permit until written authorization to reduce, suspend or terminate such monitoring and/or reporting is received by the Permittee from the Director.

7. Monitoring Equipment and Instrumentation

All equipment and instrumentation used to determine compliance with the requirements of this permit shall be installed, maintained, and calibrated in accordance with the manufacturer's instructions or, in the absence of manufacturer's instructions, in accordance with accepted practices. At a minimum, flow measurement devices shall be calibrated at least once every 12 months.

C. DISCHARGE REPORTING REQUIREMENTS

1. Reporting of Monitoring Requirements

a. The Permittee shall conduct the required monitoring in accordance with the following schedule:

(1) **MONITORING REQUIRED MORE FREQUENTLY THAN MONTHLY AND MONTHLY** shall be conducted during the first full month following the effective date of coverage under this permit and every month thereafter.

(2) **QUARTERLY MONITORING** shall be conducted at least once during each calendar quarter. Calendar quarters are the periods of January through March, April through June, July through September, and October through December. The Permittee shall conduct the quarterly monitoring during the first complete calendar quarter following the effective date of this permit and is then required to monitor once during each quarter thereafter. Quarterly monitoring should be reported on the last DMR due for the quarter (i.e., March, June, September and December DMRs).

(3) **SEMIANNUAL MONITORING** shall be conducted at least once during the period of January through June and at least once during the period of July through December. The Permittee shall conduct the semiannual monitoring during the first complete calendar semiannual period following the effective date of this permit and is then required to monitor once during each semiannual period thereafter. Semiannual monitoring may be done anytime during the semiannual period, unless restricted elsewhere in this permit, but it should be reported on the last DMR due for the month of the semiannual period (i.e., June and December DMRs).

(4) **ANNUAL MONITORING** shall be conducted at least once during the period of January through December. The Permittee shall conduct the annual monitoring during the first complete calendar annual period following the effective date of this permit and is then required to monitor once during each annual period thereafter.

Annual monitoring may be done anytime during the year, unless restricted elsewhere in this permit, but it should be reported on the December DMR.

b. The Permittee shall submit discharge monitoring reports (DMRs) on the forms approved by the Department and in accordance with the following schedule:

(1) **REPORTS OF MORE FREQUENTLY THAN MONTHLY AND MONTHLY TESTING** shall be submitted on a monthly basis. The first report is due on the 28th day of the month following the month the permit becomes effective. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period, unless otherwise directed by the Department.

(2) **REPORTS OF QUARTERLY TESTING** shall be submitted on a quarterly basis. The first report is due on the 28th day of the month following the month the permit becomes effective. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period, unless otherwise directed by the Department.

(3) **REPORTS OF SEMIANNUAL TESTING** shall be submitted on a semiannual basis. The reports are due on the 28th day of JANUARY and the 28th day of JULY. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period, unless otherwise directed by the Department.

(4) **REPORTS OF ANNUAL TESTING** shall be submitted on an annual basis. Unless specified elsewhere in the permit, the first report is due on the 28th day of JANUARY. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period, unless otherwise directed by the Department.

c. Except as allowed by Provision I.C.1.c.(1) or (2), the permittee shall submit all Discharge Monitoring Reports (DMRs) required by Provision I.C.1.b. by utilizing the Department's web-based Electronic Environmental (E2) Reporting System.

(1) If the permittee is unable to complete the electronic submittal of DMR data due to technical problems originating with the Department's E2 Reporting System (this could include entry/submittal issues with an entire set of DMRs or individual parameters), the permittee is not relieved of their obligation to submit DMR data to the Department by the date specified in Provision I.C.1.b., unless otherwise directed by the Department.

If the E2 Reporting System is down on the 28th day of the month in which the DMR is due or is down for an extended period of time, as determined by the Department, when a DMR is required to be submitted, the permittee may submit the data in an alternate manner and format acceptable to the Department. Preapproved alternate acceptable methods include faxing, e-mailing, mailing, or hand-delivery of data such that they are received by the required reporting date. Within five calendar days of the E2 Reporting System resuming operation, the permittee shall enter the data into the E2 Reporting System, unless an alternate timeframe is approved by the Department. An attachment should be included with the E2 DMR submittal verifying the original submittal date (date of the fax, copy of dated e-mail, or hand-delivery stamped date), if applicable.

(2) The permittee may submit a request to the Department for a temporary electronic reporting waiver for DMR submittals. The waiver request should include the permit number; permittee name; facility/site name; facility address; name, address, and contact information for the responsible official or duly authorized representative; a detailed statement regarding the basis for requesting such a waiver; and the duration for which the waiver is requested. Approved electronic reporting waivers are not transferrable.

A permittee with an approved electronic reporting waiver for DMRs may submit hard copy DMRs for the period that the approved electronic reporting waiver request is effective. The permittee shall submit the Department-approved DMR forms to the address listed in Provision I.C.1.e.

(3) If a permittee is allowed to submit a hard copy DMR, the DMR must be legible and bear an original signature. Photo and electronic copies of the signature are not acceptable and shall not satisfy the reporting requirements of this permit.

(4) If the permittee, using approved analytical methods as specified in Provision I.B.2, monitors any discharge from a point source for a limited substance identified in Provision I.A. of this permit more frequently than required by this permit, the results of such monitoring shall be included in the calculation and reporting of values on the DMR and the increased frequency shall be indicated on the DMR.

(5) In the event no discharge from a point source identified in Provision I.A. of this permit and described more fully in the permittee's application occurs during a monitoring period, the permittee shall report "No Discharge" for such period on the appropriate DMR.

d. All reports and forms required to be submitted by this permit, the AWPCA and the Department's Rules and Regulations, shall be electronically signed (or, if allowed by the Department, traditionally signed) by a "responsible

official" of the permittee as defined in ADEM Administrative Code Rule 335-6-6-.09 or a "duly authorized representative" of such official as defined in ADEM Administrative Code Rule 335-6-6-.09 and shall bear the following certification:

> **"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 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."**

e. Discharge Monitoring Reports required by this permit, the AWPCA, and the Department's Rules that are being submitted in hard copy shall be addressed to:

Alabama Department of Environmental Management
Environmental Data Section, Permits & Services Division
Post Office Box 301463
Montgomery, Alabama 36130-1463

Certified and Registered Mail containing Discharge Monitoring Reports shall be addressed to:

Alabama Department of Environmental Management
Environmental Data Section, Permits & Services Division
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2400

f. All other correspondence and reports required to be submitted by this permit, the AWPCA, and the Department's Rules shall be addressed to:

Alabama Department of Environmental Management
Municipal Section, Water Division
Post Office Box 301463
Montgomery, Alabama 36130-1463

Certified and Registered Mail shall be addressed to:

Alabama Department of Environmental Management
Municipal Section, Water Division
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2400

g. If this permit is a reissuance, then the permittee shall continue to submit DMRs in accordance with the requirements of their previous permit until such time as DMRs are due as discussed in Part I.C.1.b. above.

2. Noncompliance Notifications and Reports

a. The Permittee shall notify the Department if, for any reason, the Permittee's discharge:

(1) Does not comply with any daily minimum or maximum discharge limitation for an effluent characteristic specified in Provision I.A. of this permit which is denoted by an "(X)";

(2) Potentially threatens human health or welfare;

(3) Threatens fish or aquatic life;

(4) Causes an in-stream water quality criterion to be exceeded;

(5) Does not comply with an applicable toxic pollutant effluent standard or prohibition established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a);

(6) Contains a quantity of a hazardous substance that may be harmful to public health or welfare under Section 311(b)(4) of the FWPCA, 33 U.S.C. Section 1321(b)(4);

(7) Exceeds any discharge limitation for an effluent parameter listed in Part I.A. as a result of an unanticipated bypass or upset; or

(8) Is an unpermitted direct or indirect discharge of a pollutant to a water of the state. (Note that unpermitted discharges properly reported to the Department under any other requirement are not required to be reported under this provision.)

The Permittee shall orally or electronically provide notification of any of the above occurrences, describing the circumstances and potential effects, to the Director or Designee within 24-hours after the Permittee becomes aware of the occurrence of such discharge. In addition to the oral or electronic notification, the Permittee shall submit a report to the Director or Designee, as provided in Provision I.C.2.c. or I.C.2.e., no later than five days after becoming aware of the occurrence of such discharge or occurrence.

b. If, for any reason, the Permittee's discharge does not comply with any limitation of this permit, then the Permittee shall submit a written report to the Director or Designee, as provided in Provision I.C.2.c below. This report must be submitted with the next Discharge Monitoring Report required to be submitted by Provision I.C.1 of this permit after becoming aware of the occurrence of such noncompliance.

c. Except for notifications and reports of notifiable SSOs which shall be submitted in accordance with the applicable Provisions of this permit, the Permittee shall submit the reports required under Provisions I.C.2.a. and b. to the Director or Designee on ADEM Form 421, available on the Department's website (http://www.adem.state.al.us/DeptForms/Form421.pdf). The completed Form must document the following information:

(1) A description of the discharge and cause of noncompliance;

(2) The period of noncompliance, including exact dates, times, and duration of the noncompliance. If the noncompliance is not corrected by the due date of the written report, then the Permittee shall provide an estimated date by which the noncompliance will be corrected; and

(3) A description of the steps taken by the Permittee and the steps planned to be taken by the Permittee to reduce or eliminate the noncompliant discharge and to prevent its recurrence.

d. Immediate notification

The Permittee shall provide notification to the Director, the public, the county health department, and any other affected entity such as public water systems, as soon as possible upon becoming aware of any notifiable sanitary sewer overflow. Notification to the Director shall be completed utilizing the Department's web-based electronic environmental SSO reporting system in accordance with Provision I.C.2.e.

e. The Department is utilizing a web-based electronic environmental (E2) reporting system for notification and submittal of SSO reports. **If the Permittee is not already participating in the E2 Reporting System for SSO reports, the Permittee must apply for participation in the system within 30 days of coverage under this permit unless the Permittee submits in writing valid justification as to why it cannot participate and the Department approves in writing utilization of verbal notifications and hard copy SSO report submittals.** Once the Permittee is enrolled in the E2 Reporting System for SSO reports, the Permittee must utilize the system for notification and submittal of all SSO reports unless otherwise allowed by this permit. The Permittee shall include in the SSO reports the information requested by ADEM Form 415. In addition, the Permittee shall include the latititude and longitude of the SSO in the report except when the SSO is a result of an extreme weather event (e.g., hurricane). To participate in the E2 Reporting System for SSO reports, the Permittee Participation Package may be downloaded online at **https://e2.adem.alabama.gov/npdes**. If the E2 Reporting System is down (i.e., electronic submittal of SSO data cannot be completed due to technical problems originating with the Department's system), the Permittee is not relieved of its obligation to notify the Department or submit SSO reports to the Department by the required submittal date, and the Permittee shall submit the data in an alternate manner and format acceptable to the Department. Preapproved alternate acceptable methods include verbal reports, reports submitted via the SSO hotline, or reports submitted via fax, e-mail, mail, or hand-delivery such that they are received by the required reporting date. Within five calendar days of the E2 Reporting System resuming operation, the Permittee shall enter the data into the E2 Reporting System, unless an alternate timeframe is approved by the Department. For any alternate notification, records of the date, time, notification method, and person submitting the notification should be maintained by the Permittee. If a Permittee is allowed to submit SSO reports via an alternate method, the SSO report must be in a format approved by the Department and must be legible.

f. The Permittee shall maintain a record of all known wastewater discharge points that are not authorized as permitted outfalls, including but not limited to SSOs. The Permittee shall include this record in its Municipal Water Pollution Prevention (MWPP) Annual Reports, which shall be submitted to the Department each year by May 31st for the prior calendar year period beginning January 1st and ending December 31st. The MWPP Annual Reports shall contain a list of all known wastewater discharge points that are not authorized as permitted outfalls and any discharges that occur prior to the headworks of the wastewater treatment plant covered by this permit. The Permittee shall also provide in the MWPP Annual Reports a list of any discharges reported during the applicable time period in accordance with Provision I.C.2.a. The Permittee shall include in its MWPP Annual Reports the following information for each known unpermitted discharge that occurred:

(1) The cause of the discharge;

(2) Date, duration and volume of discharge (estimate if unknown);

(3) Description of the source (e.g., manhole, lift station);

(4) Location of the discharge, by latitude and longitude (or other appropriate method as approved by the Department);

(5) The ultimate destination of the flow (e.g., surface waterbody, municipal separate storm sewer to surface waterbody). Location should be shown on a USGS quad sheet or copy thereof; and

(6) Corrective actions taken and/or planned to eliminate future discharges.

D. OTHER REPORTING AND NOTIFICATION REQUIREMENTS

1. Anticipated Noncompliance

   The Permittee shall give the Director written advance notice of any planned changes or other circumstances regarding a facility which may result in noncompliance with permit requirements.

2. Termination of Discharge

   The Permittee shall notify the Director, in writing, when all discharges from any point source(s) identified in Provision I. A. of this permit have permanently ceased. This notification shall serve as sufficient cause for instituting procedures for modification or termination of the permit.

3. Updating Information

   a. The Permittee shall inform the Director of any change in the Permittee's mailing address or telephone number or in the Permittee's designation of a facility contact or office having the authority and responsibility to prevent and abate violations of the AWPCA, the Department's Rules and the terms and conditions of this permit, in writing, no later than ten (10) days after such change. Upon request of the Director or his designee, the Permittee shall furnish the Director with an update of any information provided in the permit application.

   b. If the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information with a written explanation for the mistake and/or omission.

4. Duty to Provide Information

   The Permittee shall furnish to the Director, within a reasonable time, any information which the Director or his designee may request to determine whether cause exists for modifying, revoking and re-issuing, suspending, or terminating this permit, in whole or in part, or to determine compliance with this permit.

E. SCHEDULE OF COMPLIANCE

1. Compliance with discharge limits

   The Permittee shall achieve compliance with the discharge limitations specified in Provision I. A. in accordance with the following schedule:

   COMPLIANCE SHALL BE ATTAINED ON THE EFFECTIVE DATE OF THIS PERMIT

2. Schedule

   No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

PART II OTHER REQUIREMENTS, RESPONSIBILITIES, AND DUTIES

A. OPERATIONAL AND MANAGEMENT REQUIREMENTS

1. Facilities Operation and Maintenance

   The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit.

2. Best Management Practices (BMP)

   a. Dilution water shall not be added to achieve compliance with discharge limitations except when the Director or his designee has granted prior written authorization for dilution to meet water quality requirements.

   b. The Permittee shall prepare, implement, and maintain a Spill Prevention, Control and Countermeasures (SPCC) Plan in accordance with 40 C.F.R. Section 112 if required thereby.

   c. The Permittee shall prepare, submit for approval and implement a BMP Plan for containment of any or all process liquids or solids, in a manner such that these materials do not present a significant potential for discharge, if so required by the Director or his designee. When submitted and approved, the BMP Plan shall become a part of this permit and all requirements of the BMP Plan shall become requirements of this permit.

3. Certified Operator

   The Permittee shall not operate any wastewater treatment plant unless the competency of the operator to operate such plant has been duly certified by the Director pursuant to AWPCA, and meets the requirements specified in ADEM Administrative Code, Rule 335-10-1.

B. OTHER RESPONSIBILITIES

1. Duty to Mitigate Adverse Impacts

   The Permittee shall promptly take all reasonable steps to mitigate and minimize or prevent any adverse impact on human health or the environment resulting from noncompliance with any discharge limitation specified in Provision I. A. of this permit, including such accelerated or additional monitoring of the discharge and/or the receiving waterbody as necessary to determine the nature and impact of the noncomplying discharge.

2. Right of Entry and Inspection

   The Permittee shall allow the Director, or an authorized representative, upon the presentation of proper credentials and other documents as may be required by law to:

   (1) Enter upon the Permittee's premises where a regulated facility or activity or point source is located or conducted, or where records must be kept under the conditions of the permit;

   (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permits;

   (3) Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the permit; and

   (4) Sample or monitor, for the purposes of assuring permit compliance or as otherwise authorized by the AWPCA, any substances or parameters at any location.

C. BYPASS AND UPSET

1. Bypass

   a. Any bypass is prohibited except as provided in b. and c. below:

   b. A bypass is not prohibited if:

      (1) It does not cause any discharge limitation specified in Provision I. A. of this permit to be exceeded;

      (2) It enters the same receiving stream as the permitted outfall; and

      (3) It is necessary for essential maintenance of a treatment or control facility or system to assure efficient operation of such facility or system.

   c. A bypass is not prohibited and need not meet the discharge limitations specified in Provision I. A. of this permit if:

      (1) It is unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime (this condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance); and

(3) The Permittee submits a written request for authorization to bypass to the Director at least ten (10) days prior to the anticipated bypass (if possible), the Permittee is granted such authorization, and the Permittee complies with any conditions imposed by the Director to minimize any adverse impact on human health or the environment resulting from the bypass.

d. The Permittee has the burden of establishing that each of the conditions of Provision II. C. 1. b. or c. have been met to qualify for an exception to the general prohibition against bypassing contained in a. and an exemption, where applicable, from the discharge limitations specified in Provision I. A. of this permit.

2. Upset

a. A discharge which results from an upset need not meet the discharge limitations specified in Provision I. A. of this permit if:

(1) No later than 24-hours after becoming aware of the occurrence of the upset, the Permittee orally reports the occurrence and circumstances of the upset to the Director or his designee; and

(2) No later than five (5) days after becoming aware of the occurrence of the upset, the Permittee furnishes the Director with evidence, including properly signed, contemporaneous operating logs, or other relevant evidence, demonstrating that:

(i) An upset occurred;

(ii) The Permittee can identify the specific cause(s) of the upset;

(iii) The Permittee's facility was being properly operated at the time of the upset; and

(iv) The Permittee promptly took all reasonable steps to minimize any adverse impact on human health or the environment resulting from the upset.

b. The Permittee has the burden of establishing that each of the conditions of Provision II C. 2. a. of this permit have been met to qualify for an exemption from the discharge limitations specified in Provision I. A. of this permit.

D. DUTY TO COMPLY WITH PERMIT, RULES, AND STATUTES

1. Duty to Comply

a. The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the AWPCA and the FWPCA and is grounds for enforcement action, for permit termination, revocation and reissuance, suspension, modification, or denial of a permit renewal application.

b. The necessity to halt or reduce production or other activities in order to maintain compliance with the conditions of the permit shall not be a defense for a Permittee in an enforcement action.

c. The discharge of a pollutant from a source not specifically identified in the permit application for this permit and not specifically included in the description of an outfall in this permit is not authorized and shall constitute noncompliance with this permit.

d. The Permittee shall take all reasonable steps, including cessation of production or other activities, to minimize or prevent any violation of this permit or to minimize or prevent any adverse impact of any permit violation.

e. Nothing in this permit shall be construed to preclude or negate the Permittee's responsibility to apply for, obtain, or comply with other Federal, State, or Local Government permits, certifications,or licenses or to preclude from obtaining other federal, state, or local approvals, including those applicable to other ADEM programs and regulations.

2. Removed Substances

Solids, sludges, filter backwash, or any other pollutant or other waste removed in the course of treatment or control of wastewaters shall be disposed of in a manner that complies with all applicable Department Rules.

3. Loss or Failure of Treatment Facilities

Upon the loss or failure of any treatment facilities, including but not limited to the loss or failure of the primary source of power of the treatment facility, the Permittee shall, where necessary to maintain compliance with the discharge limitations specified in Provision I. A. of this permit, or any other terms or conditions of this permit, cease, reduce, or otherwise control production and/or all discharges until treatment is restored. If control of discharge during loss or failure of the

primary source of power is to be accomplished by means of alternate power sources, standby generators, or retention of inadequately treated effluent, the Permittee must furnish to the Director within six months a certification that such control mechanisms have been installed.

4. Compliance With Statutes and Rules

   a. This permit has been issued under ADEM Administrative Code, Chapter 335-6-6. All provisions of this chapter, that are applicable to this permit, are hereby made a part of this permit. A copy of this chapter may be obtained for a small charge from the Office of General Counsel, Alabama Department of Environmental Management, 1400 Coliseum Boulevard Montgomery, Alabama 36110-2059.

   b. This permit does not authorize the noncompliance with or violation of any Laws of the State of Alabama or the United States of America or any regulations or rules implementing such laws. FWPCA, 33 U.S.C. Section 1319, and Code of Alabama 1975, Section 22-22-14.

E. PERMIT TRANSFER, MODIFICATION, SUSPENSION, REVOCATION, AND REISSUANCE

1. Duty to Reapply or Notify of Intent to Cease Discharge

   a. If the Permittee intends to continue to discharge beyond the expiration date of this permit, the Permittee shall file a complete permit application for reissuance of this permit at least 180 days prior to its expiration. If the Permittee does not intend to continue discharge beyond the expiration of this permit, the Permittee shall submit written notification of this intent which shall be signed by an individual meeting the signatory requirements for a permit application as set forth in ADEM Administrative Code Rule 335-6-6-.09.

   b. Failure of the Permittee to apply for reissuance at least 180 days prior to permit expiration will void the automatic continuation of the expiring permit provided by ADEM Administrative Code Rule 335-6-6-.06 and should the permit not be reissued for any reason any discharge after expiration of this permit will be an unpermitted discharge.

2. Change in Discharge

   Prior to any facility expansion, process modification or any significant change in the method of operation of the Permittee's treatment works, the Permittee shall provide the Director with information concerning the planned expansion, modification or change. The Permittee shall apply for a permit modification at least 180 days prior to any facility expansion, process modification, any significant change in the method of operation of the Permittee's treatment works or other actions that could result in the discharge of additional pollutants or increase the quantity of a discharged pollutant or could result in an additional discharge point. This condition applies to pollutants that are or that are not subject to discharge limitations in this permit. No new or increased discharge may begin until the Director has authorized it by issuance of a permit modification or a reissued permit.

3. Transfer of Permit

   This permit may not be transferred or the name of the Permittee changed without notice to the Director and subsequent modification or revocation and reissuance of the permit to identify the new Permittee and to incorporate any other changes as may be required under the FWPCA or AWPCA. In the case of a change in name, ownership or control of the Permittee's premises only, a request for permit modification in a format acceptable to the Director is required at least 30 days prior to the change. In the case of a change in name, ownership or control of the Permittee's premises accompanied by a change or proposed change in effluent characteristics, a complete permit application is required to be submitted to the Director at least 180 days prior to the change. Whenever the Director is notified of a change in name, ownership or control, he may decide not to modify the existing permit and require the submission of a new permit application.

4. Permit Modification and Revocation

   a. This permit may be modified or revoked and reissued, in whole or in part, during its term for cause, including but not limited to, the following:

      (1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to revoke and reissue this permit instead of terminating the permit;

      (2) If a request to transfer this permit has been received, the Director may decide to revoke and reissue or to modify the permit; or

      (3) If modification or revocation and reissuance is requested by the Permittee and cause exists, the Director may grant the request.

   b. This permit may be modified during its term for cause, including but not limited to, the following:

      (1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to modify this permit instead of terminating this permit;

(2) There are material and substantial alterations or additions to the facility or activity generating wastewater which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit;

(3) The Director has received new information that was not available at the time of permit issuance and that would have justified the application of different permit conditions at the time of issuance;

(4) A new or revised requirement(s) of any applicable standard or limitation is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA;

(5) Errors in calculation of discharge limitations or typographical or clerical errors were made;

(6) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued;

(7) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, permits may be modified to change compliance schedules;

(8) To agree with a granted variance under 301(c), 301(g), 301(h), 301(k), or 316(a) of the FWPCA or for fundamentally different factors;

(9) To incorporate an applicable 307(a) FWPCA toxic effluent standard or prohibition;

(10) When required by the reopener conditions in this permit;

(11) When required under 40 CFR 403.8(e) (compliance schedule for development of pretreatment program);

(12) Upon failure of the state to notify, as required by Section 402(b)(3) of the FWPCA, another state whose waters may be affected by a discharge permitted by this permit;

(13) When required to correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions; or

(14) When requested by the Permittee and the Director determines that the modification has cause and will not result in a violation of federal or state law, regulations or rules.

5. Termination

This permit may be terminated during its term for cause, including but not limited to, the following:

a. Violation of any term or condition of this permit;

b. The Permittee's misrepresentation or failure to disclose fully all relevant facts in the permit application or during the permit issuance process or the Permittee's misrepresentation of any relevant facts at any time;

c. Materially false or inaccurate statements or information in the permit application or the permit;

d. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

e. The Permittee's discharge threatens human life or welfare or the maintenance of water quality standards;

f. Permanent closure of the facility generating the wastewater permitted to be discharged by this permit or permanent cessation of wastewater discharge;

g. New or revised requirements of any applicable standard or limitation that is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA that the Director determines cannot be complied with by the Permittee; or

h. Any other cause allowed by the ADEM Administrative Code, Chapter 335-6-6.

6. Suspension

This permit may be suspended during its term for noncompliance until the Permittee has taken action(s) necessary to achieve compliance.

7. Stay

The filing of a request by the Permittee for modification, suspension or revocation of this permit, in whole or in part, does not stay any permit term or condition.

F. COMPLIANCE WITH TOXIC POLLUTANT STANDARD OR PROHIBITION

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a), for a toxic pollutant discharged by the Permittee, and such standard or prohibition is more stringent than any discharge limitation on the pollutant specified in Provision I. A. of this permit or controls a pollutant not limited in Provision I. A. of this permit, this permit shall be modified to conform to the toxic pollutant effluent standard or prohibition, and the Permittee shall be notified of such modification. If this permit has not been modified to conform to the toxic pollutant effluent standard or prohibition before the effective date of such standard or prohibition, the Permittee shall attain compliance with the requirements of the standard or prohibition within the time period required by the standard or prohibition and shall continue to comply with the standard or prohibition until this permit is modified or reissued.

G. NOTICE TO DIRECTOR OF INDUSTRIAL USERS

1. The Permittee shall not allow the introduction of wastewater, other than domestic wastewater, from a new direct discharger prior to approval and permitting, if applicable, of the discharge by the Department.
2. The Permittee shall not allow an existing indirect discharger to increase the quantity or change the character of its wastewater, other than domestic wastewater, prior to approval and permitting, if applicable, of the increased discharge by the Department.
3. The Permittee shall report to the Department any adverse impact caused or believed to be caused by an indirect discharger on the treatment process, quality of discharged water, or quality of sludge. Such report shall be submitted within seven days of the Permittee becoming aware of the adverse impacts.

H. PROHIBITIONS

The Permittee shall not allow, and shall take effective enforcement action to prevent and terminate, the introduction of any of the following into its treatment works by industrial users:

1. Pollutants which create a fire or explosion hazard in the treatment works;
2. Pollutants which will cause corrosive structural damage to the treatment works, or dischargers with a pH lower than 5.0 s.u., unless the works are specifically designed to accommodate such discharges;
3. Solid or viscous pollutants in amounts which will cause obstruction of flow in sewers, or other interference with the treatment works;
4. Pollutants, including oxygen demanding pollutants, released in a discharge of such volume or strength as to cause interference in the treatment works;
5. Heat in amounts which will inhibit biological activity in the treatment plant resulting in interference or in such quantities that the temperature of the treatment plant influent exceeds 40°C (104° F) unless the treatment plant is designed to accommodate such heat; and
6. Pollutants in amounts which exceed any applicable pretreatment standard under Section 307 of FWPCA or any approved revisions thereof.

PART III ADDITIONAL REQUIREMENTS, CONDITIONS, AND LIMITATIONS

A. CIVIL AND CRIMINAL LIABILITY

1. Tampering

   Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained or performed under the permit shall, upon conviction, be subject to penalties as provided by the AWPCA.

2. False Statements

   Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be subject to penalties as provided by the AWPCA.

3. Permit Enforcement

   a. Any NPDES permit issued or reissued by the Department is a permit for the purpose of the AWPCA and the FWPCA, and as such, any terms, conditions, or limitations of the permit are enforceable under state and federal law.

   b. Any person required to have a NPDES permit pursuant to ADEM Administrative Code Chapter 335-6-6 and who discharges pollutants without said permit, who violates the conditions of said permit, who discharges pollutants in a manner not authorized by the permit, or who violates applicable orders of the Department or any applicable rule or standard of the Department, is subject to any one or combination of the following enforcement actions under applicable state statutes:

      (1) An administrative order requiring abatement, compliance, mitigation, cessation, clean-up, and/or penalties;

      (2) An action for damages;

      (3) An action for injunctive relief; or

      (4) An action for penalties.

   c. If the Permittee is not in compliance with the conditions of an expiring or expired permit the Director may choose to do any or all of the following provided the Permittee has made a timely and complete application for reissuance of the permit:

      (1) Initiate enforcement action based upon the permit which has been continued;

      (2) Issue a notice of intent to deny the permit reissuance. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operating without a permit;

      (3) Reissue the new permit with appropriate conditions; or

      (4) Take other actions authorized by these rules and AWPCA.

4. Relief from Liability

   Except as provided in Provision II. C. 1. (Bypass) and Provision II. C. 2. (Upset), nothing in this permit shall be construed to relieve the Permittee of civil or criminal liability under the AWPCA or FWPCA for noncompliance with any term or condition of this permit.

B. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities or penalties to which the Permittee is or may be subject under Section 311 of the FWPCA, 33 U.S.C. Section 1321.

C. PROPERTY AND OTHER RIGHTS

This permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, or any infringement of federal, state, or local laws or regulations, nor does it authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any waters of the state or of the United States.

D. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Code of Alabama 1975, Section 22-22-9(c), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential.

E. EXPIRATION OF PERMITS FOR NEW OR INCREASED DISCHARGES

1. If this permit was issued for a new discharger or new source, this permit shall expire eighteen months after the issuance date if construction of the facility has not begun during the eighteen-month period.

2. If this permit was issued or modified to allow the discharge of increased quantities of pollutants to accommodate the modification of an existing facility and if construction of this modification has not begun during the eighteen month period after issuance of this permit or permit modification, this permit shall be modified to reduce the quantities of pollutants allowed to be discharged to those levels that would have been allowed if the modification of the facility had not been planned.

3. Construction has begun when the owner or operator has:

   a. Begun, or caused to begin as part of a continuous on-site construction program:

      (1) Any placement, assembly, or installation of facilities or equipment; or

      (2) Significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which are necessary for the placement, assembly, or installation of new source facilities or equipment; or

   b. Entered into a binding contractual obligation for the purpose of placement, assembly, or installation of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this paragraph.

4. Final plans and specifications for a waste treatment facility at a new source or new discharger, or a modification to an existing waste treatment facility must be submitted to and examined by the Department prior to initiating construction of such treatment facility by the Permittee.

5. Upon completion of construction of waste treatment facilities and prior to operation of such facilities, the Permittee shall submit to the Department a certification from a registered professional engineer, licensed to practice in the State of Alabama, that the treatment facilities have been built according to plans and specifications submitted to and examined by the Department.

F. COMPLIANCE WITH WATER QUALITY STANDARDS

1. On the basis of the Permittee's application, plans, or other available information, the Department has determined that compliance with the terms and conditions of this permit should assure compliance with the applicable water quality standards.

2. Compliance with permit terms and conditions notwithstanding, if the Permittee's discharge(s) from point sources identified in Provision I. A. of this permit cause or contribute to a condition in contravention of state water quality standards, the Department may require abatement action to be taken by the Permittee in emergency situations or modify the permit pursuant to the Department's Rules, or both.

3. If the Department determines, on the basis of a notice provided pursuant to this permit or any investigation, inspection or sampling, that a modification of this permit is necessary to assure maintenance of water quality standards or compliance with other provisions of the AWPCA or FWPCA, the Department may require such modification, and, in cases of emergency, the Director may prohibit the discharge until the permit has been modified.

G. GROUNDWATER

Unless specifically authorized under this permit, this permit does not authorize the discharge of pollutants to groundwater. Should a threat of groundwater contamination occur, the Director may require groundwater monitoring to properly assess the degree of the problem, and the Director may require that the Permittee undertake measures to abate any such discharge and/or contamination.

H. DEFINITIONS

1. Average monthly discharge limitation – means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

2. Average weekly discharge limitation - means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

3. Arithmetic Mean – means the summation of the individual values of any set of values divided by the number of individual values.
4. AWPCA – means the Alabama Water Pollution Control Act.
5. BOD – means the five-day measure of the pollutant parameter biochemical oxygen demand.
6. Bypass – means the intentional diversion of waste streams from any portion of a treatment facility.
7. CBOD – means the five-day measure of the pollutant parameter carbonaceous biochemical oxygen demand.
8. Daily discharge – means the discharge of a pollutant measured during any consecutive 24-hour period in accordance with the sample type and analytical methodology specified by the discharge permit.
9. Daily maximum – means the highest value of any individual sample result obtained during a day.
10. Daily minimum – means the lowest value of any individual sample result obtained during a day.
11. Day – means any consecutive 24-hour period.
12. Department – means the Alabama Department of Environmental Management.
13. Director – means the Director of the Department.
14. Discharge – means "[t]he addition, introduction, leaking, spilling or emitting of any sewage, industrial waste, pollutant or other waste into waters of the state". Code of Alabama 1975, Section 22-22-1(b)(9).
15. Discharge Monitoring Report (DMR) – means the form approved by the Director to accomplish reporting requirements of an NPDES permit.
16. DO – means dissolved oxygen.
17. 8HC – means 8-hour composite sample, including any of the following:
    a. The mixing of at least 8 equal volume samples collected at constant time intervals of not more than 1 hour over a period of not less than 8 hours between the hours of 6:00 a.m. and 6:00 p.m. If the sampling period exceeds 8 hours, sampling may be conducted beyond the 6:00 a.m. to 6:00 p.m. period.
    b. A sample continuously collected at a constant rate over period of not less than 8 hours between the hours of 6:00 a.m. and 6:00 p.m. If the sampling period exceeds 8 hours, sampling may be conducted beyond the 6:00 a.m. to 6:00 p.m. period.
18. EPA – means the United States Environmental Protection Agency.
19. FC – means the pollutant parameter fecal coliform.
20. Flow – means the total volume of discharge in a 24-hour period.
21. FWPCA – means the Federal Water Pollution Control Act.
22. Geometric Mean – means the Nth root of the product of the individual values of any set of values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered one (1).
23. Grab Sample – means a single influent or effluent portion which is not a composite sample. The sample(s) shall be collected at the period(s) most representative of the discharge.
24. Indirect Discharger – means a nondomestic discharger who discharges pollutants to a publicly owned treatment works or a privately owned treatment facility operated by another person.
25. Industrial User – means those industries identified in the Standard Industrial Classification manual, Bureau of the Budget 1967, as amended and supplemented, under the category "Division D – Manufacturing" and such other classes of significant waste producers as, by regulation, the Director deems appropriate.
26. MGD – means million gallons per day.
27. Monthly Average – means the arithmetic mean of all the composite or grab samples taken for the daily discharges collected in one month period. The monthly average for flow is the arithmetic mean of all flow measurements taken in a one month period.
28. New Discharger – means a person, owning or operating any building, structure, facility or installation:
    a. From which there is or may be a discharge of pollutants;
    b. From which the discharge of pollutants did not commence prior to August 13, 1979, and which is not a new source; and

c. Which has never received a final effective NPDES permit for dischargers at that site.

29. NH3-N – means the pollutant parameter ammonia, measured as nitrogen.

30. Notifiable sanitary sewer overflow – means an overflow, spill, release or diversion of wastewater from a sanitary sewer system that:

    a. Reaches a surface water of the State; or

    b. May imminently and substantially endanger human health based on potential for public exposure including but not limited to close proximity to public or private water supply wells or in areas where human contact would be likely to occur.

31. Permit application – means forms and additional information that is required by ADEM Administrative Code Rule 335-6-6-.08 and applicable permit fees.

32. Point source – means "any discernible, confined and discrete conveyance, including but not limited to any pipe, channel, ditch, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, . . . from which pollutants are or may be discharged." Section 502(14) of the FWPCA, 33 U.S.C. Section 1362(14).

33. Pollutant – includes for purposes of this permit, but is not limited to, those pollutants specified in Code of Alabama 1975, Section 22-22-1(b)(3) and those effluent characteristics specified in Provision I. A. of this permit.

34. Privately Owned Treatment Works – means any devices or system which is used to treat wastes from any facility whose operator is not the operator of the treatment works, and which is not a "POTW".

35. Publicly Owned Treatment Works – means a wastewater collection and treatment facility owned by the State, municipality, regional entity composed of two or more municipalities, or another entity created by the State or local authority for the purpose of collecting and treating municipal wastewater.

36. Receiving Stream – means the "waters" receiving a "discharge" from a "point source".

37. Severe property damage – means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

38. Significant Source – means a source which discharges 0.025 MGD or more to a POTW or greater than five percent of the treatment work's capacity, or a source which is a primary industry as defined by the U.S. EPA or which discharges a priority or toxic pollutant.

39. TKN – means the pollutant parameter Total Kjeldahl Nitrogen.

40. TON – means the pollutant parameter Total Organic Nitrogen.

41. TRC – means Total Residual Chlorine.

42. TSS – means the pollutant parameter Total Suspended Solids.

43. 24HC – means 24-hour composite sample, including any of the following:

    a. The mixing of at least 8 equal volume samples collected at constant time intervals of not more than 2 hours over a period of 24 hours;

    b. A sample collected over a consecutive 24-hour period using an automatic sampler composite to one sample. As a minimum, samples shall be collected hourly and each shall be no more than one twenty-fourth (1/24) of the total sample volume collected; or

    c. A sample collected over a consecutive 24-hour period using an automatic composite sampler composited proportional to flow.

44. Upset – means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit discharge limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

45. Waters – means "[a]ll waters of any river, stream, watercourse, pond, lake, coastal, ground, or surface water, wholly or partially within the state, natural or artificial. This does not include waters which are entirely confined and retained completely upon the property of a single individual, partnership, or corporation unless such waters are used in interstate commerce." Code of Alabama 1975, Section 22-22-1(b)(2). Waters "include all navigable waters" as defined in Section 502(7) of the FWPCA, 22 U.S.C. Section 1362(7), which are within the State of Alabama.

46. Week – means the period beginning at twelve midnight Saturday and ending at twelve midnight the following Saturday.

47. Weekly (7-day and calendar week) Average – is the arithmetic mean of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The calendar week is defined as beginning on Sunday and ending on Saturday. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for the calendar week shall be included in the data for the month that contains the Saturday.

I. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

PART IV SPECIFIC REQUIREMENTS, CONDITIONS, AND LIMITATIONS

A. SLUDGE MANAGEMENT PRACTICES

1. Applicability

   a. Provisions of Provision IV.A. apply to a sewage sludge generated or treated in treatment works that is applied to agricultural and non-agricultural land, or that is otherwise distributed, marketed, incinerated, or disposed in landfills or surface disposal sites.

   b. Provisions of Provision IV.A. do not apply to:

      (1) Sewage sludge generated or treated in a privately owned treatment works operated in conjunction with industrial manufacturing and processing facilities and which receive no domestic wastewater.

      (2) Sewage sludge that is stored in surface impoundments located at the treatment works prior to ultimate disposal.

2. Submitting Information

   a. If applicable, the Permittee must submit annually with its Municipal Water Pollution Prevention (MWPP) report the following:

      (1) Type of sludge stabilization/digestion method;

      (2) Daily or annual sludge production (dry weight basis);

      (3) Ultimate sludge disposal practice(s).

   b. The Permittee shall provide sludge inventory data to the Director as requested. These data may include, but are not limited to, sludge quantity and quality reported in Provision IV.A.2.a as well as other specific analyses required to comply with State and Federal laws regarding solid and hazardous waste disposal.

   c. The Permittee shall give prior notice to the Director of at least 30 days of any change planned in the Permittee's sludge disposal practices.

3. Reopener or Modification

   a. Upon review of information provided by the Permittee as required by Provision IV.A.2. or, based on the results of an on-site inspection, the permit shall be subject to modification to incorporate appropriate requirements.

   b. If an applicable "acceptable management practice" or if a numerical limitation for a pollutant in sewage sludge promulgated under Section 405 of FWPCA is more stringent than the sludge pollutant limit or acceptable management practice in this permit. This permit shall be modified or revoked or reissued to conform to requirements promulgated under Section 405. The Permittee shall comply with the limitations no later than the compliance deadline specified in applicable regulations as required by Section 405 of FWPCA.

B. EFFLUENT TOXICITY LIMITATIONS AND BIOMONITORING REQUIREMENTS FOR CHRONIC TOXICITY

1. Chronic Toxicity Test

   a. The permittee shall perform short-term chronic toxicity tests on the wastewater at Outfall 001.

   b. The samples shall be diluted using appropriate control water to the Instream Waste Concentration (IWC) which is **27 percent** effluent. The IWC is the actual concentration of effluent, after mixing, in the receiving stream during a 7-day, 10-year low flow period.

   c. Any test result that shows a statistically significant reduction in survival, growth, or reproduction between the control and test samples at the 95% confidence level indicates chronic toxicity and shall constitute noncompliance with this permit.

2. General Test Requirements

   a. A minimum of three (3) 24-hour composite samples shall be obtained for use in the above biomonitoring tests. Samples shall be collected every other day so that the laboratory receives water samples on the first, third, and fifth day of the seven-day test period. The holding time for each composite sample shall not exceed 36 hours. The control water shall be a water prepared in the laboratory in accordance with the EPA procedure described in EPA 821-R-02-013 (most current edition) or another control water selected by the Permittee and approved by the Department.

   b. Test results shall be deemed unacceptable and the Permittee shall rerun the tests as soon as practical within the monitoring period for the following:

      (1) For testing with P. promelas:, effluent toxicity tests with control survival of less than 80% or if dry weight per surviving control organism is less than 0.25 mg;

(2) For testing with C. dubia:, if the number of young per surviving control organism is less than 15 or if less than 60% of surviving control females produce three broods; or

(3) If the other requirements of the EPA Test Procedure are not met.

c. In the event of an invalid test, upon subsequent completion of a valid test, the results of all tests, valid and invalid, are to be reported to the Department along with an explanation of the tests performed and the test results.

d. Prior to intital use of PAA, toxicity tests shall be conducted in the month of **AUGUST**. Should results from the Annual Toxicity test indicate that Outfall **001T** exhibits chronic toxicity, then the Permittee must conduct the follow-up testing described in Part IV.B.4.a. In addition, the Permittee may then also be required to conduct toxicity testing in the months of FEBRUARY, MAY, AUGUST, and NOVEMBER.

e. **Within 30 days from initial utilization of Peracetic Acid (PAA) the Permittee must perform a toxicity test and submit the report to the Department, as required by Provision IV.B.** Toxicity tests shall be conducted quarterly in the months of **FEBRUARY, MAY, AUGUST, AND NOVEMBER**. Should results from the Quarterly Toxicity test indicate that Outfall **001T** exhibits chronic toxicity, then the Permittee must conduct the follow-up testing described in Parts IV.B.4.a and b. Should results from four consecutive testing periods indicated that Outfall 001T does not exhibit chronic toxicity while utilizing PAA, the Permittee may provide a written request to reduce the testing frequency. **The Permittee may also request reduced toxicity testing frequency if PAA usage is not utilized for an extended period of time. Any reduction in test frequency must be approved by the Department in writing and shall be no less than frequent than annually.**

3. Reporting Requirements

a. The Permittee shall notify the Department in writing within 48 hours after toxicity has been demonstrated by the scheduled test(s).

b. Biomonitoring test results obtained during each monitoring period shall be summarized and reported using the appropriate Discharge Monitoring Report (DMR) form approved by the Department. In accordance with Section 2 of this part, an effluent toxicity report containing the information in Sections 2 and 6 shall be included with the DMR. Two copies of the test results must be submitted to the Department no later than 28 days after the month that tests were performed.

4. Additional Testing Requirements

a. If chronic toxicity is indicated (i.e., noncompliance with permit limit), then the Permittee must perform two additional valid chronic toxicity tests in accordance with these procedures to determine the extent and duration of the toxic condition. The toxicity tests shall run consecutively beginning on the first calendar week following the date that the Permittee became aware of the permit noncompliance. The results of these follow-up tests shall be submitted to the Department no later than 28 days following the month the tests were performed.

b. If the additional chronic toxicity tests are performed when PAA is being utilized, then the Permittee must analyze the effluent test solution each day immediately prior to test initiation or daily test renewal for hydrogen peroxide when the approriately diluted composite samples are added. **The concentrations of hydrogen peroxide shall be reported in the toxicity test report.**

c. After evaluation of the results of the follow-up tests, the Department will determine if additional action is appropriate and may require additional testing and/or toxicity reduction measures. The permittee may be required to perform a Toxicity Identification Evaluation (TIE) and/or a Toxicity Reduction Evaluation (TRE). The TIE/TRE shall be performed in accordance with the most recent protocols and guidance outlined by EPA (e.g., EPA/600/2-88/062, EPA/600/R-92/080, EPA/600/R-91-003, EPA/600/R-92/081, EPA/833/B-99/022, and/or EPA/600/6-91/005F)

5. Test Methods

The tests shall be performed in accordance with the latest edition of the "EPA Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The Larval Survival and Growth Test, Method 1000.0, shall be used for the fathead minnow (Pimephales promelas) test and the Survival and Reproduction Test, Method 1002.0, shall be used for the cladoceran (Ceriodaphnia dubia) test.

6. Effluent Toxicity Testing Reports

The following information shall be submitted with each DMR unless otherwise directed by the Department. The Department may at any times suspend or reinstate this requirement or may decrease or increase the frequency of submittals.

a. Introduction

(1) Facility name, location and county
(2) Permit number
(3) Toxicity testing requirements of permit
(4) Name of receiving water body
(5) Contract laboratory information (if tests are performed under contract)
  (a) Name of firm
  (b) Telephone number
  (c) Address
(6) Objective of test

b. Plant Operations

(1) Discharge Operating schedule (if other than continuous)
(2) Volume of discharge during sample collection to include Mean daily discharge on sample collection dates (MGD, CFS, GPM)
(3) Design flow of treatment facility at time of sampling

c. Source of Effluent and Dilution Water

(1) Effluent samples

  (a) Sampling point
  (b) Sample collection dates and times (to include composite sample start and finish times)
  (c) Sample collection method
  (d) Physical and chemical data of undiluted effluent samples (water temperature, pH, alkalinity, hardness, specific conductance, total residual chlorine (if applicable), etc.)
  (e) Lapsed time from sample collection to delivery
  (f) Lapsed time from sample collection to test initiation
  (g) Sample temperature when received at the laboratory

(2) Dilution Water

  (a) Source
  (b) Collection/preparation date(s) and time(s)
  (c) Pretreatment (if applicable)
  (d) Physical and chemical characteristics (water temperature, pH, alkalinity, hardness, specific conductance, etc.)

d. Test Conditions

(1) Toxicity test method utilized
(2) End point(s) of test
(3) Deviations from referenced method, if any, and reason(s)
(4) Date and time test started
(5) Date and time test terminated
(6) Type and volume of test chambers
(7) Volume of solution per chamber
(8) Number of organisms per test chamber
(9) Number of replicate test chambers per treatment
(10) Test temperature, pH, and dissolved oxygen as recommended by the method (to include ranges)
(11) Specify if aeration was needed
(12) Feeding frequency, amount, and type of food
(13) Specify if (and how) pH control measures were implemented
(14) Light intensity (mean)

e. Test Organisms

(1) Scientific name
(2) Life stage and age
(3) Source
(4) Disease(s) treatment (if applicable)

f. Quality Assurance

(1) Reference toxicant utilized and source
(2) Date and time of most recent chronic reference toxicant test(s), raw data, and current control chart(s). (The most recent chronic reference toxicant test shall be conducted within 30 days of the routine.)
(3) Dilution water utilized in reference toxicant test

(4) Results of reference toxicant test(s) (NOEC, IC25, etc.); report concentration-response relationship and evaluate test sensitivity
(5) Physical and chemical methods utilized

g. Results

(1) Provide raw toxicity data in tabular form, including daily records of affected organisms in each concentration (including controls) and replicate
(2) Provide table of endpoints: NOECs, IC25s, PASS/FAIL, etc. (as required in the applicable NPDES permit)
(3) Indicate statistical methods used to calculate endpoints
(4) Provide all physical and chemical data required by method
(5) Results of test(s) (NOEC, IC25, PASS/FAIL, etc.), report concentration-response relationship (definitive test only), report percent minimum significant difference (PMSD) calculated for sublethal endpoints determined by hypothesis testing.

h. Conclusions and Recommendations

(1) Relationship between test endpoints and permit limits
(2) Actions to be taken

1/ Adapted from "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", Fourth Edition, October 2002 (EPA 821-R-02-013), Section 10, Report Preparation.

C. TOTAL RESIDUAL CHLORINE (TRC) REQUIREMENTS

1. If chlorine is not utilized for disinfection purposes, TRC monitoring under Part I of this Permit is not required. If TRC monitoring is not required (conditional monitoring), "*9" or "NODI = 9" (if hard copy) should be reported on the DMR forms.

2. Testing for TRC shall be conducted according to either the amperometric titration method or the DPD colorimetric method as specified in Section 408(C) or (E), Standards Methods for the Examination of Water and Wastewater, 18th edition. If chlorine is not detected prior to actual discharge to the receiving stream using one of these methods (i.e., the analytical result is less than the detection level), the Permittee shall report on the DMR form "*B", "NODI = B" (if hard copy), or "0". The Permittee shall then be considered to be in compliance with the daily maximum concentration limit for TRC.

3. This permit contains a maximum allowable TRC level in the effluent. The Permittee is responsible for determining the minimum TRC level needed in the chlorine contact chamber to comply with E.coli limits. The effluent shall be dechlorinated if necessary to meet the maximum allowable effluent TRC level.

4. The sample collection point for effluent TRC shall be at a point downstream of the chlorine contact chamber (downstream of dechlorination if applicable). The exact location is to be approved by the Director.

D. PLANT CLASSIFICATION

The Permittee shall report to the Director within 30 days of the effective date of this permit, the name, address and operator number of the certified wastewater operator in responsible charge of the facility. Unless specified elsewhere in this permit, this facility shall be classified in accordance with ADEM Admin. Code R. 335-10-1-.03.

E. EFFLUENT ADMI COLOR LIMITATIONS AND REQUIREMENTS

1. The color of effluent shall be determined from samples collected five days per week at Outfall 0011. Color limitations are expressed as American Dye Manufacturers Institute (ADMI) units.

2. The discharge of treated wastewater effluent through Outfall 0011 shall not exceed a daily maximum value of 80 ADMI color units as determined by measuring color of the effluent. Compliance with this requirement shall be determined by sampling the effluent five days per week, using grab samples collected on the same day as samples collected pursuant to Part I., Page 5 at a location approved by the Department for the measurement of color in the effluent discharged through Outfall 001.

3. ADMI color shall be determined according to Section 2120 F., ADMI Tristimulus Filter Method, as described in Standards Methods for the Examination of Water and Wastewater, 17th Edition or the latest edition thereof.

F. PERACETIC ACID (PAA) REQUIREMENTS

1. The Permittee shall monitor PAA daily, but not required to exceed five days per week.

2. This permit contains a maximum allowable PAA level in the effluent. The Permittee is responsible for determining the minimum PAA level needed in the contact chamber to comply with E.coli limits.

3. The sample collection point for effluent PAA shall be at a point downstream of the contact chamber and shall be representative of the discharge.

4. Within 45 days of the effective date of this reissuance, the Permittee shall investigate and submit to the Department the PAA disinfection results in regards to neutralizing infectious agents, particularly viruses, as the discharge is to a waterbody that carries a Fish and Wildlfe classification for incidental water contact and whole body water-contact (ADEM Administrative Code, Rule 335-6-10-.09).

G. POLLUTANT SCANS

The Permittee shall sample and analyze for the pollutants listed in 40 CFR 122 Appendix J Table 2. The Permittee shall provide data from a minimum of three samples collected within the four and one half years prior to submitting a permit application. Samples must be representative of the seasonal variation in the discharge from each outfall.

H. STORM WATER REQUIREMENTS

1. Prohibitions

   a. The Permittee shall not allow the discharge of non-storm water into permitted storm water outfall(s) unless said discharge is already subject to an NPDES permit.

   b. Pollutants removed in the course of treatment or control shall be disposed in a manner that complies with all applicable Department rules and regulations.

2. Operational and Management Practices

   The permittee shall prepare and implement a Storm Water Pollution Prevention (SWPP) Plan within one year of the effective date of this permit.

   a. In the SWPP Plan, the Permittee shall:

      (1) Assess the treatment plant site by developing and presenting site drainage maps, materials inventory, and best management operational practices. The plan shall also include a description of all spill or leak sources;

      (2) Describe mechanisms and procedures to prevent the contact of sewage sludge, screenings, raw or partially treated wastewater, or any other waste product or pollutant with storm water discharged from the facility;

      (3) Provide for daily inspection on workdays of any structures that function to prevent storm water pollution or that remove pollutants from storm water;

      (4) Provide for daily inspection of the facility in general to ensure that the SWPP Plan is continually implemented and effective;

      (5) Include a Best Management Practices (BMP) Plan that, as a minimum, addresses housekeeping, preventative maintenance, spill prevention and response, and non-storm water discharges;

      (6) Describe mechanisms and procedures to provide sediment control sufficient to prevent or control storm water pollution storm water by particles resulting from soil or sediment migration from the site due to significant clearing, grading, or excavation activities;

      (7) Designate by position or name the person or persons responsible for the day to day implementation of the SWPP Plan; and

      (8) Bear the signature of an individual meeting signatory requirements as defined in ADEM Administrative Code, Rule 335-6-6-.09.

   b. The Director or his designee may notify the permittee at any time that the SWPP Plan is deficient and will require correction of the deficiency. The permittee shall correct any SWPP Plan deficiency identified by the Director or his designee within 30 days of receipt of notification and shall certify to the Department that the correction has been made and implemented.

   c. Administrative Procedures

      (1) A copy of the SWPP Plan shall be maintained at the facility and shall be available for inspection by the Department.

(2) A log of daily inspections required by Provision IV.H.2.a.(3.) of the permit shall be maintained at the facility and shall be made available for inspection by the Department upon request. The log shall contain records of all inspections performed and each daily entry shall be signed by the person performing the inspection.

(3) The Permittee shall provide training for any personnel required to implement the SWPP Plan and shall retain documentation of such training at the facility. Training records for all personnel shall be available for inspection by the Department. Training shall be performed prior to the date implementation is required.

3. Monitoring Requirements

a. Storm water discharged through each storm water outfall shall be sampled once per calendar year, using first flush grab samples (FFGS) collected during the first 30 minutes of discharge.

b. The total volume of storm water discharged for the event must be monitored, including the date and duration (in hours) and rainfall (in inches) for the storm event(s) sampled. The duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event must be a minimum of 72 hours. This information must be recorded as part of the sampling procedure and records retained in accordance with Provision I.B.5. of this permit. The volume may be measured using flow measurement devices or may be estimated using any method approved in writing by the Department.

I. SANITARY SEWER OVERFLOW RESPONSE PLAN

1. SSO Response Plan

Within 120 days of the effective date of this Permit, the Permittee shall develop a Sanitary Sewer Overflow (SSO) Response Plan to establish timely and effective methods for responding to notifiable sanitary sewer overflows. The SSO Response Plan shall address each of the following:

a. General Information:

(1) Approximate population of City/Town, if applicable

(2) Approximate number of customers served by the Permittee

(3) Identification of any subbasins designated by the Permittee, if applicable

(4) Identification of estimated linear feet of sanitary sewers

(5) Number of Pump/Lift Stations in the collection system

b. Responsibility Information:

(1) The title(s) and contact information of key position(s) who will coordinate the SSO response, including information for a backup coordinator in the event that the primary SSO coordinator is unavailable. The SSO coordinator is the person responsible for assessing the SSO and initiating a series of response actions based on the type, severity, and destination of the SSO, except for routine SSOs for which the coordinator may pre-approve written procedures. Routine SSOs are those for which the corrective action procedures are generally consistent.

(2) The title(s), and contact information of key position(s) who will respond to SSOs, including information for backup responder(s) in the event the primary responder(s) are unavailable (i.e., position(s) who provide notification to the Department, the public, the county health department, and other affected entities such as public water systems; position(s) responsible for organizing crews for response; position(s) responsible for addressing public inquiries)

c. SSO and Surface Water Assessment

(1) Identification of locations within the collection system at which an SSO is likely to occur (e.g., based upon historical SSOs, lift stations where electricity may be lost, etc.)

(2) A map of the general collection system area, including identification of surface waterbodies and the location(s) of public drinking water source(s). Mapping of all collection system piping, pump stations, etc. is not required; however, if this information is already available, it should be included.

(3) Identification of surface waterbodies within the collection system area which are classified as Swimming according to ADEM Admin. Code chap. 335-6-11. References available to assist in this requirement include: http://www.adem.state.al.us/alEnviroRegLaws/files/Division6Vol1.pdf and http://gis.adem.alabama.gov/ADEM_Dash/use_class/index.html

(4) Identification of surface waterbodies within the collection system area which are not classified as Swimming as indicated in paragraph c above, but are known locally as areas where swimming occurs or as areas that are heavily recreated

d. Public Reporting of SSOs

(1) Contact information for the public to report an SSO to the Permittee, during both normal and outside of normal business hours (e.g., telephone number, website, email address, etc.)

(2) Information requested from the person reporting an SSO to assist the Permittee in identifying the SSO (e.g., date, time, location, contact information)

(3) Procedures for communication of the SSO report to the appropriate positions for follow-up investigation and response, if necessary

e. Procedures to immediately notify the Department, the county health department, and other affected entities (such as public water systems) upon becoming aware of notifiable SSOs

f. Public Notification Methods for SSOs

(1) A listing of methods that are feasible, as determined by the Permittee, for public notifications (e.g., flyers distributed to nearby residents; signs posted at the location of the SSO, where the SSO enters a water of the state, and/or at a central public location; signs posted at fishing piers, boat launches, parks, swimming waterbodies, etc.; website and/or social media notifications; local print or radio and broadcast media notifications; "opt in" email, text message, or automated phone message notifications)

(a) If signage is a feasible method for public notification, procedures for use and removal of signage (e.g., availability and maintenance of signs, appropriate duration of postings)

(2) Minimum information to be included in public notifications (e.g., identification that an SSO has occurred, date, duration if known, estimated volume if known, location of the SSO by street address or other appropriate method, initial destination of the SSO)

(3) Procedures developed by the Permittee for determining the appropriate public notification method(s) based upon the potential for public exposure to health risks associated with the SSO

g. Standard Procedures shall be developed by the Permittee and shall include, at a minimum:

(1) General SSO Response Procedures (e.g., procedures for dispatching staff to assess/correct an SSO; procedures for routine SSO corrective actions such as those for sewer blockages, overflowing manholes, line breakages, pump station power failure, etc.; procedures for disinfection of affected area, if applicable);

(2) Procedures for collection and proper disposal of the SSO, if feasible.

(3) General procedures for coordinating instream water quality monitoring, including, but not limited to, procedures for mobilizing staff, collecting samples, and typical test methods should the Department or the Permittee determine monitoring is appropriate following an SSO. Identification of a contractor who will collect and analyze the sample(s) may be listed in lieu of the procedures.

(4) References to other documents (such as Standard Operating Procedures for SSO Responses) may be acceptable for this section; however, the referenced document shall be identified and shall be reviewed at a frequency of at least that required by the Administrative Procedures Section.

h. Date of the SSO Response Plan, dates of all modifications and/or reviews, the title and signature of the reviewer(s) for each date and the signature of the responsible official or the appropriate designee.

2. SSO Response Plan Implementation

Except as otherwise required by this Permit, the Permittee shall fully implement the SSO Response Plan as soon as practicable, but no later than 180 days after the effective date of this Permit.

3. Department Review of the SSO Response Plan

   a. When requested by the Director or his designee, the Permittee shall make the SSO Response Plan available for review by the Department.

   b. Upon review, the Director or his designee may notify the Permittee that the SSO Response Plan is deficient and require modification of the Plan.

   c. Within thirty days of receipt of notification, or an alternate timeframe as approved by the Department, the Permittee shall modify any SSO Response Plan deficiency identified by the Director or his designee and shall certify to the Department that the modification has been made.

4. SSO Response Plan Administrative Procedures

   a. The Permittee shall maintain a copy of the SSO Response Plan at the permitted facility or an alternate location approved by the Department in writing and shall make it available for inspection by the Department.

   b. The Permittee shall make a copy of the SSO Response Plan available to the public upon written request within 30 days of such request. The Permittee may redact information which may present security issues, such as location of public water supplies, identification of specific details of vulnerabilities, employee information, etc.

   c. The Permittee shall provide training for any personnel required to implement the SSO Response Plan and shall retain at the facility documentation of such training. This documentation shall be available for inspection by the Department. Training shall be provided for existing personnel prior to the date by which implementation of the SSO Response Plan is required and for new personnel as soon as possible. Should significant revisions be made to the SSO Response Plan, training regarding the revisions shall be conducted as soon as possible.

   d. The Permittee shall complete a review and evaluation of the SSO Response Plan at least once every three years. Documentation of the SSO Response Plan review and evaluation shall be signed and dated by the responsible official or the appropriate designee as part of the SSO Response Plan.

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

FACT SHEET

APPLICATION FOR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT TO DISCHARGE POLLUTANTS TO WATERS OF THE STATE OF ALABAMA

Date: April 17, 2019 **Prepared By:** Shanda Torbert

NPDES Permit No. AL0058408

1. **Name and Address of Applicant:**

   Water Works & Sewer Board of the City of Oxford
   Post Office Box 3663
   Oxford, AL 36203

2. **Name and Address of Facility:**

   Tull C. Allen WWTP
   2975 Silver Run Road
   Oxford, Alabama 36203

3. **Description of Applicant's Type of Facility and/or Activity Generating the Discharge:**

   Waste Water Treatment Plant

4. **Applicant's Receiving Waters**

Receiving Waters	Classifications
Choccolocco Creek	F&W

   For the Outfall latitude and longitude see the permit application.

5. **Permit Conditions:**

   See attached Rationale and Draft Permit.

6. **PROCEDURES FOR THE FORMULATION OF FINAL DETERMINATIONS**

   a. **Comment Period**

   The Alabama Department of Environmental Management proposes to issue this NPDES permit subject to the limitations and special conditions outlined above. This determination is tentative.

   Interested persons are invited to submit written comments on the draft permit to the following address:

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

Russell A. Kelly, Chief
Permits and Services Division
Alabama Department of Environmental Management
1400 Coliseum Blvd
(Mailing Address: Post Office Box 301463; Zip 36130-1463)
Montgomery, Alabama 36110-2059
(334) 271-7714

All comments received prior to the closure of the public notice period (see public notice for date) will be considered in the formulation of the final determination with regard to this permit.

b. Public Hearing

A written request for a public hearing may be filed within the public notice period and must state the nature of the issues proposed to be raised in the hearing. A request for a hearing should be filed with the Department at the following address:

Russell A. Kelly, Chief
Permits and Services Division
Alabama Department of Environmental Management
1400 Coliseum Blvd
(Mailing Address: Post Office Box 301463; Zip 36130-1463)
Montgomery, Alabama 36110-2059
(334) 271-7714

The Director shall hold a public hearing whenever it is found, on the basis of hearing requests, that there exists a significant degree of public interest in a permit application or draft permit. The Director may hold a public hearing whenever such a hearing might clarify one or more issues involved in the permit decision. Public notice of such a hearing will be made in accordance with ADEM Admin. Code r. 335-6-6-.21.

c. Issuance of the Permit

All comments received during the public comment period shall be considered in making the final permit decision. At the time that any final permit decision is issued, the Department shall prepare a response to comments in accordance with ADEM Admin. Code r. 335-6-6-.21. **The permit record, including the response to comments, will be available to the public via the eFile System** (http://app.adem.alabama.gov/eFile/) **or an appointment to review the record may be made by writing the Permits and Services Division at the above address.**

Unless a request for a stay of a permit or permit provision is granted by the Environmental Management Commission, the proposed permit contained in the Director's determination shall be issued and effective, and such issuance will be the final administrative action of the Alabama Department of Environmental Management.

d. Appeal Procedures

As allowed under ADEM Admin. Code chap. 335-2-1, any person aggrieved by the Department's final administrative action may file a request for hearing to contest such action. Such requests should be received by the Environmental Management Commission within thirty days of issuance of the permit. Requests should be filed with the Commission at the following address:

Alabama Environmental Management Commission
1400 Coliseum Blvd
(Mailing Address: Post Office Box 301463; Zip 36130-1463)
Montgomery, Alabama 36110-2059

All requests must be in writing and shall contain the information provided in ADEM Admin. Code r. 335-2-1-.04.

Facility Name: **Oxford Tull C. Allen WWTP**

NPDES No.: **AL0058408**

6/13/2017

$Q_d*C_d + Q_{d2}*C_{d2} + Q_s*C_s = Q_r*C_r$

ID	Pollutant	Carcinogen "yes"	Type	Background from upstream source (C_{d2}) Daily Max	Background from upstream source (C_{d2}) Monthly Ave	Background Instream (C_s) Daily Max	Background Instream (C_s) Monthly Ave	Enter Max Daily Discharge as reported by Applicant (C_d) Max	Enter Avg Daily Discharge as reported by Applicant (C_d) Ave	Partition Coefficient (Stream / Lake)
				ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
1	Antimony		Metals	0	0	0	0	76	34	-
2	**Arsenic*,****	YES	Metals	0	0	0	0	0	0	0.574
3	Beryllium		Metals	0	0	0	0	0	0	-
4	Cadmium**		Metals	0	0	0	0	0.012	0.000176	0.236
5	Chromium / Chromium III**		Metals	0	0	0	0	0	0	0.210
6	Chromium / Chromium VI**		Metals	0	0	0	0	0	0	
7	Copper**		Metals	0	0	0	0	0	0	0.388
8	Lead**		Metals	0	0	0	0	7	0.1	0.206
9	Mercury**		Metals	0	0	0	0	0.0056	0.002685	0.302
10	Nickel**		Metals	0	0	0	0	0	0	0.505
11	Selenium		Metals	0	0	0	0	0	0	-
12	Silver		Metals	0	0	0	0	2	0.5	-
13	Thallium		Metals	0	0	0	0	0	0	-
14	Zinc**		Metals	0	0	0	0	66	16.5	0.330
15	Cyanide		Metals	0	0	0	0	88	2.61	-
16	Total Phenolic Compounds		Metals	0	0	0	0	0	0	-
17	Hardness (As CaCO3)		Metals	0	0	67280	59200	161000	155000	-
18	Acrolein		VOC	0	0	0	0	0	0	-
19	**Acrylonitrile***	YES	VOC	0	0	0	0	0	0	-
20	**Aldrin**	YES	VOC	0	0	0	0	0	0	-
21	**Benzene***	YES	VOC	0	0	0	0	0	0	-
22	**Bromoform***	YES	VOC	0	0	0	0	0	0	-
23	**Carbon Tetrachloride***	YES	VOC	0	0	0	0	0	0	-
24	**Chlordane**	YES	VOC	0	0	0	0	0	0	-
25	Clorobenzene		VOC	0	0	0	0	0	0	-
26	**Chlorodibromo-Methane***	YES	VOC	0	0	0	0	0	0	-
27	Chloroethane		VOC	0	0	0	0	0	0	-
28	2-Chloro-Ethylvinyl Ether		VOC	0	0	0	0	0	0	-
29	**ChloroForm***	YES	VOC	0	0	0	0	55	16	-
30	**4,4'-DDD**	YES	VOC	0	0	0	0	0	0	-
31	**4,4'-DDE**	YES	VOC	0	0	0	0	0	0	-
32	**4,4'-DDT**	YES	VOC	0	0	0	0	0	0	-
33	**Dichlorobromo-Methane***	YES	VOC	0	0	0	0	11	3	-
34	1, 1-Dichloroethane		VOC	0	0	0	0	0	0	-
35	**1, 2-Dichloroethane***	YES	VOC	0	0	0	0	0	0	-
36	Trans-1, 2-Dichloro-Ethylene		VOC	0	0	0	0	0	0	-
37	**1, 1-Dichloroethylene***	YES	VOC	0	0	0	0	0	0	-
38	1, 2-Dichloropropane		VOC	0	0	0	0	0	0	-
39	1, 3-Dichloro-Propylene		VOC	0	0	0	0	0	0	-
40	**Dieldrin**	YES	VOC	0	0	0	0	0	0	-
41	Ethylbenzene		VOC	0	0	0	0	0	0	-
42	Methyl Bromide		VOC	0	0	0	0	0	0	-
43	Methyl Chloride		VOC	0	0	0	0	0	0	-
44	**Methylene Chloride***	YES	VOC	0	0	0	0	0	0	-
45	**1, 1, 2, 2-Tetrachloro-Ethane***	YES	VOC	0	0	0	0	0	0	-
46	**Tetrachloro-Ethylene***	YES	VOC	0	0	0	0	0	0	-
47	Toluene		VOC	0	0	0	0	0	0	-
48	**Toxaphene**	YES	VOC	0	0	0	0	0	0	-
49	**Tributyltine (TBT)**	YES	VOC	0	0	0	0	0	0	-
50	1, 1, 1-Trichloroethane		VOC	0	0	0	0	0	0	-
51	**1, 1, 2-Trichloroethane***	YES	VOC	0	0	0	0	0	0	-
52	**Trichloroethylene***	YES	VOC	0	0	0	0	0	0	-
53	**Vinyl Chloride***	YES	VOC	0	0	0	0	0	0	-
54	P-Chloro-M-Cresol		Acids	0	0	0	0	0	0	-
55	2-Chlorophenol		Acids	0	0	0	0	0	0	-
56	2, 4-Dichlorophenol		Acids	0	0	0	0	0	0	-
57	2, 4-Dimethylphenol		Acids	0	0	0	0	0	0	-
58	4, 6-Dinitro-O-Cresol		Acids	0	0	0	0	0	0	-
59	2, 4-Dinitrophenol		Acids	0	0	0	0	0	0	-
60	**4,6-Dintro-2-methylophenol**	YES	Acids	0	0	0	0	0	0	-
61	**Dioxin (2,3,7,8-TCDD)**	YES	Acids	0	0	0	0	0	0	-
62	2-Nitrophenol		Acids	0	0	0	0	0	0	-
63	4-Nitrophenol		Acids	0	0	0	0	0	0	-
64	**Pentachlorophenol***	YES	Acids	0	0	0	0	0	0	-
65	Phenol		Acids	0	0	0	0	0	0	-
66	**2, 4, 6-Trichlorophenol***	YES	Acids	0	0	0	0	0	0	-
67	Acenaphthene		Bases	0	0	0	0	0	0	-
68	Acenaphthylene		Bases	0	0	0	0	0	0	-
69	Anthracene		Bases	0	0	0	0	0	0	-
70	Benzidine		Bases	0	0	0	0	0	0	-
71	**Benzo(A)Anthracene***	YES	Bases	0	0	0	0	0	0	-
72	**Benzo(A)Pyrene***	YES	Bases	0	0	0	0	0	0	-
73	3, 4 Benzo-Fluoranthene		Bases	0	0	0	0	0	0	-
74	Benzo(GHI)Perylene		Bases	0	0	0	0	0	0	-
75	Benzo(K)Fluoranthene		Bases	0	0	0	0	0	0	-
76	Bis (2-Chloroethoxy) Methane		Bases	0	0	0	0	0	0	-
77	**Bis (2-Chloroethyl)-Ether***	YES	Bases	0	0	0	0	0	0	-
78	Bis (2-Chloroiso-Propyl) Ether		Bases	0	0	0	0	0	0	-
79	**Bis (2-Ethylhexyl) Phthalate***	YES	Bases	0	0	0	0	0	0	-
80	4-Bromophenyl Phenyl Ether		Bases	0	0	0	0	0	0	-
81	Butyl Benzyl Phthalate		Bases	0	0	0	0	0	0	-
82	2-Chloronaphthalene		Bases	0	0	0	0	0	0	-
83	4-Chlorophenyl Phenyl Ether		Bases	0	0	0	0	0	0	-
84	**Chrysene***	YES	Bases	0	0	0	0	0	0	-
85	Di-N-Butyl Phthalate		Bases	0	0	0	0	0	0	-
86	Di-N-Octyl Phthalate		Bases	0	0	0	0	0	0	-
87	**Dibenzo(A,H)Anthracene***	YES	Bases	0	0	0	0	0	0	-
88	1, 2-Dichlorobenzene		Bases	0	0	0	0	0	0	-
89	1, 3-Dichlorobenzene		Bases	0	0	0	0	0	0	-
90	1, 4-Dichlorobenzene		Bases	0	0	0	0	0	0	-
91	**3, 3-Dichlorobenzidine***	YES	Bases	0	0	0	0	0	0	-
92	Diethyl Phthalate		Bases	0	0	0	0	0	0	-
93	Dimethyl Phthalate		Bases	0	0	0	0	0	0	-
94	**2, 4-Dinitrotoluene***	YES	Bases	0	0	0	0	0	0	-
95	2, 6-Dinitrotoluene		Bases	0	0	0	0	0	0	-
96	1,2-Diphenylhydrazine		Bases	0	0	0	0	0	0	-
97	**Endosulfan (alpha)**	YES	Bases	0	0	0	0	0	0	-
98	**Endosulfan (beta)**	YES	Bases	0	0	0	0	0	0	-
99	**Endosulfan sulfate**	YES	Bases	0	0	0	0	0	0	-
100	**Endrin**	YES	Bases	0	0	0	0	0	0	-
101	**Endrin Aldeyhide**	YES	Bases	0	0	0	0	0	0	-
102	Fluoranthene		Bases	0	0	0	0	0	0	-
103	Fluorene		Bases	0	0	0	0	0	0	-
104	Heptochlor	YES	Bases	0	0	0	0	0	0	-
105	Heptachlor Epoxide	YES	Bases	0	0	0	0	0	0	-
106	**Hexachlorobenzene***	YES	Bases	0	0	0	0	0	0	-
107	**Hexachlorobutadiene***	YES	Bases	0	0	0	0	0	0	-
108	**Hexachlorocyclohexan (alpa)**	YES	Bases	0	0	0	0	0	0	-
109	**Hexachlorocyclohexan (beta)**	YES	Bases	0	0	0	0	0	0	-
110	**Hexachlorocyclohexan (gamma)**	YES	Bases	0	0	0	0	0	0	-
111	HexachlorocycloPentadiene		Bases	0	0	0	0	0	0	-
112	Hexachloroethane		Bases	0	0	0	0	0	0	-
113	**Indeno(1, 2, 3-CK)Pyrene***	YES	Bases	0	0	0	0	0	0	-
114	Isophorone		Bases	0	0	0	0	0	0	-
115	Naphthalene		Bases	0	0	0	0	0	0	-
116	Nitrobenzene		Bases	0	0	0	0	0	0	-
117	**N-Nitrosodi-N-Propylamine***	YES	Bases	0	0	0	0	0	0	-
118	**N-Nitrosodi-N-Methylamine***	YES	Bases	0	0	0	0	0	0	-
119	**N-Nitrosodi-N-Phenylamine***	YES	Bases	0	0	0	0	0	0	-
120	**PCB-1016**	YES	Bases	0	0	0	0	0	0	-
121	**PCB-1221**	YES	Bases	0	0	0	0	0	0	-
122	**PCB-1232**	YES	Bases	0	0	0	0	0	0	-
123	**PCB-1242**	YES	Bases	0	0	0	0	0	0	-
124	**PCB-1248**	YES	Bases	0	0	0	0	0	0	-
125	**PCB-1254**	YES	Bases	0	0	0	0	0	0	-
126	**PCB-1260**	YES	Bases	0	0	0	0	0	0	-
127	Phenanthrene		Bases	0	0	0	0	0	0	-
128	Pyrene		Bases	0	0	0	0	0	0	-
129	1, 2, 4-Trichlorobenzene		Bases	0	0	0	0	0	0	-

4.5	Enter Q_d = wastewater discharge flow from facility (MGD)
6.9625305	Q_d = wastewater discharge flow (cfs) (this value is calculated from the MGD)
0	Enter flow from upstream discharge Qd2 = background stream flow in MGD above point of discharge
0	Qd2 = background stream flow from upstream source (cfs)
35.09	Enter 7Q10, Q_s = background stream flow in cfs above point of discharge
15.36	Enter or estimated, 1Q10, Q_s = background stream flow in cfs above point of discharge (1Q10 estimated at 75% of 7Q10)
358.53	Enter Mean Annual Flow, Q_s = background stream flow in cfs above point of discharge
42.18	Enter 7Q2, Q_s = background stream flow in cfs above point of discharge (For LWF class streams)
Enter to Left	Enter C_s = background in-stream pollutant concentration in µg/l (assuming this is zero "0" unless there is data)
$Q_d + Qd2 = Q_r$	Q_r = resultant in-stream flow, after discharge
Calculated on other	C_r = resultant in-stream pollutant concentration in µg/l in the stream (after complete mixing occurs)
69.2	Enter, Background Hardness above point of discharge (assumed 50 South of Birmingham and 100 North of Birmingham)
7.00 s.u.	Enter, Background pH above point of discharge
YES	Enter, Is discharge to a stream? "YES" Other option would be to a Lake. (This changes the partition coefficients for the metals)

** Using Partition Coefficients

June 13, 2019

Facility Name: Oxford Tull C. Allen WWTP

NPDES No.: AL0058408

					Freshwater F&W classification				Freshwater Acute (µg/l) Q_s =1Q10					Freshwater Chronic (µg/l) Q_s = 7Q10					Human Health Consumption Fish only (µg/l) Carcinogen Q_s = Annual Average Non-Carcinogen Q_s = 7Q10			
ID	Pollutant	RP?	Carcinogen yes	Background from upstream source (Cd2) Daily Max	Max Daily Discharge as reported by Applicant (C_{max})	Water Quality Criteria (C_s)	Draft Permit Limit (C_{max})	20% of Draft Permit Limit	RP?	Background from upstream source (Cd2) Monthly Ave	Avg Daily Discharge as reported by Applicant (C_{ave})	Water Quality Criteria (C_s)	Draft Permit Limit (C_{max})	20% of Draft Permit Limit	RP?	Water Quality Criteria (C_s)	Draft Permit Limit (C_{max})	20% of Draft Permit Limit	RP?
1	Antimony			0	76	-	-	-	-	0	34	-	-	-	-	3.73E+02	2.25E+03	4.51E+02	No
2	Arsenic		YES	0	0	592.334	1899.060	379.818	No	0	0	261.324	1576.354	315.671	No	3.03E-01	1.59E+01	3.18E+00	No
3	Beryllium			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
4	Cadmium			0	0.012	5.964	19.123	3.825	No	0	0.000178	0.807	4.874	0.975	No	-	-	-	-
5	Chromium/ Chromium III			0	0	2006.894	6434.259	1286.852	No	0	0	261.054	1578.725	315.345	No	-	-	-	-
6	Chromium/ Chromium VI			0	0	16.005	51.298	10.260	No	0	0	11.000	66.436	13.288	No	-	-	-	-
7	Copper			0	0	24.464	78.499	15.700	No	0	0	16.852	101.781	20.356	No	-	-	-	-
8	Lead			0	7	209.505	671.692	134.338	No	0	0.1	8.164	49.310	9.862	No	-	-	-	-
9	Mercury			0	0.0056	1.460	7.695	1.539	No	0	0.002685	0.012	0.072	0.014	No	4.24E-02	2.56E-01	5.12E-02	No
10	Nickel			0	0	679.062	2177.105	435.421	No	0	0	75.422	455.535	91.107	No	9.93E+02	6.00E+03	1.20E+03	No
11	Selenium			0	0	20.000	64.122	12.824	No	0	0	5.000	30.199	6.040	No	2.43E+03	1.47E+04	2.94E+03	No
12	Silver	YES		0	2	1.708	8.476	1.695	Yes	0	0.5	-	-	-	-	-	-	-	-
13	Thallium			0	0	-	-	-	-	0	0	-	-	-	-	2.74E-01	1.65E+00	3.30E-01	No
14	Zinc			0	66	259.534	833.373	166.675	No	0	16.5	262.080	1582.801	316.560	No	1.49E+04	9.00E+04	1.80E+04	No
15	Cyanide	YES		0	88	22.000	70.534	14.107	Yes	0	2.81	5.200	31.407	6.281	No	9.33E+03	5.64E+04	1.13E+04	No
16	Total Phenolic Compounds			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
17	Hardness (As CaCO3)			0	161000	-	-	-	-	0	155000	-	-	-	-	-	-	-	-
18	Acrolein			0	0	-	-	-	-	0	0	-	-	-	-	5.43E+00	3.28E+01	6.55E+00	No
19	Acrylonitrile		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.44E-01	7.56E+00	1.51E+00	No
20	Aldrin		YES	0	0	3.000	9.618	1.924	No	0	0	-	-	-	-	7.94E-05	1.54E-03	3.09E-04	No
21	Benzene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.65E+01	8.12E+02	1.62E+02	No
22	Bromoform		YES	0	0	-	-	-	-	0	0	-	-	-	-	7.38E+01	4.13E+03	8.27E+02	No
23	Carbon Tetrachloride		YES	0	0	-	-	-	-	0	0	-	-	-	-	9.67E-01	5.03E+01	1.01E+01	No
24	Chlordane		YES	0	0	2.400	7.695	1.539	No	0	0	0.0043	0.026	0.005	No	4.73E-04	2.48E-02	4.96E-03	No
25	Clorobenzene			0	0	-	-	-	-	0	0	-	-	-	-	9.09E+02	5.47E+03	1.09E+03	No
26	Chlorodibromo-Methane		YES	0	0	-	-	-	-	0	0	-	-	-	-	7.41E+00	3.89E+02	7.78E+01	No
27	Chloroethane			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
28	2-Chloro-Ethylvinyl Ether			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
29	ChloroForm		YES	0	55	-	-	-	-	0	16	-	-	-	-	1.02E+02	5.35E+03	1.07E+03	No
30	4,4' - DDD		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.81E-04	9.52E-03	1.90E-03	No
31	4,4' - DDE		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.29E-04	6.72E-03	1.34E-03	No
32	4,4' - DDT		YES	0	0	1.100	3.527	0.705	No	0	0	0.001	0.006	0.001	No	1.29E-04	6.72E-03	1.34E-03	No
33	Dichlorobromo-Methane		YES	0	11	-	-	-	-	0	3	-	-	-	-	1.00E+01	5.27E+02	1.05E+02	No
34	1, 1-Dichloroethane			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
35	1, 2-Dichloroethane		YES	0	0	-	-	-	-	0	0	-	-	-	-	2.14E+01	1.12E+03	2.24E+02	No
36	Trans-1, 2-Dichloro-Ethylene			0	0	-	-	-	-	0	0	-	-	-	-	3.81E+03	3.57E+04	7.14E+03	No
37	1, 1-Dichloroethylene		YES	0	0	-	-	-	-	0	0	-	-	-	-	4.17E+03	2.19E+05	4.37E+04	No
38	1, 2-Dichloropropane			0	0	-	-	-	-	0	0	-	-	-	-	8.49E+00	5.13E+01	1.03E+01	No
39	1, 3-Dichloro-Propylene			0	0	-	-	-	-	0	0	-	-	-	-	1.23E+01	7.42E+01	1.48E+01	No
40	Dieldrin		YES	0	0	0.240	0.769	0.154	No	0	0	0.056	0.338	0.068	No	3.12E-05	1.64E-03	3.28E-04	No
41	Ethylbenzene			0	0	-	-	-	-	0	0	-	-	-	-	1.24E+03	7.52E+03	1.50E+03	No
42	Methyl Bromide			0	0	-	-	-	-	0	0	-	-	-	-	8.71E+02	5.26E+03	1.05E+03	No
43	Methyl Chloride			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
44	Methylene Chloride		YES	0	0	-	-	-	-	0	0	-	-	-	-	3.46E+02	1.81E+04	3.63E+03	No
45	1, 1, 2, 2-Tetrachloro-Ethane		YES	0	0	-	-	-	-	0	0	-	-	-	-	3.30E+00	1.22E+02	2.45E+01	No
46	Tetrachloro-Ethylene		YES	0	0	-	-	-	-	0	0	-	-	-	-	3.82E+00	1.01E+02	2.01E+01	No
47	Toluene			0	0	-	-	-	-	0	0	-	-	-	-	8.72E+03	5.27E+04	1.05E+04	No
48	Toxaphene		YES	0	0	0.730	2.340	0.468	No	0	0	0.0002	0.001	0.000	No	1.63E-04	8.50E-03	1.70E-03	No
49	Tributyltin (TBT)		YES	0	0	0.460	1.475	0.295	No	0	0	0.072	0.435	0.087	No	-	-	-	-
50	1, 1, 1-Trichloroethane			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
51	1, 1, 2-Trichloroethane		YES	0	0	-	-	-	-	0	0	-	-	-	-	5.30E+00	4.78E+02	9.55E+01	No
52	Trichloroethylene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.75E+01	9.17E+02	1.83E+02	No
53	Vinyl Chloride		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.42E+00	7.48E+01	1.50E+01	No
54	P-Chloro-M-Cresol			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
55	2-Chlorophenol			0	0	-	-	-	-	0	0	-	-	-	-	8.71E+01	5.26E+02	1.05E+02	No
56	2, 4-Dichlorophenol			0	0	-	-	-	-	0	0	-	-	-	-	1.72E+02	1.04E+03	2.08E+02	No
57	2, 4-Dimethylphenol			0	0	-	-	-	-	0	0	-	-	-	-	4.99E+02	3.00E+03	6.01E+02	No
58	4, 6-Dinitro-O-Cresol			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
59	2, 4-Dinitrophenol			0	0	-	-	-	-	0	0	-	-	-	-	3.11E+03	1.88E+04	3.76E+03	No
60	4,6-Dinitro-2-methylphenol		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.65E+02	8.69E+03	1.74E+03	No
61	Dioxin (2,3,7,8-TCDD)		YES	0	0	-	-	-	-	0	0	-	-	-	-	2.67E-08	1.40E-06	2.80E-07	No
62	2-Nitrophenol			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
63	4-Nitrophenol			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
64	Pentachlorophenol		YES	0	0	8.723	27.988	5.594	No	0	0	6.693	40.422	8.084	No	1.77E+00	9.28E+01	1.86E+01	No
65	Phenol			0	0	-	-	-	-	0	0	-	-	-	-	3.03E+05	3.02E+06	6.04E+05	No
66	2, 4, 6-Trichlorophenol		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.41E+00	7.42E+01	1.48E+01	No
67	Acenaphthene			0	0	-	-	-	-	0	0	-	-	-	-	6.79E+02	3.49E+03	6.98E+02	No
68	Acenaphthylene			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
69	Anthracene			0	0	-	-	-	-	0	0	-	-	-	-	2.33E+04	1.41E+05	2.82E+04	No
70	Benzidine			0	0	-	-	-	-	0	0	-	-	-	-	1.15E-04	7.00E-04	1.40E-04	No
71	Benzo(A)Anthracene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	5.59E-01	1.12E-01	No
72	Benzo(A)Pyrene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	5.59E-01	1.12E-01	No
73	Benzo(b)fluoranthene			0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	6.44E-02	1.29E-02	No
74	Benzo(GHI)Perylene			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
75	Benzo(K)Fluoranthene			0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	6.44E-02	1.29E-02	No
76	Bis (2-Chloroethoxy) Methane			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
77	Bis (2-Chloroethyl)-Ether		YES	0	0	-	-	-	-	0	0	-	-	-	-	3.07E-01	1.61E+01	3.23E+00	No
78	Bis (2-Chloroiso-Propyl) Ether			0	0	-	-	-	-	0	0	-	-	-	-	5.79E+04	2.28E+05	4.56E+04	No
79	Bis (2-Ethylhexyl) Phthalate		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.28E+00	6.73E+01	1.35E+01	No
80	4-Bromophenyl Phenyl Ether			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
81	Butyl Benzyl Phthalate			0	0	-	-	-	-	0	0	-	-	-	-	1.13E+03	6.81E+03	1.36E+03	No
82	2-Chloronaphthalene			0	0	-	-	-	-	0	0	-	-	-	-	9.24E+02	5.56E+03	1.12E+03	No
83	4-Chlorophenyl Phenyl Ether			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
84	Chrysene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	5.59E-01	1.12E-01	No
85	Di-N-Butyl Phthalate			0	0	-	-	-	-	0	0	-	-	-	-	2.62E+03	1.56E+04	3.17E+03	No
86	Di-N-Octyl Phthalate			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
87	Dibenzo(A,H)Anthracene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.07E-03	5.59E-01	1.12E-01	No
88	1, 2-Dichlorobenzene			0	0	-	-	-	-	0	0	-	-	-	-	7.55E+02	4.56E+03	9.12E+02	No
89	1, 3-Dichlorobenzene			0	0	-	-	-	-	0	0	-	-	-	-	5.62E+02	3.40E+03	6.79E+02	No
90	1, 4-Dichlorobenzene			0	0	-	-	-	-	0	0	-	-	-	-	1.12E+02	6.79E+02	1.36E+02	No
91	3, 3-Dichlorobenzidine		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.89E-02	8.72E-01	1.74E-01	No
92	Diethyl Phthalate			0	0	-	-	-	-	0	0	-	-	-	-	2.56E+04	1.54E+05	3.09E+04	No
93	Dimethyl Phthalate			0	0	-	-	-	-	0	0	-	-	-	-	6.49E+05	3.91E+06	7.83E+05	No
94	2, 4-Dinitrotoluene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.86E+00	1.04E+02	2.08E+01	No
95	2, 6-Dinitrotoluene			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
96	1,2-Diphenylhydrazine			0	0	-	-	-	-	0	0	-	-	-	-	1.13E-01	7.07E-01	1.41E-01	No
97	Endosulfan (alpha)		YES	0	0	0.22	0.705	0.141	No	0	0	0.056	0.338	0.068	No	5.19E+01	2.72E+03	5.44E+02	No
98	Endosulfan (beta)		YES	0	0	0.22	0.705	0.141	No	0	0	0.056	0.338	0.068	No	5.19E+01	2.72E+03	5.44E+02	No
99	Endosulfan sulfate		YES	0	0	-	-	-	-	0	0	-	-	-	-	5.19E+01	2.72E+03	5.44E+02	No
100	Endrin		YES	0	0	0.086	0.278	0.055	No	0	0	0.036	0.217	0.043	No	3.87E-02	1.85E+00	3.70E-01	No
101	Endrin Aldeyhde		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.76E+01	9.26E+00	1.85E+00	No
102	Fluoranthene			0	0	-	-	-	-	0	0	-	-	-	-	3.12E+01	4.90E+02	9.80E+01	No
103	Fluorene			0	0	-	-	-	-	0	0	-	-	-	-	3.11E+03	1.88E+04	3.76E+03	No
104	Heptachlor		YES	0	0	0.52	1.667	0.333	No	0	0	0.0038	0.023	0.005	No	1.83E-05	2.43E-03	4.86E-04	No
105	Heptachlor Epoxide		YES	0	0	0.52	1.667	0.333	No	0	0	0.0038	0.023	0.005	No	2.29E-05	1.20E-03	2.40E-04	No
106	Hexachlorobenzene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.78E-04	8.81E-03	1.76E-03	No
107	Hexachlorobutadiene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.06E+01	5.65E+02	1.13E+02	No
108	Hexachlorocyclohexan (alpha)		YES	0	0	-	-	-	-	0	0	-	-	-	-	2.80E-03	1.50E-01	2.99E-02	No
109	Hexachlorocyclohexan (beta)		YES	0	0	-	-	-	-	0	0	-	-	-	-	9.97E-03	5.23E-01	1.05E-01	No
110	Hexachlorocyclohexan (gamma)		YES	0	0	0.95	3.046	0.609	No	0	0	-	-	-	-	1.06E+00	5.65E+01	1.13E+01	No
111	HexachlorocycloPentadiene			0	0	-	-	-	-	0	0	-	-	-	-	6.45E+02	3.90E+03	7.79E+02	No
112	Hexachloroethane			0	0	-	-	-	-	0	0	-	-	-	-	1.92E+00	1.16E+01	2.32E+00	No
113	Indeno(1, 2, 3-CK)Pyrene		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.07E-02	5.59E-01	1.12E-01	No
114	Isophorone			0	0	-	-	-	-	0	0	-	-	-	-	5.61E+02	3.39E+03	6.77E+02	No
115	Naphthalene			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
116	Nitrobenzene			0	0	-	-	-	-	0	0	-	-	-	-	4.09E+02	2.44E+03	4.88E+02	No
117	N-Nitrosodi-N-Propylamine		YES	0	0	-	-	-	-	0	0	-	-	-	-	2.09E-01	1.55E+01	3.10E+00	No
118	N-Nitrosodimethylamine		YES	0	0	-	-	-	-	0	0	-	-	-	-	1.79E+00	9.24E+01	1.85E+01	No
119	N-Nitrosodiphenylamine		YES	0	0	-	-	-	-	0	0	-	-	-	-	3.00E+00	1.84E+02	3.68E+01	No
120	PCB-1016		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
121	PCB-1221		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
122	PCB-1232		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
123	PCB-1242		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
124	PCB-1248		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
125	PCB-1254		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
126	PCB-1260		YES	0	0	-	-	-	-	0	0	0.014	0.085	0.017	No	1.74E-05	1.96E-03	3.93E-04	No
127	Phenanthrene			0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-
128	Pyrene			0	0	-	-	-	-	0	0	-	-	-	-	2.33E+03	1.41E+04	2.82E+03	No
129	1, 2, 4-Trichlorobenzene			0	0	-	-	-	-	0	0	-	-	-	-	4.09E+01	2.47E+02	4.94E+01	No

Permit Number: AL0058408
Monitoring Points: 0011
Stage: Effluent Gross Value
Parameter Name: Total Recoverable Cadmium
Parameter Code: 01113

Monitoring Period	Outfall	Monthly Average	Daily Maximium	Conc. Unit
September 2013	0011	0	0	µg/L
October 2013	0011	0	0	µg/L
November 2013	0011	0	0	µg/L
December 2013	0011	0.012	0.012	µg/L
January 2014	0011	0	0	µg/L
February 2014	0011	0	0	µg/L
March 2014	0011	0	0	µg/L
April 2014	0011	0	0	µg/L
May 2014	0011	0	0	µg/L
June 2014	0011	0	0	µg/L
July 2014	0011	0	0	µg/L
August 2014	0011	0	0	µg/L
September 2014	0011	0	0	µg/L
October 2014	0011	0	0	µg/L
November 2014	0011	0	0	µg/L
December 2014	0011	0	0	µg/L
January 2015	0011	0	0	µg/L
February 2015	0011	0	0	µg/L
March 2015	0011	0	0	µg/L
April 2015	0011	0	0	µg/L
May 2015	0011	0	0	µg/L
June 2015	0011	0	0	µg/L
July 2015	0011	0	0	µg/L
August 2015	0011	0	0	µg/L
September 2015	0011	0	0	µg/L
October 2015	0011	0	0	µg/L
November 2015	0011	0	0	µg/L
December 2015	0011	0	0	µg/L
January 2016	0011	0	0	µg/L
February 2016	0011	0	0	µg/L
March 2016	0011	0	0	µg/L
April 2016	0011	0	0	µg/L
May 2016	0011	0	0	µg/L
June 2016	0011	0	0	µg/L
July 2016	0011	0	0	µg/L
August 2016	0011	0	0	µg/L
September 2016	0011	0	0	µg/L
October 2016	0011	0	0	µg/L
November 2016	0011	0	0	µg/L
December 2016	0011	0	0	µg/L
January 2017	0011	0	0	µg/L
February 2017	0011	0	0	µg/L
March 2017	0011	0	0	µg/L
April 2017	0011	0	0	µg/L
May 2017	0011	0	0	µg/L
June 2017	0011	0	0	µg/L
July 2017	0011	0	0	µg/L
August 2017	0011	0	0	µg/L
September 2017	0011	0	0	µg/L
October 2017	0011	0	0	µg/L
November 2017	0011	0	0	µg/L
December 2017	0011	0	0	µg/L

January 2018	0011	0	0	µg/L
February 2018	0011	0	0	µg/L
March 2018	0011	0	0	µg/L
April 2018	0011	0	0	µg/L
May 2018	0011	0	0	µg/L
June 2018	0011	0	0	µg/L
July 2018	0011	0	0	µg/L
August 2018	0011	0	0	µg/L
September 2018	0011	0	0	µg/L
October 2018	0011	0	0	µg/L
November 2018	0011	0	0	µg/L
December 2018	0011	0	0	µg/L
January 2019	0011	0	0	µg/L
February 2019	0011	0	0	µg/L
March 2019	0011	0	0	µg/L
April 2019	0011	0	0	µg/L

Average		0.000176		µg/L
Maximum			0.012	µg/L

Permit Number: AL0058408
Monitoring Points: 0011
Stage: Effluent Gross Value
Parameter Name: Total Recoverable Lead
Parameter Code: 01114

Monitoring Period	Outfall	Monthly Average	Daily Maximium	Conc. Unit
September 2013	0011	0	0	µg/L
October 2013	0011	0.000	0.000	µg/L
November 2013	0011	0	0	µg/L
December 2013	0011	0	0	µg/L
January 2014	0011	0	0	µg/L
February 2014	0011	0	0	µg/L
March 2014	0011	0	0	µg/L
April 2014	0011	0	0	µg/L
May 2014	0011	0	0	µg/L
June 2014	0011	0	0	µg/L
July 2014	0011	0	0	µg/L
August 2014	0011	0.000	0.000	µg/L
September 2014	0011	0	0	µg/L
October 2014	0011	0	0	µg/L
November 2014	0011	0	0	µg/L
December 2014	0011	0	0	µg/L
January 2015	0011	0	0	µg/L
February 2015	0011	0	0	µg/L
March 2015	0011	0	0	µg/L
April 2015	0011	0	0	µg/L
May 2015	0011	0	0	µg/L
June 2015	0011	0.000	0.000	µg/L
July 2015	0011	7	7	µg/L
August 2015	0011	0	0	µg/L
September 2015	0011	0	0	µg/L
October 2015	0011	0	0	µg/L
November 2015	0011	0	0	µg/L
December 2015	0011	0	0	µg/L
January 2016	0011	0	0	µg/L
February 2016	0011	0	0	µg/L
March 2016	0011	0	0	µg/L
April 2016	0011	0	0	µg/L
May 2016	0011	0	0	µg/L
June 2016	0011	0	0	µg/L
July 2016	0011	0	0	µg/L
August 2016	0011	0	0	µg/L
September 2016	0011	0	0	µg/L
October 2016	0011	0	0	µg/L
November 2016	0011	0	0	µg/L
December 2016	0011	0	0	µg/L
January 2017	0011	0	0	µg/L
February 2017	0011	0	0	µg/L
March 2017	0011	0	0	µg/L
April 2017	0011	0	0	µg/L
May 2017	0011	0	0	µg/L
June 2017	0011	0	0	µg/L
July 2017	0011	0	0	µg/L
August 2017	0011	0	0	µg/L
September 2017	0011	0	0	µg/L
October 2017	0011	0	0	µg/L
November 2017	0011	0	0	µg/L
December 2017	0011	0	0	µg/L

January 2018	0011	0	0	µg/L
February 2018	0011	0	0	µg/L
March 2018	0011	0	0	µg/L
April 2018	0011	0	0	µg/L
May 2018	0011	0	0	µg/L
June 2018	0011	0	0	µg/L
July 2018	0011	0	0	µg/L
August 2018	0011	0	0	µg/L
September 2018	0011	0	0	µg/L
October 2018	0011	0	0	µg/L
November 2018	0011	0	0	µg/L
December 2018	0011	0	0	µg/L
January 2019	0011	0	0	µg/L
February 2019	0011	0	0	µg/L
March 2019	0011	0	0	µg/L
April 2019	0011	0	0	µg/L

Average		0.10		µg/L
Maximum			7	µg/L

Permit Number: AL0058408
Monitoring Points: 0011
Stage: Effluent Gross Value
Parameter Name: Total Recoverable Cyanide
Parameter Code: 78248

Monitoring Period	Outfall	Monthly Average	Daily Maximium	Conc. Unit
September 2013	0011	0	0	µg/L
October 2013	0011	0.000	0.000	µg/L
November 2013	0011	24	24	µg/L
December 2013	0011	0	0	µg/L
January 2014	0011	0	0	µg/L
February 2014	0011	0	0	µg/L
March 2014	0011	12	12	µg/L
April 2014	0011	0	0	µg/L
May 2014	0011	0	0	µg/L
June 2014	0011	0	0	µg/L
July 2014	0011	0	0	µg/L
August 2014	0011	0	0	µg/L
September 2014	0011	0	0	µg/L
October 2014	0011	0	0	µg/L
November 2014	0011	25	25	µg/L
December 2014	0011	24	24	µg/L
January 2015	0011	0.00	0.00	µg/L
February 2015	0011	1.6	14	µg/L
March 2015	0011	0	0	µg/L
April 2015	0011	0.00	0.00	µg/L
May 2015	0011	0.00	0.00	µg/L
June 2015	0011	0.00	0.00	µg/L
July 2015	0011	0.00	0.00	µg/L
August 2015	0011	0.00	0.00	µg/L
September 2015	0011	0.00	0.00	µg/L
October 2015	0011	0.00	0.00	µg/L
November 2015	0011	0.00	0.00	µg/L
December 2015	0011	0.00	0.00	µg/L
January 2016	0011	0.00	0.00	µg/L
February 2016	0011	0.00	0.00	µg/L
March 2016	0011	0.00	0.00	µg/L
April 2016	0011	0.00	0.00	µg/L
May 2016	0011	0.00	0.00	µg/L
June 2016	0011	0.00	0.00	µg/L
July 2016	0011	0.00	0.00	µg/L
August 2016	0011	0.00	0.00	µg/L
September 2016	0011	0.00	0.00	µg/L
October 2016	0011	0.00	0.00	µg/L
November 2016	0011	0.00	0.00	µg/L
December 2016	0011	0.00	0.00	µg/L
January 2017	0011	0.00	0.00	µg/L
February 2017	0011	0.00	0.00	µg/L
March 2017	0011	0.00	0.00	µg/L
April 2017	0011	*D	*D	µg/L
May 2017	0011	0.0	0.0	µg/L
June 2017	0011	0	0	µg/L
July 2017	0011	0	0	µg/L
August 2017	0011	0	0	µg/L
September 2017	0011	0	0	µg/L
October 2017	0011	0	0	µg/L
November 2017	0011	0	0	µg/L

December 2017	0011	0	0	µg/L
January 2018	0011	0	0	µg/L
February 2018	0011	0	0	µg/L
March 2018	0011	0	0	µg/L
April 2018	0011	0	0	µg/L
May 2018	0011	0	0	µg/L
June 2018	0011	0	0	µg/L
July 2018	0011	0	0	µg/L
August 2018	0011	0	0	µg/L
September 2018	0011	0	0	µg/L
October 2018	0011	0	0	µg/L
November 2018	0011	0	0	µg/L
December 2018	0011	0	0	µg/L
January 2019	0011	0	0	µg/L
February 2019	0011	0	0	µg/L
March 2019	0011	0	0	µg/L
April 2019	0011	88	88	µg/L

Average		2.61		µg/L
Maximum			88	µg/L

*D = Lost Sample/Data Not Available

	Units	2/17/2014	7/13/2015	9/26/2016	2/13/2017	Max	Avg
Analyses							
Silver, TREC, by GFAA							
Silver, as Ag	mg/L	0.002	0	0	0	0.002	0.0005
Total Hardness							
Hardness, Calcium/Magnesium (as CaCO3)	mg/L	144	160	161	153	161	155
ICP Metals, Total Recoverable							
Zinc, as Zn	mg/L	0	0.066	0	0	0.066	0.0165
Antimony, TREC for NPDES							
Antimony, as Sb	mg/L	0.02	0.076	0.026	0.013	0.076	0.03375
Volatiles by GC/MS Method 624							
Bromodichloromethane	mg/L	0	0	0.011	0	0.011	0.00275
Chloroform	mg/L	0	0	0.055	0.007	0.055	0.0155
Mercury Low Level (Hg-Composite)							
Mercury, Low Level as Hg	ng/L	5.6	1.4	1.9	1.84	5.6	2.685

NPDES PERMIT RATIONALE

NPDES Permit No: **AL0058408** Date: April 18, 2019

Permit Applicant: Water Works & Sewer Board of the City of Oxford
Post Office Box 3663
Oxford, Alabama 36203

Location: Oxford Tull C. Allen WWTP
2975 Silver Run Road
Oxford, Alabama 36203
Talladega County

Draft Permit is: Initial Issuance:
Reissuance due to expiration: **X**
Modification of existing permit:
Revocation and Reissuance:

Basis for Limitations: Water Quality Model: $CBOD_5$, NH_3N, and DO
Reissuance with no modification: $CBOD_5$, NH_3N, DO, pH, TSS, and Percent Removals
Instream calculation at 7Q10: IWC ≈ 27%
Toxicity based: TRC
Secondary Treatment Levels: TSS and Percent Removals
Other (described below): E. coli, PAA, Turbidity, Color, pH, and Cyanide

Design Flow in Million Gallons per Day: 4.5 MGD

Major: Yes

Description of Discharge: Outfall Number 0011; Effluent discharge to Choccolocco Creek, which is classified as Fish and Wildlife (F&W).

Outfall Numbers 002S and 003S;
Stormwater runoff to Choccolocco Creek, which is classified as Fish and Wildlife (F&W).

Discussion: This permit is a reissuance due to expiration. The permit limits for Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Ammonia as Nitrogen (NH_3N), and Dissolved Oxygen (DO) are based on a February 21, 2019 memorandum from the Department's Water Quality Branch indicating that the permit be reissued with the existing limits for DO, $CBOD_5$, and NH_3N until a new model is developed. Water Quality is working on an updated model that includes the facility's discharge with data from an intensive survey conducted on Choccolocco Creek during the summer of 2018.

The summer (May through November) and winter (December through April) monthly average limits for $CBOD_5$ are 8.0 mg/L and 25.0 mg/L, respectively; while, the summer and winter monthly average limits for NH_3N are 1.0 mg/L and 20.0 mg/L, respectively. Dissolved Oxygen has a yearly minimum limit of 6.0 mg/L

The pH limits were developed in accordance with the Water-Use designation of the receiving stream and the Municipal Section's Permit Development Guidance. The daily minimum and daily maximum limits are 6.0 s.u. and 9.0 s.u., respectively.

The monthly average Total Suspended Solids (TSS) limit is established at 30.0 mg/L in accordance with ADEM's Permit Development Rationale and 40 CFR 133.102. Minimum percent removal limits of 85 percent are imposed for both $CBOD_5$ and TSS in accordance with 40 CFR 133.102.

The receiving stream is Choccolocco Creek and it is a Tier I waterbody. The stream is on the current 303(d) list for impaired waterbodies for Pathogens, Mercury, and PCBs. The current permit limits for E. coli are considered protective of the stream and should not contribute to the impairments. This permit will require annual monitoring for Total Recoverable Mercury since the Mercury data submitted by the Permittee includes Mercury concentrations below the Mercury water quality criteria; however, since this discharge is not expected to be a source of PCBs and they are not typically found in wastewater, the facility will not have to monitor for PCB in this permit. There are no TMDLs affecting this facility at this time.

This permit imposes monthly monitoring for the following nutrient-related parameters: Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), and Nitrate plus Nitrite-Nitrogen (NO_2+NO_3N). Monitoring for these nutrient-related parameters is imposed so that sufficient information will be available regarding the nutrient contribution from this point source, should it be necessary at some later time to impose nutrient limits on this discharge. The monitoring frequency will be once per month.

This Permittee treats both municipal and industrial wastewater, and is classified as a major municipality. Therefore, the Department completed a Reasonable Potential Analysis (RPA) of the wastewater data submitted in Part D of the Permittee's application (i.e., per 40 CFR Par 122 Appendix J – Table 2) and data from the Permittee's Discharge Monitoring Reports. The RPA indicated whether any pollutants in the treated effluent have the potential to contribute to excursions of Alabama's in-stream water quality standards. The RPA was based on a 7Q10 of 35.090 cfs, a mean annual flow of 358.53 cfs, and a hardness of 69.2 mg/L. Background instream hardness data from station CL-2 was provided by the Department's Water Quality Branch. For this discharge, the RPA indicates that the following pollutants in the treated effluent may contribute to excursions of Alabama's in-stream water quality standards: Free Available Cyanide and Total Recoverable Silver. Cyanide has monthly average and daily maximum limits for 31.4 µg/L and 70.5 µg/L. While Silver showed a reasonable potential, typically Silver is not found in domestic wastewater; however, DMRs from Significant Industrial Discharge (SID) facilities that discharge into the Oxford collection system have included detectable amounts of silver; therefore, the Silver will be monitored since only one out of four samples of Oxford effluent included detectable levels of silver. The monitoring frequency for both Cyanide and Silver are once per month. Total Recoverable Cadmium and Total Recoverable Lead limits are not included in this permit based on the Reasonable Potential reassessment using the effluent DMR data for Cadmium and Lead showing no reasonable potential for those pollutants. Removing limits for Cadmium and Lead is not backsliding because it is consistent with the Department's anti-degradation policy and water quality standard are being attained. Cyanide was updated from Total Recoverable to Free Available based on ADEM's water quality criteria.

The Department revised bacteriological criteria in ADEM Administrative Code R.335-6-10-.09. As a result, this permit includes E. coli limits and seasons that are consistent with the revised regulations. The imposed E. coli limits were determined based on the water-use classification of the receiving stream. Since Choccolocco Creek is classified as Fish & Wildlife, the E. coli limits for summer (May through October) are 126 col/100 mL (monthly average) and 298 col/100 mL (daily maximum), while the limits

for the winter (November through April) are 548 col/ 100 mL (monthly average) and 2507 col/100 mL (daily maximum).

Total Residual Chlorine (TRC) limits are included in the permit. Monthly average and daily maximum TRC limitations of 0.066 mg/l and 0.115 mg/l, respectively, are being imposed at Outfall 0011. The TRC limits were developed based on EPA suggested WQ criteria and the Department's Permit Development Rationale, and should be protective of acute and chronic toxicity criteria in the receiving stream. If monitoring is not applicable during the monitoring period, enter "*9" on the monthly DMR. In accordance with a letter date August 11, 1998 from EPA Headquarters and a 1991 memorandum from EPA Region 4's Environmental Services Division (ESD), due to testing and method detection limitations, a Total Residual Chlorine measurement below 0.05 mg/L shall be considered below detection for compliance purposes. The monitoring frequency will be three times per week.

The Permittee has requested that PAA be included as a method of disinfection in the Permit. The PAA limit of 1.0 mg/L (daily maximum) is consistent with other Permit limits. Monitoring for PAA is only applicable if peracetic acid is utilized for disinfection purposes. Monitoring for PAA is required five days per week.

In the permit application, the Permittee reported two storm water outfalls from the permitted area. Outfalls 001 and 002 as reported in the application, will correspond to Outfalls 002S and 003S, respectively, in the permit. Storm water monitoring will be required on an annual basis. Dissolved Oxygen and Total Recoverable Chlorine were removed from storm water monitoring because they are not expected pollutants in storm water and they were inadvertently included in the previous permit.

Based on the Department's review of the application and receiving water conditions, chronic toxicity testing is warranted. This permit imposes toxicity testing for both Ceriodaphnia dubia and fathead minnows (Pimpehales). The Permittee will be required to test annually in the month of August. The IWC for this facility is 27 percent. However, the Permittee will be required to test toxicity (Chronic) on a quarterly basis when utilizing PAA. If monitoring is not applicable during a quarterly monitoring period enter "*9" on the DMRs when toxicity testing is not required.

The monitoring frequency for most parameters is three days per week. The monitoring frequency for nutrient-related parameters (TP, TKN, and NO_2+NO_3N) is once per month. Flow is to be monitored continuously as in the previous permit. The Permittee is required to monitor for turbidity five days per week at the effluent. The frequency of color monitoring has been increased to five days per week. The monitoring frequency for E. coli has been increased to five days per week. The monitoring frequency percent removals will be monthly.

ADEM Administrative Rule 335-6-10-.12 requires applicants to new or expanded discharges to Tier II waters demonstrate that the proposed discharge is necessary for important economic or social development in the area in which the waters are located. The application submitted by the facility is not for a new discharge or expanded discharge to a Tier II water, so the applicant is not required to demonstrate that the discharge is necessary for economic and social development.

Prepared by: Torbert

TOXICITY AND DISINFECTION RATIONALE

Facility Name:	**Oxford Tull C. Allen WWTP**	
NPDES Permit Number:	**AL0058408**	
Receiving Stream:	**Choccolocco Creek**	
Facility Design Flow (Qw):	**4.500 MGD**	
Receiving Stream 7Q10:	**19.810 cfs**	Does not include upstream POTW flow
Receiving Stream 7Q10:	**35.090 cfs**	Includes upsteam POTW flow
Receiving Stream 1Q10:	**15.360 cfs**	
Winter Headwater Flow (WHF):	**42.18 cfs**	
Summer Temperature for CCC:	**28 deg. Celsius**	
Winter Temperature for CCC:	**18 deg. Celsius**	
Headwater Background NH3-N Level:	**2.07 mg/l**	
Receiving Stream pH:	**7.0 s.u.**	
Headwater Background FC Level (summer):	**N./A.**	**(Only applicable for facilities with diffusers.)**
(winter)	**N./A.**	

The Stream Dilution Ration (SDR) is calculated using the 7Q10 for all stream classifications.

$$\text{Stream Dilution Ration (SDR)} = \frac{Qw}{7Q10 + Qw} = \textbf{16.56\%}$$

AMMONIA TOXICITY LIMITATIONS

Toxicity-based ammonia limits are calculated in accordance with the Ammonia Toxicity Protocol and the General Guidance for *Writing Water Quality Based Toxicity Permits.*

If the Limiting Dilution is less than 1%, the waterbody is considered stream-dominated and the CMC applies.
If the Limiting Dilution is greater than 1%, the waterbody is considered effluent-dominated and the CCC applies.

$$\text{Limiting Dilution} = \frac{Qw}{7Q10 + Qw}$$

= **16.56%** **Effluent-Dominated, CCC Applies**

Criterion Maximum Concentration (CMC): $CMC=0.411/(1+10(7.204-pH)) + 58.4/(1+10(pH-7.204))$

Criterion Continuous Concentration (CCC): $CCC=[0.0577/(1+10(7.688-pH)) + 2.487/(1+10(pH-7.688))] * Min[2.85,1.45*10(0.028*(25-T))]$

	CMC	CCC
Allowable Summer Instream NH3-N:	**36.09 mg/l**	**2.48 mg/l**
Allowable Winter Instream NH3-N:	**36.09 mg/l**	**4.72 mg/l**

$$\text{Summer NH3-N Toxicity Limit} = \frac{[(\text{Allowable Instream NH3-N}) * (7Q10 + Qw)] - [(\text{Headwater NH3-N}) * (7Q10)]}{Qw}$$

= **4.6 mg/l NH3-N at 7Q10**

$$\text{Winter NH3-N Toxicity Limit} = \frac{[(\text{Allowable Instream NH3-N}) * (WHF + Qw)] - [(\text{Headwater NH3-N}) * (WHF)]}{Qw}$$

= **20.8 mg/l NH3-N at Winter Flow**

The ammonia limits established in the permit will be the lesser of the DO-based ammonia limit (from the wasteload allocation model) or the toxicity limits calculated above.

	DO-based NH3-N limit	Toxicity-based NH3-N limit
Summer	**1.00 mg/l NH3-N**	**4.60 mg/l NH3-N**
Winter	**20.00 mg/l NH3-N**	**20.80 mg/l NH3-N**

Summer: The DO based limit of 1.00 mg/l NH3-N applies.
Winter: The DO based limit of 20.00 mg/l NH3-N applies.

TOXICITY TESTING REQUIREMENTS (REFERENCE: MUNICIPAL BRANCH TOXICITY PERMITTING STRATEGY)

The following factors trigger toxicity testing requirements:

1. Facility design flow is equal to or greater than 1.0 MGD (major facility).
2. There are significant industrial contributors (SID permits).

Acute toxicity testing is specified for A&I receiving streams, or for stream dilution ratios of 1% or less.
Chronic toxicity testing is specified for all other situations requiring toxicity testing.

Chronic toxicity testing is required

Instream Waste Concentration (IWC) = $\frac{Qw}{7Q10 + Qw}$ = **26.01%**

Note: This number will be rounded up for toxicity testing purposes.

DISINFECTION REQUIREMENTS

Bacteria limits are required, and will be the water quality limit for the receiving stream, except where diffusers are used the limit may be adjusted for the dilution provided by the diffuser.

See the attached Disinfection Guidance for applicable stream standards.

(Non-coastal limits apply)
Applicable Stream Classification: **Fish & Wildlife**
Disinfection Type: **Chlorination**
Limit calculation method: **Limits based on meeting stream standards at the point of discharge.**

	Stream Standard (colonies/100ml)	Effluent Limit (colonies/100ml)
E. Coli (applies to Non-coastal and Shellfish Harvesting Coastal)		
Monthly limit as monthly average (November through April):	548	**548**
Monthly limit as monthly aveage (May through October):	126	**126**
Daily Max (November through April):	2507	**2507**
Daily Max (May through October):	298	**298**
Enterococci (applies to Coastal)		
Monthly limit as geometric mean (Novembre through April):	Not applicable	**Not applicable**
Monthly limit as geometric mean (May through October):	Not applicable	**Not applicable**
Daily Max (November through April):	Not applicable	**Not applicable**
Daily Max (May through October):	Not applicable	**Not applicable**

MAXIMUM ALLOWABLE CHLORINATION LIMITS

Toxicity-based chlorine limits are calculated in accordance with the General Guidance for Writing Water Quality Based Toxicity Permits.

Chlorine has been shown to be acutely toxic at 0.019 mg/l and chronically toxic at 0.011 mg/l.

Maximum allowable TRC in effluent:	0.066 mg/l (chronic)	(0.011)/(SDR)
Maximum allowable TRC in effluent:	0.115 mg/l (acute)	(0.019)/(SDR)

NOTE: A maximum chlorine limit will be imposed such that the instream concentration will not exceed acutely toxic concentrations in A & I streams and chronically toxic concentrations in all other streams, but may not exceed 1.0 mg/l.

Prepared By: Shanda Torbert Date: 5/2/2019

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

February 21, 2019

MEMORANDUM

TO: Shanda Torbert, Industrial/Municipal Branch

FROM: Matthew Revel, Water Quality Branch

RE: Oxford Tull C. Allen WWTP Wasteload Allocation

The Water Quality Branch (WQB) received a request for an updated wasteload allocation for Oxford Tull C. Allen WWTP (AL0058408) and reviewed the available information concerning this wasteload allocation. The WQB is currently updating the model that includes this discharge with data from an intensive survey conducted on Choccolocco Creek during the summer of 2018. At this time, the WQB recommends that the permit be reissued with the existing limits for DO, $CBOD_5$, and NH_3-N until the new model is developed. The following table provides updated flows immediately upstream of the discharge.

7Q10	19.81 cfs
7Q2	42.18 cfs
1Q10	15.36 cfs
Annual Average	358.53 cfs

MFR: mfr

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
4171 Commanders Drive
Mobile, AL 36615-1421
(251) 432-6533
(251) 432-6598 (FAX)

Waste Load Allocation Summary

Comments Included: ☐ Yes ☑ No

General Information

Information Verified By: DWT

Receiving Stream Name	Choccolocco Creek
Year File Was Created	1985
Previous File Name	
OR: Local Name (If applicable)	
Facility Name	Oxford Tull C Allen WWTP
Previous Discharger Name	Oxford
Or-AKA (includes previous file name)	
11 Digit HUC Code	03150106250
12 Digit HUC Code	031501060607
River Basin	Coosa
County	Talladega
Use Classification	F&W
Date of WLA Response	8/10/2007
Discharge Latitude	33.58021
Lat/Long Method	Arcview
Discharge Longitude	-85.91541
Site Visit Completed?	☑ Yes ☐ No
Approved TMDL?	☐ Yes ☑ No
Date of Site Visit	8/1/2007
Approval Date of TMDL	
Waterbody Impaired?	☑ Yes ☐ No
Antidegradation	☐ Yes ☑ No
Waterbody Tier Level	Tier I
Use Support Category	5
Other Point Sources?	☑ Yes ☐ No

Print Record | Close Form

Permit Information

Permit Number	AL0058408
Permit Status	Active

Sources Included in Model

Anniston Choccolocco WWTP
NGC Industries, Inc. WWTP
Anniston Army Depot WWTP

Type of Discharger

- ☑ Municipal
- ☐ Industrial
- ☐ Semipublic/Private
- ☐ Mining

Waste Load Allocation Information

Modeled Reach Length	30.17 Miles	Date of Allocation	8/9/2007
Name of Model Used	SWQM	Allocation Type	2 Seasons
Model Completed by	David Thompson	Type of Model Used	Desk-top
Allocation Developed by	Water Quality Branch		

Waste Load Allocation Summary

Annual Effluent Limits

Qw: MGD

CBOD5:

NH3-N:

TKN:

D.O.:

Conventional Parameters

	Qw 4.9 MGD	Qw 4.9 MGD
Season	Summer	Winter
From	May	Dec
Through	Nov	Apr
CBOD5	8 mg/L	25 mg/L
NH3-N	1 mg/L	20 mg/L
TKN		
D.O.	6 mg/L	6 mg/L

Other Parameters

	Qw: MGD	Qw: MGD
Season		
From		
Through		
TP		
TN		
TSS		

"Monitor Only" Parameters for Effluent:

Parameter	Frequency	Parameter	Frequency

Water Quality Characteristics Immediately Upstream of Discharge

Parameter	Summer		Winter	
CBODu		mg/l		mg/l
NH3-N		mg/l		mg/l
Temperature		°C		°C
pH		su		su

Hydrology at Discharge Location

Drainage Area Qualifier: Exact

			Method Used to Calculate
Drainage Area	251	sq mi	
Stream 7Q10	45	cfs	ADEM Estimate w/USGS Gage Data
Stream 1Q10	33.75	cfs	75%of 7Q10
Stream 7Q2	72	cfs	ADEM Estimate w/USGS Gage Data
Annual Average	377	cfs	ADEM Estimate w/USGS Gage Data

Comments and/or Notations

If comments are made, check the "yes" box at the top of page one

Last Revision: 07/15/09

Please print or type in the unshaded areas only.

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F	AL0058408		D

LABEL ITEMS

- I. EPA I.D. NUMBER
- III. FACILITY NAME
- V. FACILITY MAILING ADDRESS
- VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

RECEIVED
MAR 02 2016
IND / MUN BRANCH

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)	X (16)	(17)	X (18)
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)	(19)	X (20)	(21)
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	(22)	X (23)	(24)
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)	(25)	X (26)	(27)
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	(28)	X (29)	(30)
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	(31)	X (32)	(33)
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	(34)	X (35)	(36)
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	(37)	X (38)	(39)
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	(40)	X (41)	(42)
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)	(43)	X (44)	(45)

III. NAME OF FACILITY

1 | SKIP | Oxford Tull C. Allen Wastewater Treatment Plant

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 Livingston, Wayne - General Manager	(256) 831-5618

V. FACILTY MAILING ADDRESS

A. STREET OR P.O. BOX

3 600 Barry Street, PO Box 3663

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 Oxford	AL	36203

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 2975 Silver Run Road

B. COUNTY NAME

Talladega

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 Oxford	AL	36203	

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 *(specify)* Sewerage Systems	7 *(specify)*
C. THIRD	**D. FOURTH**
7 *(specify)*	7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME	B. Is the name listed in Item VIII-A also the owner?
8 Oxford Water Works & Sewer Board	☑ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other," specify.)*	D. PHONE *(area code & no.)*
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC *(other than federal or state)*, O = OTHER *(specify)*: M *(specify)*	A (256) 831-5618

E. STREET OR P.O. BOX: PO Box 3663

F. CITY OR TOWN	G. STATE	H. ZIP CODE	IX. INDIAN LAND
B Oxford	AL	36203	Is the facility located on Indian lands? ☐ YES ☑ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*
9 N AL0058408	9 P
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
9 U	9 *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
9 R	9 *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

The Oxford Tull C. Allen Wastewater Treatment Plant is capable of treating 4.5 MGD of municipal and industrial wastewater from the Oxford service area. It consists of a mechanical screen, vortex grit chamber (with grit pump and classifier), equalization basin, aeration basin (oxidation ditch), 2 secondary clarifiers, chlorination, dechlorination, cascade post aeration, waste sludge lagoon (capacity of 1.1 MG), sludge drying beds, sludge drying cans, sludge disposal to landfill. The treated effluent is discharged to Choccolocco Creek.

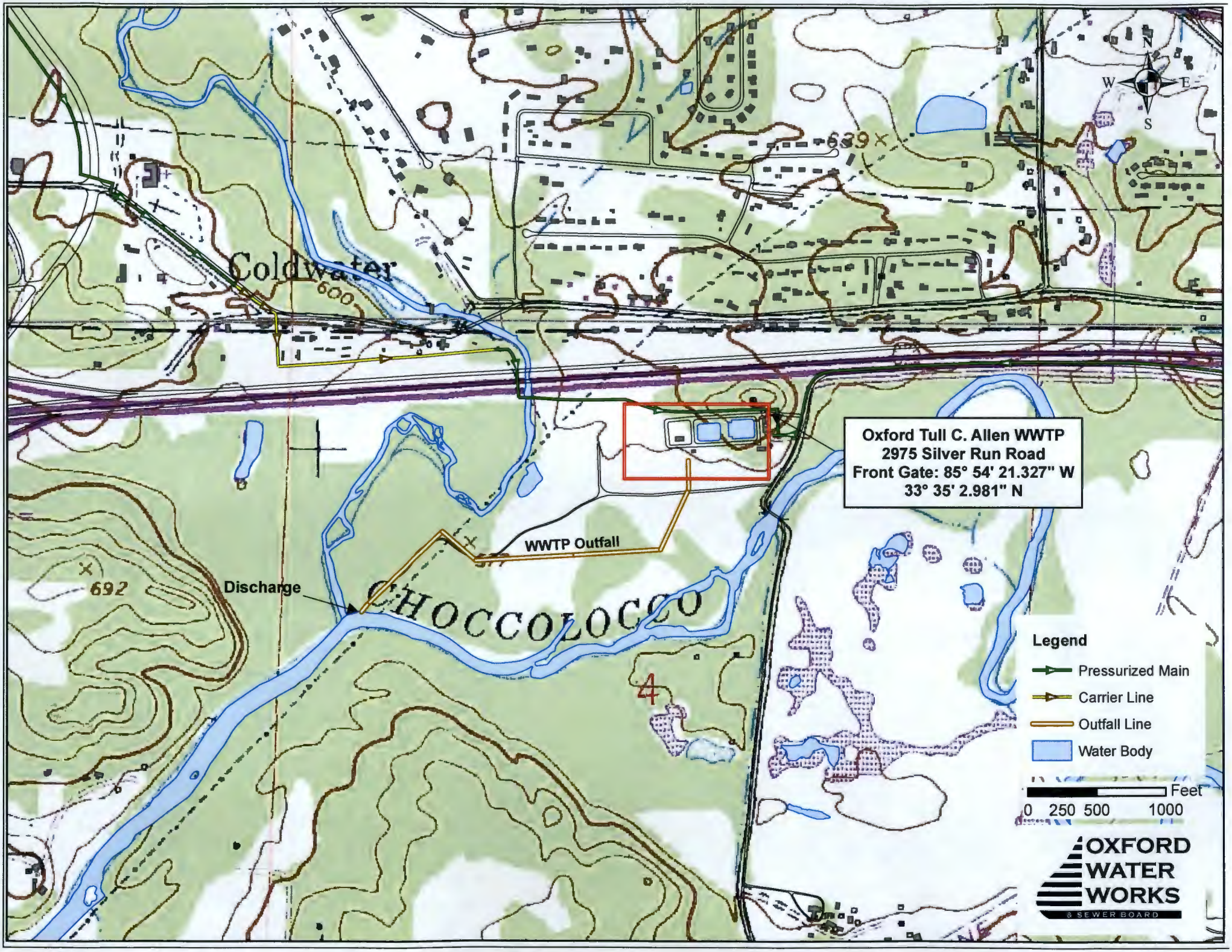
XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
Wayne Livingston, General Manager	Wayne Livingston	2/27/18

COMMENTS FOR OFFICIAL USE ONLY

C


Coldwater
600
639
692
CHOCCOLOCCO
Discharge
WWTP Outfall
Oxford Tull C. Allen WWTP
2975 Silver Run Road
Front Gate: 85° 54' 21.327" W
33° 35' 2.981" N
N
W
E
S
Legend
Pressurized Main
Carrier Line
Outfall Line
Water Body
Feet
0 250 500 1000
OXFORD
WATER
WORKS
& SEWER BOARD

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

FORM 2A NPDES

NPDES FORM 2A APPLICATION OVERVIEW

APPLICATION OVERVIEW

Form 2A has been developed in a modular format and consists of a "Basic Application Information" packet and a "Supplemental Application Information" packet. The Basic Application Information packet is divided into two parts. All applicants must complete Parts A and C. Applicants with a design flow greater than or equal to 0.1 mgd must also complete Part B. Some applicants must also complete the Supplemental Application Information packet. The following items explain which parts of Form 2A you must complete.

BASIC APPLICATION INFORMATION:

A. **Basic Application Information for all Applicants.** All applicants must complete questions A.1 through A.8. A treatment works that discharges effluent to surface waters of the United States must also answer questions A.9 through A.12.

B. **Additional Application Information for Applicants with a Design Flow ≥ 0.1 mgd.** All treatment works that have design flows greater than or equal to 0.1 million gallons per day must complete questions B.1 through B.6.

C. **Certification.** All applicants must complete Part C (Certification).

SUPPLEMENTAL APPLICATION INFORMATION:

D. **Expanded Effluent Testing Data.** A treatment works that discharges effluent to surface waters of the United States and meets one or more of the following criteria must complete Part D (Expanded Effluent Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to provide the information.

E. **Toxicity Testing Data.** A treatment works that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to submit results of toxicity testing.

F. **Industrial User Discharges and RCRA/CERCLA Wastes.** A treatment works that accepts process wastewater from any significant industrial users (SIUs) or receives RCRA or CERCLA wastes must complete Part F (Industrial User Discharges and RCRA/CERCLA Wastes). SIUs are defined as:

1. All industrial users subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations (CFR) 403.6 and 40 CFR Chapter I, Subchapter N (see instructions); and
2. Any other industrial user that:
   a. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions); or
   b. Contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or
   c. Is designated as an SIU by the control authority.

G. **Combined Sewer Systems.** A treatment works that has a combined sewer system must complete Part G (Combined Sewer Systems).

ALL APPLICANTS MUST COMPLETE PART C (CERTIFICATION)

Form Approved 1/14/99
OMB Number 2040-0086

BASIC APPLICATION INFORMATION

PART A. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS:

All treatment works must complete questions A.1 through A.8 of this Basic Application Information packet.

A.1. Facility Information.

Facility name: Oxford Tull C. Allen Wastewater Treatment Plant

Mailing Address: PO Box 3663
Oxford, AL 36203

Contact person: Wayne Livingston

Title: General Manager

Telephone number: (256) 831-5618

Facility Address (not P.O. Box): 2975 Silver Run Road
Oxford, AL 36203

A.2. Applicant Information. If the applicant is different from the above, provide the following:

Applicant name: Oxford Water Works & Sewer Board

Mailing Address: PO Box 3663
Oxford, AL 36203

Contact person: Wayne Livingston

Title: General Manager

Telephone number: (256) 831-5618

Is the applicant the owner or operator (or both) of the treatment works?

✓ owner ✓ operator

Indicate whether correspondence regarding this permit should be directed to the facility or the applicant.

_____ facility ✓ applicant

A.3. Existing Environmental Permits. Provide the permit number of any existing environmental permits that have been issued to the treatment works (include state-issued permits).

NPDES	AL 0058408	PSD	
UIC		Other	
RCRA		Other	

A.4. Collection System Information. Provide information on municipalities and areas served by the facility. Provide the name and population of each entity and, if known, provide information on the type of collection system (combined vs. separate) and its ownership (municipal, private, etc.).

Name	Population Served	Type of Collection System	Ownership
Oxford	10,426	Sanitary	Municipal

Total population served 10,426

A.5. Indian Country.

a. Is the treatment works located in Indian Country?

_____ Yes ✓ No

b. Does the treatment works discharge to a receiving water that is either in Indian Country or that is upstream from (and eventually flows through) Indian Country?

_____ Yes ✓ No

A.6. Flow. Indicate the design flow rate of the treatment plant (i.e., the wastewater flow rate that the plant was built to handle). Also provide the average daily flow rate and maximum daily flow rate for each of the last three years. Each year's data must be based on a 12-month time period with the 12th month of "this year" occurring no more than three months prior to this application submittal.

a. Design flow rate 4.50 mgd

	Two Years Ago	Last Year	This Year	
b. Annual average daily flow rate	3.83	3.93	3.85	mgd
c. Maximum daily flow rate	5.50	5.60	6.02	mgd

A.7. Collection System. Indicate the type(s) of collection system(s) used by the treatment plant. Check all that apply. Also estimate the percent contribution (by miles) of each.

✓ Separate sanitary sewer	100.00 %
_____ Combined storm and sanitary sewer	_____ %

A.8. Discharges and Other Disposal Methods.

a. Does the treatment works discharge effluent to waters of the U.S.? ✓ Yes _____ No

If yes, list how many of each of the following types of discharge points the treatment works uses:

i. Discharges of treated effluent 001

ii. Discharges of untreated or partially treated effluent _____

iii. Combined sewer overflow points _____

iv. Constructed emergency overflows (prior to the headworks) _____

v. Other _____ _____

b. Does the treatment works discharge effluent to basins, ponds, or other surface impoundments that do not have outlets for discharge to waters of the U.S.? _____ Yes ✓ No

If yes, provide the following for each surface impoundment:

Location: _____

Annual average daily volume discharged to surface impoundment(s) _____ mgd

Is discharge _____ continuous or _____ intermittent?

c. Does the treatment works land-apply treated wastewater? _____ Yes ✓ No

If yes, provide the following for each land application site:

Location: _____

Number of acres: _____

Annual average daily volume applied to site: _____ Mgd

Is land application _____ continuous or _____ intermittent?

d. Does the treatment works discharge or transport treated or untreated wastewater to another treatment works? _____ Yes ✓ No

If yes, describe the mean(s) by which the wastewater from the treatment works is discharged or transported to the other treatment works (e.g., tank truck, pipe).

If transport is by a party other than the applicant, provide:

Transporter name:

Mailing Address:

Contact person:

Title:

Telephone number:

For each treatment works that receives this discharge, provide the following:

Name:

Mailing Address:

Contact person:

Title:

Telephone number:

If known, provide the NPDES permit number of the treatment works that receives this discharge.

Provide the average daily flow rate from the treatment works into the receiving facility. mgd

e. Does the treatment works discharge or dispose of its wastewater in a manner not included in A.8.a through A.8.d above (e.g., underground percolation, well injection)? Yes ✓ No

If yes, provide the following for each disposal method:

Description of method (including location and size of site(s) if applicable):

Annual daily volume disposed of by this method:

Is disposal through this method continuous or intermittent?

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

WASTEWATER DISCHARGES:

If you answered "yes" to question A.8.a, complete questions A.9 through A.12 **once for each outfall** (including bypass points) through which effluent is discharged. Do not include information on combined sewer overflows in this section. **If you answered "no" to question A.8.a**, go to Part B, "Additional Application Information for Applicants with a Design Flow Greater than or Equal to 0.1 mgd."

A.9. Description of Outfall.

a. Outfall number 001

b. Location
Oxford (City or town, if applicable) 36203 (Zip Code)
Talladega (County) Alabama (State)
33d 34' 48" (Latitude) 85d 54' 58" (Longitude)

c. Distance from shore (if applicable) _____ ft.

d. Depth below surface (if applicable) _____ ft.

e. Average daily flow rate 4.50 mgd

f. Does this outfall have either an intermittent or a periodic discharge? _____ Yes ✓ No (go to A.9.g.)

If yes, provide the following information:

Number of times per year discharge occurs: _____

Average duration of each discharge: _____

Average flow per discharge: _____ mgd

Months in which discharge occurs: _____

g. Is outfall equipped with a diffuser? _____ Yes ✓ No

A.10. Description of Receiving Waters.

a. Name of receiving water Choccolocco Creek

b. Name of watershed (if known) Middle Coosa Watershed

United States Soil Conservation Service 14-digit watershed code (if known): _____

c. Name of State Management/River Basin (if known): _____

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): _____

d. Critical low flow of receiving stream (if applicable):
acute _____ cfs chronic 45.00 cfs

e. Total hardness of receiving stream at critical low flow (if applicable): _____ mg/l of $CaCO_3$

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

A.11. Description of Treatment.

a. What levels of treatment are provided? Check all that apply.

_____ Primary ✓ Secondary

_____ Advanced _____ Other. Describe: _____

b. Indicate the following removal rates (as applicable):

Design BOD_5 removal or Design $CBOD_5$ removal	85.00	%
Design SS removal	85.00	%
Design P removal		%
Design N removal		%
Other _____		%

c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe.

Peracetic acid (backup chlorination/dechlorination)

If disinfection is by chlorination, is dechlorination used for this outfall? _____ Yes _____ No

d. Does the treatment plant have post aeration? ✓ Yes _____ No

A.12. Effluent Testing Information. All Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart.

Outfall number: 001

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	6.40	s.u.			
pH (Maximum)	8.20	s.u.			
Flow Rate	5.55	MGD	3.81	MGD	1,068.00
Temperature (Winter)					
Temperature (Summer)					

* For pH please report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
		Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.								
BIOCHEMICAL OXYGEN	BOD-5							
DEMAND (Report one)	CBOD-5	5.90	mg/L	3.43	mg/L	3.00	M5210 B2001	2.0
FECAL COLIFORM		2,017.00	#/100ml	153.33	#/100ml	468.00	EPA 1603	1.0
TOTAL SUSPENDED SOLIDS (TSS)		12.00	mg/L	6.67	mg/L	3.00	USGS3765	1

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

BASIC APPLICATION INFORMATION

PART B. ADDITIONAL APPLICATION INFORMATION FOR APPLICANTS WITH A DESIGN FLOW GREATER THAN OR EQUAL TO 0.1 MGD (100,000 gallons per day).

All applicants with a design flow rate ≥ 0.1 mgd must answer questions B.1 through B.6. All others go to Part C (Certification).

B.1. Inflow and Infiltration. Estimate the average number of gallons per day that flow into the treatment works from inflow and/or infiltration.

100,000.00 gpd

Briefly explain any steps underway or planned to minimize inflow and infiltration.

TV existing sewer mains and repairing any infiltration/inflow problems encountered. Replacing old lines.

B.2. Topographic Map. Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. (You may submit more than one map if one map does not show the entire area.)

a. The area surrounding the treatment plant, including all unit processes.

b. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.

c. Each well where wastewater from the treatment plant is injected underground.

d. Wells, springs, other surface water bodies, and drinking water wells that are: 1) within 1/4 mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.

e. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.

f. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, and/or disposed.

B.3. Process Flow Diagram or Schematic. Provide a diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. Also provide a water balance showing all treatment units, including disinfection (e.g, chlorination and dechlorination). The water balance must show daily average flow rates at influent and discharge points and approximate daily flow rates between treatment units. Include a brief narrative description of the diagram.

B.4. Operation/Maintenance Performed by Contractor(s).

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor? ____Yes ✓ No

If yes, list the name, address, telephone number, and status of each contractor and describe the contractor's responsibilities (attach additional pages if necessary).

Name: _____

Mailing Address: _____

_____

Telephone Number: _____

Responsibilities of Contractor: _____

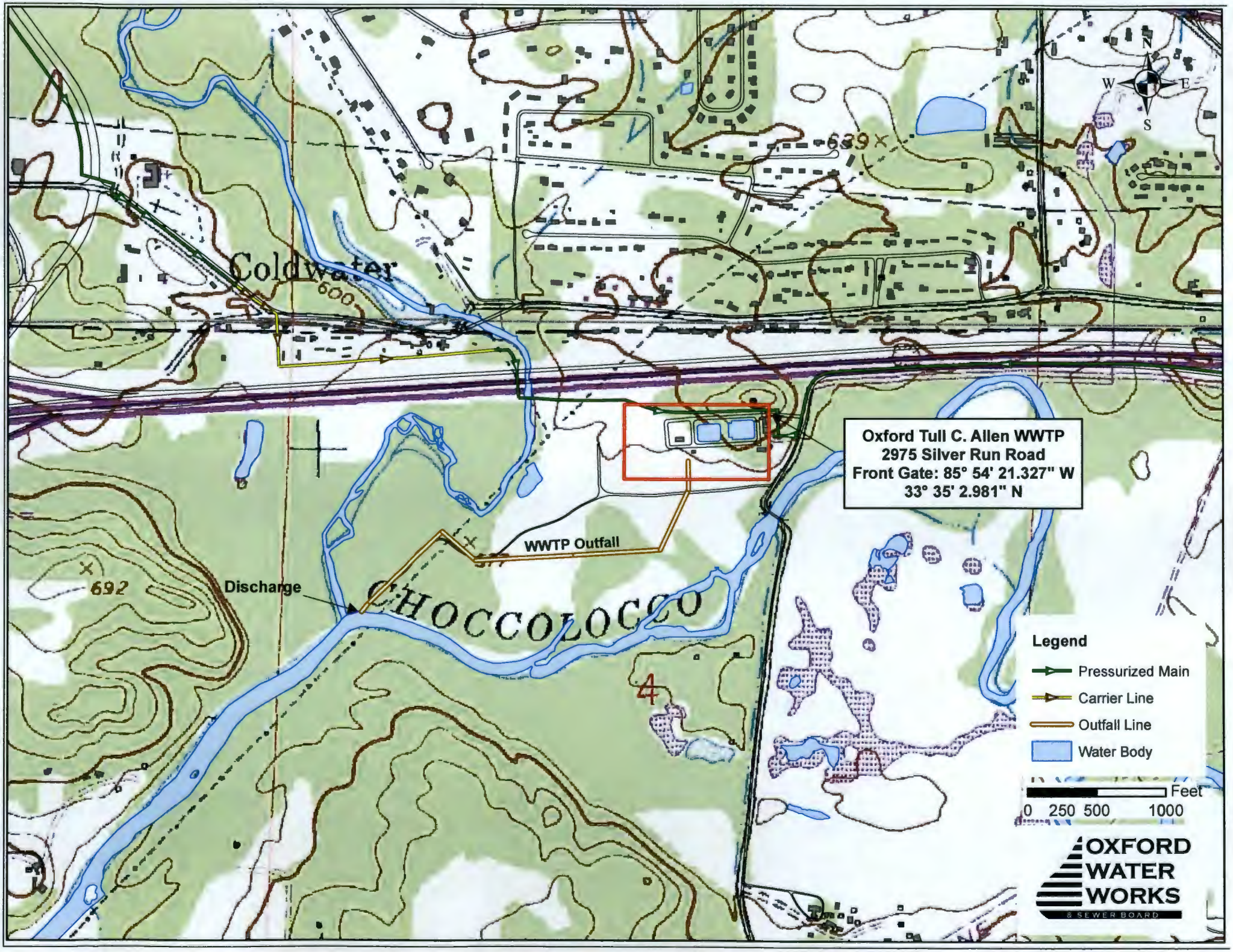
B.5. Scheduled Improvements and Schedules of Implementation. Provide information on any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses to question B.5 for each. (If none, go to question B.6.)

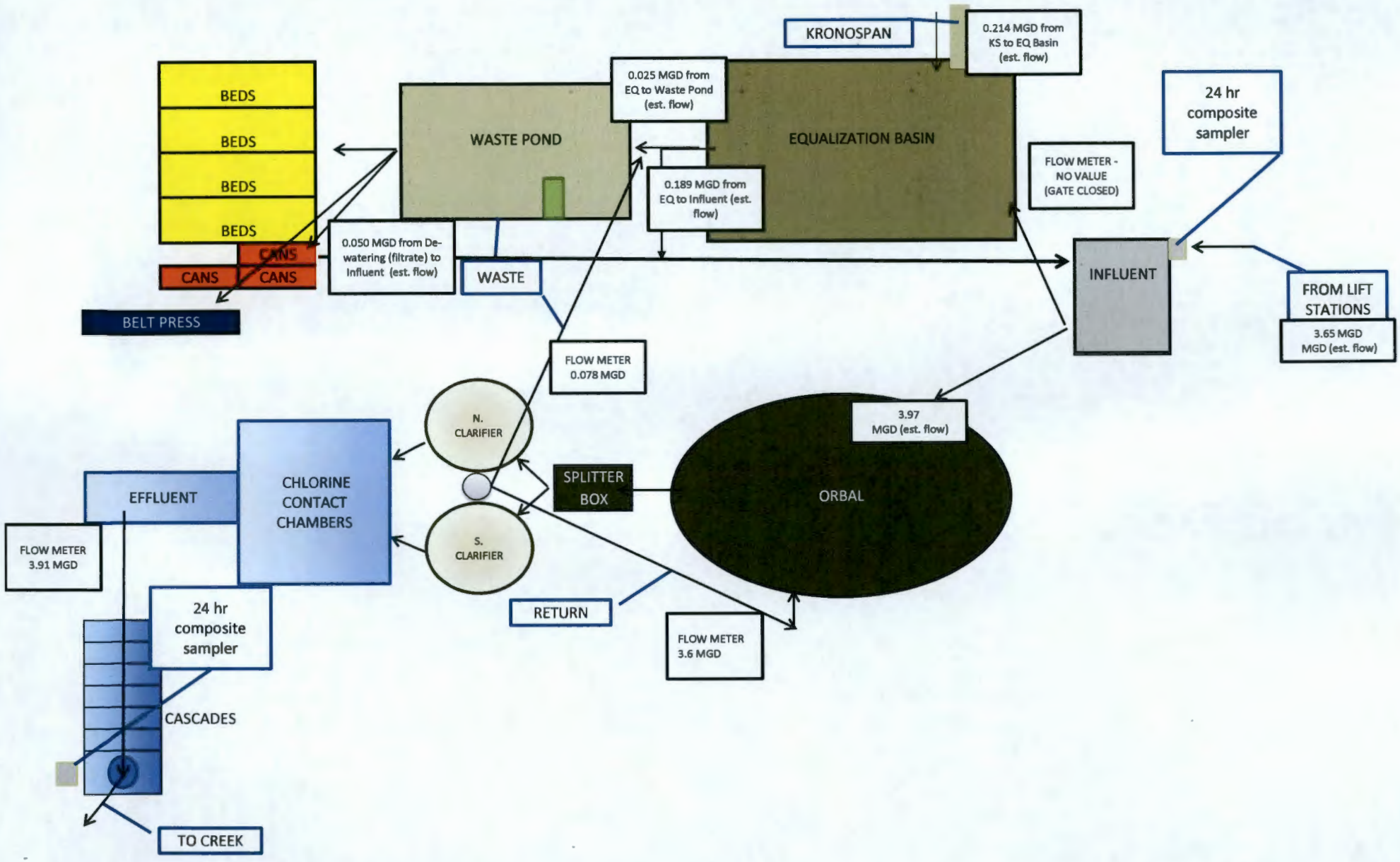
a. List the outfall number (assigned in question A.9) for each outfall that is covered by this implementation schedule.

None scheduled

b. Indicate whether the planned improvements or implementation schedule are required by local, State, or Federal agencies.

____Yes ✓ No


Coldwater
600
639
692
CHOCCOLOCCO
Discharge
WWTP Outfall
Oxford Tull C. Allen WWTP
2975 Silver Run Road
Front Gate: 85° 54' 21.327" W
33° 35' 2.981" N
N
W
E
S
Legend
Pressurized Main
Carrier Line
Outfall Line
Water Body
Feet
0 250 500 1000
OXFORD
WATER
WORKS
& SEWER BOARD


KRONOSPAN
0.214 MGD from KS to EQ Basin (est. flow)
BEDS
BEDS
BEDS
BEDS
CANS
CANS
CANS
BELT PRESS
WASTE POND
0.025 MGD from EQ to Waste Pond (est. flow)
EQUALIZATION BASIN
0.189 MGD from EQ to Influent (est. flow)
FLOW METER - NO VALUE (GATE CLOSED)
24 hr composite sampler
0.050 MGD from De-watering (filtrate) to Influent (est. flow)
WASTE
INFLUENT
FROM LIFT STATIONS
3.65 MGD MGD (est. flow)
FLOW METER 0.078 MGD
N. CLARIFIER
3.97 MGD (est. flow)
SPLITTER BOX
ORBAL
EFFLUENT
CHLORINE CONTACT CHAMBERS
FLOW METER 3.91 MGD
S. CLARIFIER
24 hr composite sampler
RETURN
FLOW METER 3.6 MGD
CASCADES
TO CREEK

c If the answer to B.5.b is "Yes," briefly describe, including new maximum daily inflow rate (if applicable).

_____

d. Provide dates imposed by any compliance schedule or any actual dates of completion for the implementation steps listed below, as applicable. For improvements planned independently of local, State, or Federal agencies, indicate planned or actual completion dates, as applicable. Indicate dates as accurately as possible.

Implementation Stage	Schedule MM / DD / YYYY	Actual Completion MM / DD / YYYY
– Begin construction	___/___/_____	___/___/_____
– End construction	___/___/_____	___/___/_____
– Begin discharge	___/___/_____	___/___/_____
– Attain operational level	___/___/_____	___/___/_____

e. Have appropriate permits/clearances concerning other Federal/State requirements been obtained? ____Yes ____No

Describe briefly: N/A

B.6. EFFLUENT TESTING DATA (GREATER THAN 0.1 MGD ONLY).

Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall Number: 001

POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
	Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.							
AMMONIA (as N)	0.34	mg/l	0.21	mg/l	3.00	4500-NH3 BD199	0.05
CHLORINE (TOTAL RESIDUAL, TRC)	0.08	mg/l	0.03	mg/l	468.00	SM4500-Cl	0.01
DISSOLVED OXYGEN	8.86	mg/l	8.14	mg/l	468.00	SM4500-OG	0.05
TOTAL KJELDAHL NITROGEN (TKN)	6.84	mg/l	3.36	mg/l	3.00	M4500-N B	0.05
NITRATE PLUS NITRITE NITROGEN	3.10	mg/l	2.59	mg/l	3.00	M4500-NO3 H	0.10
OIL and GREASE	1.80	mg/l	1.27	mg/l	3.00	E1664A	1.0
PHOSPHORUS (Total)	1.62	mg/l	0.71	mg/l	30.00	M4500-P B5	0.05
TOTAL DISSOLVED SOLIDS (TDS)	412.00	mg/l	321.00	mg/l	3.00	M2540 C	20
OTHER							

END OF PART B.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

BASIC APPLICATION INFORMATION

PART C. CERTIFICATION

All applicants must complete the Certification Section. Refer to instructions to determine who is an officer for the purposes of this certification. All applicants must complete all applicable sections of Form 2A, as explained in the Application Overview. Indicate below which parts of Form 2A you have completed and are submitting. By signing this certification statement, applicants confirm that they have reviewed Form 2A and have completed all sections that apply to the facility for which this application is submitted.

Indicate which parts of Form 2A you have completed and are submitting:

✓ Basic Application Information packet

Supplemental Application Information packet:

✓ Part D (Expanded Effluent Testing Data)

✓ Part E (Toxicity Testing: Biomonitoring Data)

✓ Part F (Industrial User Discharges and RCRA/CERCLA Wastes)

____ Part G (Combined Sewer Systems)

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

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 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.

Name and official title: Wayne Livingston

Signature: Wayne Livingston

Telephone number: (256) 831-5618

Date signed: 2/27/18

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

SEND COMPLETED FORMS TO:

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

Effluent Testing: 1.0 mgd and Pretreatment Treatment Works. If the treatment works has a design flow greater than or equal to 1.0 mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be *based* on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.											
ANTIMONY	0.076	mg/L	--	--	0.038	mg/L	--	--	3	E200.9	0.005
ARSENIC	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.9	0.001
BERYLLIUM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.7	0.001
CADMIUM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.7	0.001
CHROMIUM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.7	0.010
COPPER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.7	0.010
LEAD	0.007	mg/L	--	--	0.0057	mg/L	--	--	3	E200.7	0.005
MERCURY	5.6	ng/L	--	--	2.97	ng/L	--	--	3	E1631	0.40
NICKEL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.7	0.050
SELENIUM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.9	0.005
SILVER	0.002	mg/L	--	--	0.0013	mg/L	--	--	3	E200.9	0.001
THALLIUM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E200.9	0.001
ZINC	0.066	mg/L	--	--	0.055	mg/L	--	--	3	E200.7	0.050
CYANIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	M4500-CN CE	0.010
TOTAL PHENOLIC COMPOUNDS	BDL	mg/L	--	--	BDL	mg/L	--	--	3	M510 AC	0.10
HARDNESS (AS $CaCO_3$)	161	mg/L	--	--	155	mg/L	--	--	3	E200.7	1.00
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer.											

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
VOLATILE ORGANIC COMPOUNDS.											
ACROLEIN	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.100
ACRYLONITRILE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.100
BENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
BROMOFORM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
CARBON TETRACHLORIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
CLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
CHLORODIBROMO-METHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
CHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.010
2-CHLORO-ETHYLVINYL ETHER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.010
CHLOROFORM	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
DICHLOROBROMO-METHANE	0.011	mg/L	--	--	0.007	mg/L	--	--	3	E624	0.005
1,1-DICHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,2-DICHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
TRANS-1,2-DICHLORO-ETHYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,1-DICHLOROETHYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,2-DICHLOROPROPANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,3-DICHLORO-PROPYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
ETHYLBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
METHYL BROMIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.010
METHYL CHLORIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
METHYLENE CHLORIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,1,2,2-TETRACHLORO-ETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
TETRACHLORO-ETHYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
TOLUENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: _____ (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
1,1,1-TRICHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
1,1,2-TRICHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
TRICHLORETHYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.005
VINYL CHLORIDE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E624	0.002
Use this space (or a separate sheet) to provide information on other volatile organic compounds requested by the permit writer.											
ACID-EXTRACTABLE COMPOUNDS											
P-CHLORO-M-CRESOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2-CHLOROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2,4-DICHLOROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2,4-DIMETHYLPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
4,6-DINITRO-O-CRESOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.050
2,4-DINITROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.050
2-NITROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
4-NITROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.050
PENTACHLOROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.025
PHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2,4,6-TRICHLOROPHENOL	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
Use this space (or a separate sheet) to provide information on other acid-extractable compounds requested by the permit writer.											
BASE-NEUTRAL COMPOUNDS.											
ACENAPHTHENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
ACENAPHTHYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
ANTHRACENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BENZIDINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.050
BENZO(A)ANTHRACENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BENZO(A)PYRENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
3,4 BENZO-FLUORANTHENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BENZO(GHI)PERYLENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BENZO(K)FLUORANTHENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BIS (2-CHLOROETHOXY) METHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BIS (2-CHLOROETHYL)-ETHER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BIS (2-CHLOROISO-PROPYL) ETHER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BIS (2-ETHYLHEXYL) PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
4-BROMOPHENYL PHENYL ETHER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
BUTYL BENZYL PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2-CHLORONAPHTHALENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
4-CHLORPHENYL PHENYL ETHER	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
CHRYSENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
DI-N-BUTYL PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
DI-N-OCTYL PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
DIBENZO(A,H) ANTHRACENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
1,2-DICHLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.005
1,3-DICHLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.005
1,4-DICHLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.005
3,3-DICHLOROBENZIDINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.020
DIETHYL PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
DIMETHYL PHTHALATE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2,4-DINITROTOLUENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
2,6-DINITROTOLUENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
1,2-DIPHENYLHYDRAZINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.050

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: _____ (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
FLUORANTHENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
FLUORENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
HEXACHLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
HEXACHLOROBUTADIENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
HEXACHLOROCYCLO-PENTADIENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
HEXACHLOROETHANE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
INDENO(1,2,3-CD)PYRENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
ISOPHORONE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
NAPHTHALENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
NITROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
N-NITROSODI-N-PROPYLAMINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
N-NITROSODI- METHYLAMINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
N-NITROSODI-PHENYLAMINE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
PHENANTHRENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
PYRENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010
1,2,4-TRICHLOROBENZENE	BDL	mg/L	--	--	BDL	mg/L	--	--	3	E625	0.010

Use this space (or a separate sheet) to provide information on other base-neutral compounds requested by the permit writer.

Use this space (or a separate sheet) to provide information on other pollutants (e.g., pesticides) requested by the permit writer.

END OF PART D.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

	Units	2/17/2014	7/13/2015	9/26/2016	2/13/2017	Avg
Analyses						
Silver, TREC, by GFAA						
Silver, as Ag	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Arsenic, TREC for NPDES						
Arsenic, as As	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total Hardness						
Hardness, Calcium/Magnesium (as CaCO3)	mg/L	144	160	161	153	158
Hardness, Calcium (as CaCO3)	mg/L	79.6	87.2	83	78.6	82.93333
Hardness, Magnesium (as CaCO3)	mg/L	64.9	73	77.9	74.4	75.1
ICP Metals, Total Recoverable						
Beryllium, as Be	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, as Cd	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium, as Cr	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Copper, as Cu	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Lead, as Pb	mg/L	<0.005	0.007	<0.005	<0.005	0.005667
Nickel, as Ni	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Zinc, as Zn	mg/L	<0.050	0.066	<0.050	<0.050	0.055333
Antimony, TREC for NPDES						
Antimony, as Sb	mg/L	0.02	0.076	0.026	0.013	0.038333
Selenium, TREC for NPDES						
Selenium, as Se	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, Total Recoverable for NPDES						
Thallium, as Tl	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-volatile Organics by 625						
1,2,4-Trichlorobenzene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
1,2-Dephenylhydrazine	mg/L	<0.052	<0.054	<0.050	<0.050	<0.052
2,4,6-Trichlorophenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2,4-Dichlorophenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2,4-Dimethylphenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2,4-Dinitrophenol	mg/L	<0.052	<0.054	<0.050	<0.050	<0.052
2,4-Dinitrotoluene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2,6-Dinitrotoluene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2-Chloronaphthalene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2-Chlorophenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
2-Nitrophenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
3,3'-Dichlorobenzidine	mg/L	<0.021	<0.022	<0.020	<0.020	<0.021
4,6-Dinitro-2-methylphenol	mg/L	<0.052	<0.054	<0.050	<0.050	<0.052
4-Bromophenyl phenyl ether	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
4-Chloro-3-methylphenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
4-Chlorophenyl phenyl ether	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010

	Units	2/17/2014	7/13/2015	9/26/2016	2/13/2017	Avg
4-Nitrophenol	mg/L	<0.052	<0.054	<0.050	<0.050	<0.052
Acenaphthene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Acenaphthylene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Anthracene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Benz(A)anthracene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Benzidine	mg/L	<0.052	<0.054	<0.050	<0.050	<0.052
Benzo(a)pyrene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Bis(2-chloroethoxy)methane	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Bis(2-chloroethyl)ether	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Bis(2-chloroisopropyl)ether	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Bis(2-ethylhexyl)phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Butyl benzyl phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Chrysene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Dibenz(a,h)anthracene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Diethyl phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Dimethyl phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Di-n-butyl phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Di-n-octyl phthalate	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Fluoranthene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Fluorene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Hexachlorobenzene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Hexachlorobutadiene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Hexachlorocyclopentadiene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Hexachloroethane	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Isophorone	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Naphthalene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Nitrobenzene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
N-Nitrosodimethylamine	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
N-Nitrosodi-n-propylamine	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
N-Nitrosodiphenylamine	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Pentachlorophenol	mg/L	<0.026	<0.027	<0.025	<0.025	<0.026
Phenanthrene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Phenol	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
Pyrene	mg/L	<0.010	<0.011	<0.010	<0.010	<0.010
CBOD, 5 Day 20°C						
Carbonaceous Biochemical Oxygen Demand	mg/L	27.2	5.9	<2.0	2.4	3.433333
Ammonia, as N						
Nitrogen, Ammonia as N	mg/L	0.34	0.08	<0.05	0.13	0.086667
Nitrite by Spectrophotometer						
Nitrogen, Nitrite, as NO2-N	mg/L	<0.10	1.8	<0.10	<0.10	0.666667

	Units	2/17/2014	7/13/2015	9/26/2016	2/13/2017	Avg
Total NO2-NO3 and NO3 by Spectrophotometer						
Total Nitrate-Nitrite, mg/L as N	mg/L	<0.10	2.07	3.1	1.47	2.585
Nitrogen, Nitrate, as NO3-N	mg/L	<0.10	0.27	3.1	1.47	1.685
Phosphorus, Total						
Phosphorus, as P	mg/L	0.35	1.62	0.17	0.21	0.666667
Total Dissolved Solids						
Total Dissolved Solids	mg/L	256	296	412	256	321.3333
Total Kjeldahl Nitrogen						
Nitrogen, Kjeldahl, Total as N	mg/L	6.84	2.3	0.94	1.24	1.493333
Total Suspended Solids						
Total Suspended Solids	mg/L	52	12	4	4	6.666667
Volatiles by GC/MS Method 624						
1,1,1-Trichloroethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2-Trichloroethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichlorobenzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,3-Dichlorobenzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
1,4-Dichlorobenzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
2-Chloroethyl vinyl ether	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Acrolein	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Acrylonitrile	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Benzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	mg/L	<0.005	<0.005	0.011	<0.005	0.007
Bromoform	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Bromomethane	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Carbon tetrachloride	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorobenzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Chloroethane	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroform	mg/L	<0.005	<0.005	0.055	0.007	0.055
Chloromethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Cis-1,3-Dichloropropene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Dibromochloromethane	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Methylene chloride	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Tetrachloroethene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
trans-1,2-dichloroethene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005

	Units	2/17/2014	7/13/2015	9/26/2016	2/13/2017	Avg
Trans-1,3-Dichloropropene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Trichloroethene	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl chloride	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Cyanide, Total						
Cyanide, Total	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Oil and Grease by 1664A						
Oil and Grease	mg/L	1.8	<1.0	<1.0	2	1.333333
Phenolics, Total Recoverable						
Phenolics, Total Recoverable	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Mercury Low Level (Hg-Composite)						
Mercury, Low Level as Hg	ng/L	5.6	1.4	1.9	1.84	1.713333

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points: 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403); or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

E.1. Required Tests.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

✓ chronic ____ acute

E.2. Individual Test Data. Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

Test number: 1 Test number: 2 Test number: 3

a. Test information.

Test species & test method number	CeriodaphniaDubia/Pimephale	CeriodaphniaDubia/Pimephales	CeriodaphniaDubia/Pimephal
Age at initiation of test	<24 hrs	<24 hurs	<24 hrs
Outfall number	001	001	001
Dates sample collected	08/02/15	07/31/16	08/13/17
Date test started	08/04/15	08/02/16	08/15/17
Duration	Short term	Short term	Short term

b. Give toxicity test methods followed.

Manual title	Shortterm Methods for Estimating Chronic Toxicity of Effluents	Shortterm Methods for Estimating Chronic Toxicity of Effluents	Shortterm Methods for Estimating Chronic Toxicity of Effluents
Edition number and year of publication	Fourth Edition, 2002	Fourth Edition, 2002	Fourth Edition, 2002
Page number(s)	53, 141	53, 141	53, 141

c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.

24-Hour composite	X	X	X
Grab			

d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each)

Before disinfection			
After disinfection			
After dechlorination	X	X	X

FACILITY NAME AND PERMIT NUMBER: Oxford Tull C. Allen WWTP AL 000058408			*Form Approved 1/14/99 OMB Number 2040-0086*
	Test number:_____	Test number:_____	Test number:_____
e. Describe the point in the treatment process at which the sample was collected.			
Sample was collected:	After dechlorination	After dechlorination	After dechlorination
f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both.			
Chronic toxicity	x	X	X
Acute toxicity			
g. Provide the type of test performed.			
Static			
Static-renewal	X	X	X
Flow-through			
h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source.			
Laboratory water	X	X	X
Receiving water			
i. Type of dilution water. It salt water, specify "natural" or type of artificial sea salts or brine used.			
Fresh water	X	X	X
Salt water			
j. Give the percentage effluent used for all concentrations in the test series.			
	14%	14%	14%
	14%	14%	14%
	14%	14%	14%
k. Parameters measured during the test. (State whether parameter meets test method specifications)			
pH	7.7 SU	7.8 SU	8.1 SU
Salinity			
Temperature	25.0 C	25.3 C	25.3 C
Ammonia	0.18 mg/L	0.62 mg/L	0.05 mg/L
Dissolved oxygen	8.1 mg/L	8.1 mg/L	8.2 mg/L
l. Test Results.			
Acute:			
Percent survival in 100% effluent	%	%	%
LC_{50}			
95% C.I.	%	%	%
Control percent survival	%	%	%
Other (describe)			

Chronic:			
NOEC	Pp-500/Cd-125 %	Pp-500/Cd-125 %	Pp-500/Cd-125 %
IC_{25}	Pp-612/Cd-148 %	Pp-689/Cd-159 %	Pp-783/Cd-157 %
Control percent survival	Pp-96.7/Cd-100 %	Pp-100/Cd-100 %	Pp-100/Cd-100 %
Other (describe)			

m. Quality Control/Quality Assurance.

Is reference toxicant data available?	Yes	Yes	Yes
Was reference toxicant test within acceptable bounds?	Yes	Yes	Yes
What date was reference toxicant test run (MM/DD/YYYY)?	07/21/15-07/28/15	07/12/16-07/19/16	07/11/17-07/18/17
Other (describe)			

E.3. Toxicity Reduction Evaluation. Is the treatment works involved in a Toxicity Reduction Evaluation?

____Yes ✓ No If yes, describe: _____

_____

_____

E.4. Summary of Submitted Biomonitoring Test Information. If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: _____ (MM/DD/YYYY)

Summary of results: (see instructions)

_____

_____

END OF PART E.

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ✓ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 7.00

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Aerospace Coatings International, LLC

Mailing Address: 370 Knight Drive
Oxford, AL 36203

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Metal finishing and electroplating

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

714.00 gpd (____continuous or ✓ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (____continuous or ____intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ✓ Yes ____No

b. Categorical pretreatment standards ____Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ✓ No If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓ No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓ No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:
Oxford Tull C. Allen WWTP AL 000058408

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. **Pretreatment Program.** Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ✓ No

F.2. **Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs).** Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 7.00

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. **Significant Industrial User Information.** Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: AlaPlate LLC

Mailing Address: 2030 Barry Street
Oxford, AL 36203

F.4. **Industrial Processes.** Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Metal finishing and electroplating

F.5. **Principal Product(s) and Raw Material(s).** Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. **Flow Rate.**

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

20,000.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. **Pretreatment Standards.** Indicate whether the SIU is subject to the following:

a. Local limits ✓ Yes ____ No

b. Categorical pretreatment standards ____ Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ✓ No If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓ No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓ No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ✓ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Honeywell Aerospance Services

Mailing Address: 1 Cliff Garrett Drive
Anniston, AL 36202

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Aircraft parts cleaning and repair

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

60,000.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ____Yes ✓ No

b. Categorical pretreatment standards ____Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes____No If yes, describe each episode.

_____

_____

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

_____

_____

_____

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

_____

_____

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

_____

_____

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

_____

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ✓ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Kronospan LLC

Mailing Address: 9320 Highway 202
Eastaboga, AL 36260

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Manufacture of Medium Density Fiberboard

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): Fiberboard

Raw material(s): Wood chips

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

220,000.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ____Yes ✓ No

b. Categorical pretreatment standards ____Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes____No If yes, describe each episode.

_____

_____

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

_____

_____

_____

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

_____

_____

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

_____

_____

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

_____

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

✓ Yes ___ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 7.00

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Southern Metal

Mailing Address: PO Box 3327
Oxford, AL 36203

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Cleans filters and related parts and equipment for the manmade fiber industry

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

4,000.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ✓ Yes ___ No

b. Categorical pretreatment standards ___ Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ✓ No If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓ No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓ No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

___Yes ✓ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Southern Tool, Inc.

Mailing Address: PO Box 2248
Anniston, AL 36202

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Investment castings and metal finishing operations

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

1,157.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ___Yes ✓ No

b. Categorical pretreatment standards ___Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes____No If yes, describe each episode.

_____

_____

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

_____

_____

_____

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

_____

_____

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

_____

_____

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

_____

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ✓ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 7.00

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Tapecraft Corporation

Mailing Address: PO Box 2027
Anniston, AL 36202

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Textile Finishing and dyeing operations

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): _____

Raw material(s): _____

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

90,000.00 gpd (✓ continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ✓ Yes ___ No

b. Categorical pretreatment standards ___ Yes ✓ No

If subject to categorical pretreatment standards, which category and subcategory?

_____

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ✓ No If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓ No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓ No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Additional information, if provided, will appear on the following pages.

Please print or type in the unshaded areas only.

EPA ID Number (*copy from Item 1 of Form 1*)
AL0058408

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

FORM 2F NPDES

EPA

U.S. Environmental Protection Agency
Washington, DC 20460

Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (*list*)	B. Latitude			C. Longitude			D. Receiving Water (*name*)
001	33	35	02	85	54	19	Choccolocco Creek
002	33	34	59	85	54	30	Choccolocco Creek

RECEIVED
MAR 02 2018
IND / MUN BRANCH

II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

1. Identification of Conditions, Agreements, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	number	source of discharge		a. req.	b. proj.

B: You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfalls(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage of disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which received storm water discharges from the facility.

Continued from the Front

IV. Narrative Description of Pollutant Sources

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall Number	Area of Impervious Surface *(provide units)*	Total Area Drained *(provide units)*	Outfall Number	Area of Impervious Surface *(provide units)*	Total Area Drained *(provide units)*
001-1	15,306 sq feet	125,477 sq ft	002	16,893 sq feet	245,825 sq ft

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact by these materials with storm water runoff; materials loading and access areas, and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

Municipal wastewater treatment process in drying beds and holding ponds could possibly overflow due to simultaneous equipment failure and heavy rain event. Equipment is checked and maintained periodically. Weather forecasts are monitored to anticipate rain events and prepare accordingly.

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Treatment	List Codes from Table 2F-1
001, 002	Storm water contaminants are addressed by the following control meaures: Two 250--gallon capacity ASTs used to store diesel fuel are utilized on site. The single-walled ASTs are located within concrete secondary containment between the maintenance building and the blower building. The stormwater is not treated.	5A, 5C, 5H

V. Nonstormwater Discharges

A. I certify under penalty of law hat the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharged from these outfall(s) are identified in either an accompanying Form 2C or From 2E application for the outfall.

Name and Official Title *(type or print)*	Signature	Date Signed
Wayne Livingston, General Manager		

B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

Grab samples were collected at two drainage locations (outfall 1 and outfall 2 as shown on the attached map) during large rain events on 07/13/2015, 9/26/2016, and 2/13/2017.

VI. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

None.

EPA ID Number *(copy from Item 1 of Form 1)*
AL0058408

VII. Discharge Information

A, B, C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Table VII-A, VII-B, VII-C are included on separate sheets numbers VII-1 and VII-2.

E. Potential discharges not covered by analysis – is any toxic pollutant listed in table 2F-2, 2F-3, or 2F-4, a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes (*list all such pollutants below*) ☑ No (*go to Section IX*)

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ Yes (*list all such pollutants below*) ☑ No (*go to Section IX*)

IX. Contract Analysis Information

Were any of the analyses reported in Item VII performed by a contract laboratory or consulting firm?

☐ Yes (*list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below*) ☑ No (*go to Section X*)

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed

X. Certification

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.

A. Name & Official Title (*Type Or Print*)	B. Area Code and Phone No.
Wayne Livingston, General Manager	(256) 831-5618
C. Signature	D. Date Signed
Wayne Livingston	2/28/18

EPA ID Number (*copy from Item 1 of Form 1*)
AL0058408

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (*if available*)	Maximum Values (*include units*)		Average Values (*include units*)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Oil and Grease	3.7 mg/l	N/A	3.7 mg/l	N/A	1	Wastewater Treatment Plant runoff
Biological Oxygen Demand (BOD5)	3.1 mg/l	2.9 mg/l	3.1 mg/l	2.9 mg/l	1	Wastewater Treatment Plant runoff
Chemical Oxygen Demand (COD)	28.2 mg/l	19.4 mg/l	28.2 mg/l	19.4 mg/l	1	Wastewater Treatment Plant runoff
Total Suspended Solids (TSS)	180 mg/l	163 mg/l	180 mg/l	163 mg/l	1	Wastewater Treatment Plant runoff
Total Nitrogen	1.46 mg/l	1.13 mg/l	1.46 mg/l	1.13 mg/l	1	Wastewater Treatment Plant runoff
Total Phosphorus	0.34 mg/l	0.26 mg/l	0.34 mg/l	0.26 mg/l	1	Wastewater Treatment Plant runoff
pH	Minimum 7.76	Maximum 7.76	Minimum 7.76	Maximum 7.76	1	Wastewater Treatment Plant runoff

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

Pollutant and CAS Number (*if available*)	Maximum Values (*include units*)		Average Values (*include units*)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Cadmium, as Cd	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	1	Wastewater Treatment Plant runoff
Lead, as Pb	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	1	Wastewater Treatment Plant runoff
Cyanide, Total	<0.010 mg/l	<0.010 mg/l	<0.010 mg/l	<0.010 mg/l	1	Wastewater Treatment Plant runoff
CBOD, 5 day	3.6 mg/l	2.8 mg/l	3.6 mg/l	2.8 mg/l	1	Wastewater Treatment Plant runoff
Ammonia, as N	0.14 mg/l	0.13 mg/l	0.14 mg/l	0.13 mg/l	1	Wastewater Treatment Plant runoff
Nitrite, as NO2	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	1	Wastewater Treatment Plant runoff
Total NO2-NO3	0.34 mg/l	0.3 mg/l	0.34 mg/l	0.3 mg/l	1	Wastewater Treatment Plant runoff
Nitrate, as NO3	0.34 mg/l	0.3 mg/l	0.34 mg/l	0.3 mg/l	1	Wastewater Treatment Plant runoff
Total Kjeldahl	1.12 mg/l	0.83 mg/l	1.12 mg/l	0.83 mg/l	1	Wastewater Treatment Plant runoff
Color, ADMI	23 Units	22 Units	23 Units	22 Units	1	Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff

Continue on Reverse

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		

Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event *(in minutes)*	3. Total rainfall during storm event *(in inches)*	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event *(gallons/minute or specify units)*	6. Total flow from rain event *(gallons or specify units)*
08/28/2012	Unknown	0.52 inches	Unknown	Unknown	Unknown

7. Provide a description of the method of flow measurement or estimate.

Volume collected over the period of time would be used to estimate total flow.

EPA ID Number (*copy from Item 1 of Form 1*)
AL0058408

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Oil and Grease	1.2 mg/l	N/A	1.2 mg/l	N/A	1	Wastewater Treatment Plant runoff
Biological Oxygen Demand (BOD5)	<2.0 mg/l	2.5 mg/l	<2.0 mg/l	2.5 mg/l	1	Wastewater Treatment Plant runoff
Chemical Oxygen Demand (COD)	45.8 mg/l	19.4 mg/l	45.8 mg/l	19.4 mg/l	1	Wastewater Treatment Plant runoff
Total Suspended Solids (TSS)	398 mg/l	132 mg/l	398 mg/l	132 mg/l	1	Wastewater Treatment Plant runoff
Total Nitrogen	1.38 mg/l	0.49 mg/l	1.38 mg/l	0.49 mg/l	1	Wastewater Treatment Plant runoff
Total Phosphorus	0.34 mg/l	0.15 mg/l	0.34 mg/l	0.15 mg/l	1	Wastewater Treatment Plant runoff
pH	Minimum 6.31	Maximum 6.31	Minimum 6.31	Maximum 6.31	1	Wastewater Treatment Plant runoff

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Cadmium, as Cd	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	1	Wastewater Treatment Plant runoff
Lead, as Pb	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	1	Wastewater Treatment Plant runoff
Cyanide, Total	<0.010 mg/l	<0.010 mg/l	<0.010 mg/l	<0.010 mg/l	1	Wastewater Treatment Plant runoff
CBOD, 5 day	<2.0 mg/l	2.1 mg/l	<2.0 mg/l	2.1 mg/l	1	Wastewater Treatment Plant runoff
Ammonia, as N	0.1 mg/l	0.08 mg/l	0.1 mg/l	0.08 mg/l	1	Wastewater Treatment Plant runoff
Nitrite, as NO2	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	1	Wastewater Treatment Plant runoff
Total NO2-NO3	0.18 mg/l	0.17 mg/l	0.18 mg/l	0.17 mg/l	1	Wastewater Treatment Plant runoff
Nitrate, as NO3	0.18 mg/l	0.17 mg/l	0.18 mg/l	0.17 mg/l	1	Wastewater Treatment Plant runoff
Total Kjeldahl	1.2 mg/l	0.32 mg/l	1.2 mg/l	0.32 mg/l	1	Wastewater Treatment Plant runoff
Color, ADMI	18 Units	18 Units	18 Units	18 Units	1	Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff
						Wastewater Treatment Plant runoff

Continue on Reverse

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		

Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event *(in minutes)*	3. Total rainfall during storm event *(in inches)*	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event *(gallons/minute or specify units)*	6. Total flow from rain event *(gallons or specify units)*
08/28/2012	Unknown	0.52 inches	Unknown	Unknown	Unknown

7. Provide a description of the method of flow measurement or estimate.

Volume collected over the period of time would be used to estimate total flow.


630
620
610
600
590
580
570
570
TOTE STORAGE
PAVED SURFACE
PAVED SURFACE
PAVED SURFACE
ROLL OFF STORAGE
DEWATERING AREA
POLYMER BUILDING
OFFICE
MAINTENANCE BUILDING
OUTFALL 1
CONTAINMENT CONTROL MEASURES
250-GAL DIESEL
CONTAINMENT CONTROL MEASURES
BLOWER BUILDING
CHLORINE BUILDING
~250-GAL EMPTY
OUTFALL 2
SILVER RUN RECOUNTY RD 471

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (ADEM)
NPDES INDIVIDUAL PERMIT APPLICATION
SUPPLEMENTARY INFORMATION FOR PUBLICLY-OWNED TREATMENT WORKS (POTW), OTHER TREATMENT WORKS TREATING DOMESTIC SEWAGE (TWTDS), AND PUBLIC WATER SUPPLY TREATMENT PLANTS

Instructions: This form should be used to submit the required supplementary information for an application for an NPDES individual permit for Publicly Owned Treatment Works (POTW) and other Treatment Works Treating Domestic Sewage (TWTDS). The completed application should be submitted to ADEM in duplicate. If insufficient space is available to address any item, please continue on an attached sheet of paper. Please mark "N/A" in the appropriate box when an item is not applicable to the applicant. **Please type or print legibly in blue or black ink.** Mail the completed application to:

ADEM-Water Division
Municipal Section
P O Box 301463
Montgomery, AL 36130-1463

RECEIVED
APR 17 2019
IND. MUN BRANCH

PURPOSE OF THIS APPLICATION

- ☐ Initial Permit Application for New Facility*
- ☐ Modification of Existing Permit
- ☐ Revocation & Reissuance of Existing Permit
- ☐ Initial Permit Application for Existing Facility*
- ■ Reissuance of Existing Permit

* *An application for participation in the ADEM's Electronic Environmental (E2) Reporting must be submitted to allow permittee to electronically submit reports as required.*

SECTION A – GENERAL INFORMATION

1. Facility Name: Tull C. Allen Wastewater Treatment Plant

   a. Operator Name: Water Works & Sewer Board of the City of Oxford

   b. Is the operator identified in A.1.a, the owner of the facility? ■ Yes ☐ No
   If no, provide name and address of the operator and submit information indicating the operator's scope of responsibility for the facility.

   c. Name of Permittee* if different than Operator:
   **Permittee will be responsible for compliance with the conditions of the permit*

2. NPDES Permit Number: AL 0058408 (Not applicable if initial permit application)

3. Facility Physical Location: (**Attach a map with location marked; street, route no. or other specific identifier**)
   Street: 2975 Silver Run Road
   City: Oxford County: Talladega State: AL Zip: 36203
   Facility Location (Front Gate): Latitude: 33d35'2.981"N Longitude: 85d54'21.327"W

4. Facility Mailing Address: PO Box 3663
   City: Oxford County: Calhoun State: AL Zip: 36203

5. Responsible Official (as described on last page of this application):
   Name and Title: Wayne Livingston, General Manager
   Address: 600 Barry Street, PO Box 3663
   City: Oxford State: AL Zip: 36203
   Phone Number: 256-831-5618 Email Address: wlivingston@oxfordwater.com

6. Designated Facility/DMR Contact:

Name and Title: Meredith Holzer, Engineer

Phone Number: 256-831-5618 Email Address: mholzer@oxfordwater.com

7. Designated Emergency Contact:

Name and Title: Wayne Livingston, General Manager

Phone Number: 256-831-5618 Email Address: wlivingston@oxfordwater.com

8. Please complete this section if the Applicant's business entity is a Proprietorship or Limited Liability Company (LLC) with a responsible official not listed in A.5.

Name and Title: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ Email Address: _____

9. Permit numbers for Applicant's previously issued NPDES Permits and identification of any other State Environmental Permits presently held by the Applicant within the State of Alabama:

Permit Type	Permit Number	Held By
NPDES Permit	AL 0058408	Oxford Water Works & Sewer Board
NPDES Stormwater Permit		Oxford Water Works & Sewer Board
Water Supply Permit	PW AL 0000162	Oxford Water Works & Sewer Board

10. Identify all Administrative Complaints, Notices of Violation, Directives, or Administrative Orders, Consent Decrees, or Litigation concerning water pollution or other permit violations, if any against the Applicant within the State of Alabama in the past five years (attach additional sheets if necessary):

Facility Name	Permit Number	Type of Action	Date of Action
Tull C. Allen WWTP	AL0058408	Unilateral Order	07/2013
Tull C. Allen WWTP	AL0058408	Administrative Order	02/2019

SECTION B – WASTEWATER DISCHARGE INFORMATION

1. List the following historical monthly flow rates recorded for the past five years for each outfall:

Outfall No.	Highest Flow in Last 12 Months (MGD)	Highest Daily Flow (MGD)	Average Flow (MGD)
001	8.79	10.755	4.004

2. Attach a process flow schematic of the treatment process, including the size of each unit operation and sample collection locations.

3. Do you share an outfall with another facility? ☐ Yes ☒ No (If no, continue to B.4)
For each shared outfall, provide the following:

Applicant's Outfall No.	Name of Other Permittee/Facility	NPDES Permit No.	Where is sample collected by Applicant?

4. Do you have, or plan to have, automatic sampling equipment or continuous wastewater flow metering equipment at this facility?

Current:	Flow Metering	☒ Yes	☐ No	☐ N/A
	Sampling Equipment	☐ Yes	☒ No	☐ N/A
Planned:	Flow Metering	☐ Yes	☐ No	☒ N/A
	Sampling Equipment	☐ Yes	☒ No	☐ N/A

If so, please attach a schematic diagram of the sewer system indicating the present or future location of this equipment and describe the equipment below:

5. Are any wastewater collection or treatment modifications or expansions planned during the next three years that could alter wastewater volumes or characteristics (Note: Permit Modification may be required)? ☐ Yes ☒ No

Briefly describe these changes and any potential or anticipated effects on the wastewater quality and quantity: (Attach additional sheets if needed.)

SECTION C – WASTE STORAGE AND DISPOSAL INFORMATION

Describe the location of all sites used for the storage of solids or liquids that have any potential for accidental discharge to a water of the state, either directly or indirectly via storm sewer, municipal sewer, municipal wastewater treatment plants, or other collection or distribution systems that are located at or operated by the subject existing or proposed NPDES- permitted facility. Indicate the location of any potential release areas and provide a map or detailed narrative description of the areas of concern as an attachment to this application:

Description of Waste	Description of Storage Location
Sewage Sludge	Plastic media drying beds, screen lined filter cans

Describe the location of any sites used for the ultimate disposal of solid or liquid waste materials or residuals (e.g. sludges) generated by any wastewater treatment system located at the facility.

Description of Waste	Quantity (lbs/day)	Disposal Method*
Dried sewage sludge	20,600	Off-site landfill

***Indicate any wastes disposed at an off-site treatment facility and any wastes that are disposed on-site**

SECTION D – INDUSTRIAL INDIRECT DISCHARGE CONTRIBUTORS

a. List the existing and proposed industrial source wastewater contributions to the municipal wastewater treatment system (Attach other sheets if necessary)

Company Name	Description of Industrial Wastewater	Existing or Proposed	Flow (MGD)	Subject to SID Permit?	
Honeywell	Industrial wastewater from parts cleaning	Existing	0.0600	■ Yes	☐ No
Southern Metal	Discharge from parts & equipment from fiber industry	Existing	0.0040	■ Yes	☐ No
Southern Tool	Industrial waste from investment castings	Existing	0.0012	■ Yes	☐ No
Tapecraft	Industrial waste from textile finishing and dyeing	Existing	0.0900	■ Yes	☐ No

b. Are industrial wastewater contributions regulated via a locally approved sewer use ordinance? ■ Yes ☐ No
If yes, please attach a copy of the ordinance.

SECTION E – COASTAL ZONE INFORMATION

Is the discharge(s) located within the 10-foot elevation contour and within the limits of Mobile or Baldwin County? ☐ Yes ■ No
If yes, complete items E.1 – E.12 below:

		Yes	No
1.	Does the project require new construction?	☐	☐
2.	Will the project be a source of new air emissions?	☐	☐
3.	Does the project involve dredging and/or filling of a wetland area or water way?	☐	☐
	If Yes, has the Corps of Engineers (COE) permit been received?	☐	☐
	COE Project No. _____		
4.	Does the project involve wetlands and/or submersed grassbeds?	☐	☐
5.	Are oyster reefs located near the project site?	☐	☐
	If Yes, include a map showing project and discharge location with respect to oyster reefs		
6.	Does the project involve the site developement, construction and operation of an energy facility as defined in ADEM Admin. Code r. 335-8-1-.02(bb)?	☐	☐
7.	Does the project involve mitigation of shoreline or coastal area erosion?	☐	☐
8.	Does the project involve construction on beaches or dune areas?	☐	☐
9.	Will the project interfere with public access to coastal waters?	☐	☐
10.	Does the project lie within the 100-year floodplain?	☐	☐
11.	Does the project involve the registration, sale, use, or application of pesticides?	☐	☐
12.	Does the project propose or require construction of a new well or to alter an existing groundwater well to pump more than 50 gallons per day (GPD)?	☐	☐
	If yes, has the applicable permit for groundwater recovery or for groundwater well installation been obtained?	☐	☐

SECTION F – ANTI-DEGRADATION EVALUATION

In accordance with 40 CFR §131.12 and the ADEM Admin. Code r. 335-6-10-.04 for anti-degradation, the following information must be provided, if applicable. It is the applicant's responsibility to demonstrate the social and economic importance of the proposed activity. If further information is required to make this demonstration, attach additional sheets to the application.

1. Is this a new or increased discharge that began after April 3, 1991? ☐ Yes ☒ No
   If yes, complete F.2 below. If no, go to Section G.

2. Has an Anti-Degradation Analysis been previously conducted and submitted to the Department for the new or increased discharge referenced in F.1? ☐ Yes ☒ No

   If yes, do not complete this section.

   If no and the discharge is to a Tier II waterbody as defined in ADEM Admin. Code r. 335-6-10-.12(4), complete F.2.A – F.2.F below, ADEM Form 311-Alternatives Analysis, and either ADEM Form 312 or ADEM Form 313- Calculation of Total Annualized Project Costs (Public-Sector or Private-Sector Projects, whichever is applicable). ADEM Form 312 or ADEM Form 313, whichever is applicable, must be provided for **each** treatment discharge alternative considered technically viable. ADEM forms can be found on the Department's website at http://adem.alabama.gov/DeptForms/.

   Information required for new or increased discharges to high quality waters:

   A. What environmental or public health problem will the discharger be correcting?

   _____

   B. How much will the discharger be increasing employment (at its existing facility or as the result of locating a new facility)?

   _____

   C. How much reduction in employment will the discharger be avoiding?

   _____

   D. How much additional state or local taxes will the discharger be paying?

   _____

   E. What public service to the community will the discharger be providing?

   _____

   F. What economic or social benefit will the discharger be providing to the community?

   _____

SECTION G – EPA Application Forms

All Applicants must submit certain EPA permit application forms. More than one application form may be required from a POTW or other TWTDS depending on the number and types of discharges or outfalls. The EPA application forms are found on the Department's website at http://adem.alabama.gov/programs/water/waterforms.cnt. The EPA application forms must be submitted in duplicate as follows:

1. All applicants must submit Form 1.
2. Applicants for new or existing discharges of sanitary wastewater from Publicly-Owned Treatment Works (POTW) and Other Treatment Works Treating Domestic Sewage (TWTDS) must submit Form 2A.
3. Applicants for new or existing land application of sanitary wastewater must submit Form 2A and, if the land application site is not completely bermed to prevent runoff, applicants must also submit Form 2F.
4. Applicants for new and existing discharges of process wastewater from water treatment facilities (i.e. public water supply treatment plants) must submit Form 2C.
5. Applicants that generate sewage sludge, derive a material from sewage sludge, or dispose of sewage sludge must submit Part 2 of Form 2S.

SECTION H– ENGINEERING REPORT/BMP PLAN REQUIREMENTS

Any Engineering Report or Best Management Practice (BMP) Plans required to be submitted to ADEM by the applicant must be in accordance with ADEM 335-6-6-.08(i) & (j).

SECTION I– RECEIVING WATERS

Outfall No.	Receiving Water(s)	303(d) Segment?	Included in TMDL?*
001	Choccolocco Creek	■ Yes ☐ No	☐ Yes ■ No
		☐ Yes ☐ No	☐ Yes ☐ No
		☐ Yes ☐ No	☐ Yes ☐ No

*If a TMDL Compliance Schedule is requested, the following should be attached as supporting documentation:

(1) Justification for the requested Compliance Schedule (e.g. time for design and installation of control equipment, etc.);

(2) Monitoring results for the pollutant(s) of concern which have not previously been submitted to the Department (sample collection dates, analytical results (mass and concentration), methods utilized, MDL/ML, etc. should be submitted as available);

(3) Requested interim limitations, if applicable;

(4) Date of final compliance with the TMDL limitations; and,

(5) Any other additional information available to support requested compliance schedule.

SECTION J – APPLICATION CERTIFICATION

The information contained in this form must be certified by a responsible official as defined in ADEM Administrative Code r. 335-6-6-.09 "signatories to permit applications and reports" (see below).

"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."

Signature of Responsible Official: Wayne Livingston Date Signed: 3-6-19

Name and Title: Wayne Livingston, General Manager

If the Responsible Official signing this application is not identified in Section A.5 or A.8, provide the following information:

Mailing Address: PO Box 3663, Oxford, AL 36203

City: Oxford State: AL Zip: 36203

Phone Number: 256-831-5618 Email Address: wlivingston@oxfordwater.com

335-6-6-.09 SIGNATORIES TO PERMIT APPLICATIONS AND REPORTS.

(1) The application for an NPDES permit shall be signed by a responsible official, as indicated below:

(a) In the case of a corporation, by a principal executive officer of at least the level of vice president, or a manager assigned or delegated in accordance with corporate procedures, with such delegation submitted in writing if required by the Department, who is responsible for manufacturing, production, or operating facilities and is authorized to make management decisions which govern the operation of the regulated facility;

(b) In the case of a partnership, by a general partner;

(c) In the case of a sole proprietorship, by the proprietor; or

(d) In the case of a municipal, state, federal, or other public entity, by either a principal executive officer, or ranking elected official.

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

PART 1: LIMITED BACKGROUND INFORMATION

This part should be completed only by "sludge-only" facilities - that is, facilities that do not currently have, and are not applying for, an NPDES permit for a direct discharge to a surface body of water.

For purposes of this form, the term "you" refers to the applicant. "This facility" and "your facility" refer to the facility for which application information is submitted.

1. **Facility Information.**

   a. Facility name: Tull C. Allen Wastewater Treatment Plant

   b. Mailing Address: PO Box 3663, Oxford, AL 36203

   c. Contact person: Wayne Livingston
   Title: General Manager
   Telephone number: (256) 831-5618

   d. Facility Address (not P.O. B ox): 2975 Silver Run Road
   Oxford, AL 36203

   e. Indicate the type of facility

   ✓ Publicly owned treatment works (POTW) ____ Privately owned treatment works

   ____ Federally owned treatment works ____ Blending or treatment operation

   ____ Surface disposal site ____ Sewage sludge incinerator

   ____ Other (describe) ____

2. **Applicant Information.**

   a. Applicant name: Water Works & Sewer Board of the City of Oxford

   b. Mailing Address: 600 Barry Street, PO Box 3663, Oxford, AL 36203

   c. Contact person: Wayne Livingston
   Title: General Manager
   Telephone number: (256) 831-5618

   d. Is the applicant the owner or operator (or both) of this facility?

   ✓ owner ✓ operator

   e. Should correspondence regarding this permit be directed to the facility or the applicant?

   ____ facility ✓ applicant

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

3. **Sewage Sludge Amount.** Provide the total dry metric tons per latest 365 day period of sewage sludge handled under the following practices:

a. Amount generated at the facility 3,372.60 dry metric tons
b. Amount received from off site _____ dry metric tons
c. Amount treated or blended on site _____ dry metric tons
d. Amount sold or given away in a bag or other container for application to the land _____ dry metric tons
e. Amount of bulk sewage sludge shipped off site for treatment or blending _____ dry metric tons
f. Amount applied to the land in bulk form _____ dry metric tons
g. Amount placed on a surface disposal site _____ dry metric tons
h. Amount fired in a sewage sludge incinerator _____ dry metric tons
i. Amount sent to a municipal solid waste landfill _____ dry metric tons
j. Amount used or disposed by another practice _____ dry metric tons
Describe _____

4. **Pollutant Concentrations.** Using the table below or a separate attachment, provide existing sewage sludge monitoring data for the pollutants for which limits in sewage sludge have been established in 40 CFR part 503 for this facility's expected use or disposal practices. If available, base data on three or more samples taken at least one month apart and no more than four and one-half years old.

POLLUTANT	CONCENTRATION (mg/kg dry weight)	ANALYTICAL METHOD	DETECTION LEVEL FOR ANALYSIS
ARSENIC	0.00	SW6010B	3.59
CADMIUM	0.00	SW6010B	.36
CHROMIUM	112.75	SW6010B	3.59
COPPER	197.00	SW6010B	3.59
LEAD	0.00	SW6010B	1.79
MERCURY	0.00	SW7471A	.342
MOLYBDENUM	0.00	SW6010B	17.9
NICKEL	42.24	SW6010B	17.9
SELENIUM	0.00	SW6010B	3.59
ZINC	373.00	SW6010B	17.9

5. **Treatment Provided At Your Facility.**

a. Which class of pathogen reduction does the sewage sludge meet at your facility?

_____ Class A _____ Class B ✓ Neither or unknown

b. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce pathogens in sewage sludge:

c. Which vector attraction reduction option is met for the sewage sludge at your facility?

_____ Option 1 (Minimum 38 percent reduction in volatile solids)
_____ Option 2 (Anaerobic process, with bench-scale demonstration)
_____ Option 3 (Aerobic process, with bench-scale demonstration)
_____ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
_____ Option 5 (Aerobic processes plus raised temperature)
_____ Option 6 (Raise pH to 12 and retain at 11.5)
_____ Option 7 (75 percent solids with no unstabilized solids)
_____ Option 8 (90 percent solids with unstabilized solids)
_____ Option 9 (Injection below land surface)
_____ Option 10 (Incorporation into soil within 6 hours)
_____ Option 11 (Covering active sewage sludge unit daily)
✓ None or unknown

d. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce vector attraction properties of sewage sludge:

_____

_____

6. **Sewage Sludge Sent to Other Facilities.** Does the sewage sludge from your facility meet the Table 1 ceiling concentrations, the Table 3 pollutant concentrations, Class A pathogen requirements, and one of the vector attraction options 1-8?
_____ Yes ✓ No

If yes, go to question 8 (Certification).

If no, is sewage sludge from your facility provided to another facility for treatment, distribution, use, or disposal?
✓ Yes _____ No

If no, go to question 7 (Use and Disposal Sites).

If yes, provide the following information for the facility receiving the sewage sludge:

a. Facility name: ADVANCED DISPOSAL CEDAR HILL LANDFILL

b. Mailing address: 1319 NO BUSINESS CREEK RD. RAGLAND, AL 35131

c. Contact person: MARK DAVIS

Title: _____

Telephone number: _____

d. Which activities does the receiving facility provide? (Check all that apply)

_____ Treatment or blending
_____ Land application
_____ Incineration
_____ Sale or give-away in bag or other container
_____ Surface disposal
✓ Other (describe):

Landfill

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

7. Use and Disposal Sites. Provide the following information for each site on which sewage sludge from this facility is used or disposed:

a. Site name or number: ADVANCED DISPOSAL CEDAR HILL LANDFILL

b. Contact person: MARK DAVIS

Title: _____

Telephone: _____

c. Site location (Complete 1 or 2)

1. Street or Route #: 1319 NO BUSINESS CREEK RD

County: _____

City or Town: RAGLAND State: AL Zip: 35131

2. Latitude: _____ Longitude: _____

d. Site type (Check all that apply)

____ Agricultural ____ Lawn or home garden ____ Forest
____ Surface disposal ____ Public Contact ____ Incineration
____ Reclamation ✓ Municipal Solid Waste Landfill ____ Other (describe): _____

8. Certification. Sign the certification statement below. (Refer to instructions to determine who is an officer for purposes of this certification.)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with the 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 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.

Name and official title: Wayne Livingston, General Manager

Signature: Wayne Livingston

Telephone number: (256) 831-5618

Date signed: 03/05/2019

SEND COMPLETED FORMS TO:

Form Approved 1/14/99
OMB Number 2040-0086

PART 2: PERMIT APPLICATION INFORMATION

Complete this part if you have an effective NPDES permit or have been directed by the permitting authority to submit a full permit application at this time. In other words, complete this part if your facility has, or is applying for, an NPDES permit.

For purposes of this form, the term "you" refers to the applicant. "This facility" and "your facility" refer to the facility for which application information is submitted.

APPLICATION OVERVIEW — SEWAGE SLUDGE USE OR DISPOSAL INFORMATION

Part 2 is divided into five sections (A-E). Section A pertains to all applicants. The applicability of Sections B, C, D, and E depends on your facility's sewage sludge use or disposal practices. The information provided on this page indicates which sections of Part 2 to fill out.

1. **SECTION A: GENERAL INFORMATION.**

   Section A must be completed by all applicants

2. **SECTION B: GENERATION OF SEWAGE SLUDGE OR PREPARATION OF A MATERIAL DERIVED FROM SEWAGE SLUDGE.**

   Section B must be completed by applicants who either:

   1) Generate sewage sludge, or

   2) Derive a material from sewage sludge.

3. **SECTION C: LAND APPLICATION OF BULK SEWAGE SLUDGE.**

   Section C must be completed by applicants who either:

   1) Apply sewage to the land, or

   2) Generate sewage sludge which is applied to the land by others.

   NOTE: Applicants who meet either or both of the two above criteria are exempted from this requirement if <u>all</u> sewage sludge from their facility falls into one of the following three categories:

   1) The sewage sludge from this facility meets the ceiling and pollutant concentrations, Class A pathogen reduction requirements, and one of vector attraction reduction options 1-8, as identified in the instructions, or
   2) The sewage sludge from this facility is placed in a bag or other container for sale or give-away for application to the land, or
   3) The sewage sludge from this facility is sent to another facility for treatment or blending.

4. **SECTION D: SURFACE DISPOSAL**

   Section D must be completed by applicants who own or operate a surface disposal site.

5. **SECTION E: INCINERATION**

   Section E must be completed by applicants who own or operate a sewage sludge incinerator.

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

A. GENERAL INFORMATION

All applicants must complete this section.

A.1. Facility Information.

a. Facility name: Tull C. Allen Wastewater Treatment Plant

b. Mailing Address: PO Box 3663, Oxford, AL 36203

c. Contact person: Wayne Livingston
Title: General Manager
Telephone number: (256) 831-5618

d. Facility Address (not P.O. Box): 2975 Silver Run Road, Oxford, AL 36203

e. Is this facility a Class I sludge management facility? _____ Yes _____ No

f. Facility design flow rate: 4.50 mgd

g. Total population served: _____

h. Indicate the type of facility:

✓ Publicly owned treatment works (POTW) _____ Privately owned treatment works
_____ Federally owned treatment works _____ Blending or treatment operation
_____ Surface disposal site _____ Sewage sludge incinerator
_____ Other (describe) _____

A.2. Applicant Information. If the applicant is different from the above, provide the following:

a. Applicant name _____

b. Mailing Address _____

c. Contact person _____
Title _____
Telephone number _____

d. Is the applicant the owner or operator (or both) of this facility?

✓ owner ✓ operator

e. Should correspondence regarding this permit should be directed to the facility or the applicant.

_____ facility ✓ applicant

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

A.3. Permit Information.

a. Facility's NPDES permit number (if applicable): AL0058408

b. List, on this form or an attachment, all other Federal, State, and local permits or construction approvals received or applied for that regulate this facility's sewage sludge management practices:

Permit Number	Type of Permit

A.4. Indian Country. Does any generation, treatment, storage, application to land, or disposal of sewage sludge from this facility occur in Indian Country?

_____Yes ___✓___No If yes, describe: _____

A.5. Topographic Map. Provide a topographic map or maps (or other appropriate map(s) if a topographic map is unavailable) that show the following information. Map(s) should include the area one mile beyond all property boundaries of the facility:

a. Location of all sewage sludge management facilities, including locations where sewage sludge is stored, treated, or disposed.

b. Location of all wells, springs, and other surface water bodies, listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundaries.

A.6. Line Drawing. Provide a line drawing and/or a narrative description that identifies all sewage sludge processes that will be employed during the term of the permit, including all processes used for collecting, dewatering, storing, or treating sewage sludge, the destination(s) of all liquids and solids leaving each unit, and all methods used for pathogen reduction and vector attraction reduction.

A.7. Contractor Information.

Are any operational or maintenance aspects of this facility related to sewage sludge generation, treatment, use or disposal the responsibility of a contractor? _____Yes ___✓___No

If yes, provide the following for each contractor (attach additional pages if necessary):

a. Name _____

b. Mailing Address _____

c. Telephone Number _____

d. Responsibilities of contractor _____

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

A.8. Pollution Concentrations: Using the table below or a separate attachment, provide sewage sludge monitoring data for the pollutants for which limits in sewage sludge have been established in 40 CFR Part 503 for this facility's expected use or disposal practices. All data must be based on three or more samples taken at least one month apart and must be no more than four and one-half years old.

POLLUTANT	CONCENTRATION (mg/kg dry weight)	ANALYTICAL METHOD	DETECTION LEVEL FOR ANALYSIS
ARSENIC	0.00	SW6010B	3.59
CADMIUM	0.00	SW6010B	.36
CHROMIUM	112.75	SW6010B	3.59
COPPER	180.18	SW6010B	3.59
LEAD	0.00	SW6010B	1.79
MERCURY	0.00	SW7471A	.342
MOLYBDENUM	6.47	SW6010B	17.9
NICKEL	42.24	SW6010B	17.9
SELENIUM	0.00	SW6010B	3.59
ZINC	373.00	SW6010B	17.9

A.9. Certification. Read and submit the following certification statement with this application. Refer to the instructions to determine who is an officer for purposes of this certification. Indicate which parts of Form 2S you have completed and are submitting:

✓ Part 1 Limited Background Information packet

Part 2 Permit Application Information packet:

✓ Section A (General Information)
✓ Section B (Generation of Sewage Sludge or Preparation of a Material Derived from Sewage Sludge)
____ Section C (Land Application of Bulk Sewage Sludge)
____ Section D (Surface Disposal)
____ Section E (Incineration)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with the 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 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.

Name and official title: Wayne Livingston, General Manager

Signature: _____ Date signed: _____

Telephone number: (256) 831-5618

Upon request of the permitting authority, you must submit any other information necessary to assess sewage sludge use or disposal practices at your facility or identify appropriate permitting requirements.

SEND COMPLETED FORMS TO:

B. GENERATION OF SEWAGE SLUDGE OR PREPARATION OF A MATERIAL DERIVED FROM SEWAGE SLUDGE

Complete this section if your facility generates sewage sludge or derives a material from sewage sludge.

B.1. Amount Generated On Site.

Total dry metric tons per 365-day period generated at your facility: 3,372.60 dry metric tons

B.2. Amount Received from Off Site. If your facility receives sewage sludge from another facility for treatment, use, or disposal, provide the following information for each facility from which sewage sludge is received. If you receive sewage sludge from more than one facility, attach additional pages as necessary.

a. Facility name _____

b. Mailing Address _____

_____

c. Contact person _____

Title _____

Telephone number _____

d. Facility Address (not P.O. Box) _____

_____

e. Total dry metric tons per 365-day period received from this facility: _____ dry metric tons

f. Describe, on this form or on another sheet of paper, any treatment processes known to occur at the off-site facility, including blending activities and treatment to reduce pathogens or vector attraction characteristics.

_____

_____

B.3. Treatment Provided At Your Facility.

a. Which class of pathogen reduction is achieved for the sewage sludge at your facility?

_____ Class A _____ Class B ✓ Neither or unknown

b. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce pathogens in sewage sludge:

_____

_____

c. Which vector attraction reduction option is met for the sewage sludge at your facility?

_____ Option 1 (Minimum 38 percent reduction in volatile solids)
_____ Option 2 (Anaerobic process, with bench-scale demonstration)
_____ Option 3 (Aerobic process, with bench-scale demonstration)
_____ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
_____ Option 5 (Aerobic processes plus raised temperature)
_____ Option 6 (Raise pH to 12 and retain at 11.5)
_____ Option 7 (75 percent solids with no unstabilized solids)
_____ Option 8 (90 percent solids with unstabilized solids)
✓ None or unknown

B.3. Treatment Provided At Your Facility. (con't)

d. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce vector attraction properties of sewage sludge:

_____

_____

e. Describe, on this form or another sheet of paper, any other sewage sludge treatment or blending activities not identified in (a) - (d) above:

_____

_____

Complete Section B.4 if sewage sludge from your facility meets the ceiling concentrations in Table 1 of 40 CFR 503.13, the pollutant concentrations in Table 3 of §503.13, the Class A pathogen reduction requirements in §503.32(a), and one of the vector attraction reduction requirements in § 503.33(b)(1)-(8) and is land applied. Skip this section if sewage sludge from your facility does not meet all of these criteria.

B.4. Preparation of Sewage Sludge Meeting Ceiling and Pollutant Concentrations, Class A Pathogen Requirements, and One of Vector Attraction Reduction Options 1-8.

a. Total dry metric tons per 365-day period of sewage sludge subject to this section that is applied to the land: _____ dry metric tons

b. Is sewage sludge subject to this section placed in bags or other containers for sale or give-away for application to the land?

_____Yes _____No

Complete Section B.5. if you place sewage sludge in a bag or other container for sale or give-away for land application. Skip this section if the sewage sludge is covered in Section B.4.

B.5. Sale or Give-Away in a Bag or Other Container for Application to the Land.

a. Total dry metric tons per 365-day period of sewage sludge placed in a bag or other container at your facility for sale or give-away for application to the land: _____ dry metric tons

b. Attach, with this application, a copy of all labels or notices that accompany the sewage sludge being sold or given away in a bag or other container for application to the land.

Complete Section B.6 if sewage sludge from your facility is provided to another facility that provides treatment or blending. This section does not apply to sewage sludge sent directly to a land application or surface disposal site. Skip this section if the sewage sludge is covered in Sections B.4 or B.5. If you provide sewage sludge to more than one facility, attach additional pages as necessary.

B.6. Shipment Off Site for Treatment or Blending.

a. Receiving facility name _____

b. Mailing address _____

_____

c. Contact person _____

Title _____

Telephone number _____

d. Total dry metric tons per 365-day period of sewage sludge provided to receiving facility: _____

B.6. Shipment Off Site for Treatment or Blending. (con't)

e. Does the receiving facility provide additional treatment to reduce pathogens in sewage sludge from your facility?____ Yes ____ No

Which class of pathogen reduction is achieved for the sewage sludge at the receiving facility?

_____ Class A _____ Class B _____ Neither or unknown

Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce pathogens in sewage sludge:

_____

_____

f. Does the receiving facility provide additional treatment to reduce vector attraction characteristics of the sewage sludge?
_____Yes _____No

Which vector attraction reduction option is met for the sewage sludge at the receiving facility?

_____ Option 1 (Minimum 38 percent reduction in volatile solids)
_____ Option 2 (Anaerobic process, with bench-scale demonstration)
_____ Option 3 (Aerobic process, with bench-scale demonstration)
_____ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
_____ Option 5 (Aerobic processes plus raised temperature)
_____ Option 6 (Raise pH to 12 and retain at 11.5)
_____ Option 7 (75 percent solids with no unstabilized solids)
_____ Option 8 (90 percent solids with unstabilized solids)
_____ None

Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce vector attraction properties of sewage sludge.

_____

_____

g. Does the receiving facility provide any additional treatment or blending activities not identified in (c) or (d) above? ____ Yes ____ No

If yes, describe, on this form or another sheet of paper, the treatment or blending activities not identified in (c) or (d) above:

_____

_____

h. If you answered yes to (e), (f), or (g), attach a copy of any information you provide the receiving facility to comply with the "notice and necessary information" requirement of 40 CFR 503.12(g).

i. Does the receiving facility place sewage sludge from your facility in a bag or other container for sale or give-away for application to the land? _____ Yes _____ No

If yes, provide a copy of all labels or notices that accompany the product being sold or given away.

Complete Section B.7 if sewage sludge from your facility is applied to the land, <u>unless</u> the sewage sludge is covered in:

- **Section B.4 (it meets Table 1 ceiling concentrations, Table 3 pollutant concentrations, Class A pathogen requirements, and one of vector attraction reduction options 1-8); <u>or</u>**
- **Section B.5 (you place it in a bag or other container for sale or give-away for application to the land); <u>or</u>**
- **Section B.6 (you send it to another facility for treatment or blending).**

B.7. Land Application of Bulk Sewage Sludge.

a. Total dry metric tons per 365-day period of sewage sludge applied to all land application sites: 3,372.60 dry metric tons

B.7. Land Application of Bulk Sewage Sludge. (con't)

b. Do you identify all land application sites in Section C of this application? ✓ Yes _____ No

If no, submit a copy of the land application plan with application (see instructions).

c. Are any land application sites located in States other than the State where you generate sewage sludge or derive a material from sewage sludge? _____ Yes ✓ No

If yes, describe, on this form or another sheet of paper, how you notify the permitting authority for the States where the land application sites are located. Provide a copy of the notification.

_____

_____

Complete Section B.8 if sewage sludge from your facility is placed on a surface disposal site.

B.8. Surface Disposal.

a. Total dry metric tons of sewage sludge from your facility placed on all surface disposal sites per 365-day period: _____ dry metric tons

b. Do you own or operate all surface disposal sites to which you send sewage sludge for disposal?

_____ Yes _____ No

If no, answer B.8.c through B.8.f for each surface disposal site that you do not own or operate. If you send sewage sludge to more than one such surface disposal site, attach additional pages as necessary.

c. Site name or number _____

d. Contact person _____

Title _____

Telephone number _____

Contact is _____Site owner _____Site operator

e. Mailing address _____

_____

f. Total dry metric tons of sewage sludge from your facility placed on this surface disposal site per 365-day period: _____ dry metric tons

Complete Section B.9 if sewage sludge from your facility is fired in a sewage sludge incinerator.

B.9. Incineration.

a. Total dry metric tons of sewage sludge from your facility fired in all sewage sludge incinerators per 365-day period: _____ dry metric tons

b. Do you own or operate all sewage sludge incinerators in which sewage sludge from your facility is fired? _____ Yes _____ No

If no, complete B.9.c through B.9.f for each sewage sludge incinerator that you do not own or operate. If you send sewage sludge to more than one such sewage sludge incinerator, attach additional pages as necessary.

c. Incinerator name or number: _____

d. Contact person: _____

Title: _____

Telephone number: _____

Contact is: _____ Incinerator owner _____ Incinerator operator

B.9. Incineration. (con't)

e. Mailing address: _____

_____

f. Total dry metric tons of sewage sludge from your facility fired in this sewage sludge incinerator per 365-day period: _____ dry metric tons

Complete Section B.10 if sewage sludge from this facility is placed on a municipal solid waste landfill.

B.10. Disposal in a Municipal Solid Waste Landfill. Provide the following information for each municipal solid waste landfill on which sewage sludge from your facility is placed. If sewage sludge is placed on more than one municipal solid waste landfill, attach additional pages as necessary.

a. Name of landfill: ADVANCED DISPOSAL CEDAR HILL LANDFILL

b. Contact person: MARK DAVIS

Title: _____

Telephone number: _____

Contact is _____ Landfill owner ✓ Landfill operator

c. Mailing address: 1319 NO BUSINESS CREEK RD RAGLAND, AL 35131

_____

d. Location of municipal solid waste landfill:

Street or Route #: 1319 NO BUSINESS CREEK RD

County: _____

City or Town: RAGLAND State: AL Zip: 35131

e. Total dry metric tons of sewage sludge from your facility placed in this municipal solid waste landfill per 365-day period:

3,372.60 dry metric tons

f. List, on this form or an attachment, the numbers of all other Federal, State, and local permits that regulate the operation of this municipal solid waste landfill.

Permit Number	Type of Permit

g. Submit, with this application, information to determine whether the sewage sludge meets applicable requirements for disposal of sewage sludge in a municipal solid waste landfill (e.g., results of paint filter liquids test and TCLP test)

h. Does the municipal solid waste landfill comply with applicable criteria set forth in 40 CFR Part 258?

✓ Yes _____ No

FACILITY NAME AND PERMIT NUMBER:
Tull C. Allen Wastewater Treatment Plant AL0058408

Form Approved 1/14/99
OMB Number 2040-0086

FORM 2S NPDES

NPDES FORM 2S APPLICATION OVERVIEW

PRELIMINARY INFORMATION

This page is designed to indicate whether the applicant is to complete Part 1 or Part 2. Review each category, and then complete Part 1 or Part 2, as indicated. For purposes of this form, the term "you" refers to the applicant. "This facility" and "your facility" refer to the facility for which application information is submitted.

FACILITIES INCLUDED IN ANY OF THE FOLLOWING CATEGORIES MUST COMPLETE PART 2 (PERMIT APPLICATION INFORMATION).

1. Facilities with a currently effective NPDES permit.

2. Facilities which have been directed by the permitting authority to submit a full permit application at this time.

ALL OTHER FACILITIES MUST COMPLETE PART 1 (LIMITED BACKGROUND INFORMATION).

VigorOx® WWT II
Wastewater Disinfection Technology

Aquatic Toxicity and Fate of VigorOx® WWT II

PeroxyChem

Document xx-xx-WWT-14 | June 2014

Table of Contents

Definitions/Acronyms

EC_{50} The dose causing incapacitation to 50% of the population tested, determined by running several doses and estimating the EC_{50} statistically.

LC_{50} The dose causing lethality to 50% of the population tested, determined by running several doses and estimating the LC_{50} statistically.

IC_{50} The concentration of a substance which inhibits specific biological function in 50% of the test population

NOEC The highest dose tested that does not cause any toxic effects to the organisms tested.

Background

VigorOx® WWT II is an equilibrium peracetic acid solution that contains 15% peractic acid (PAA) by weight at full concentration. The solution exists as an equilibrium of PAA, hydrogen peroxide, acetic acid and water as per:

Acetic Acid Hydrogen Peroxide Peracetic Acid Water

The environmental fate and ecotoxicity of peracetic acid solutions has been detailed in the report[1] "Peracetic Acid and Its Equilibrium Solutions" by the European Centre for Ecotoxicology and Toxicology of Chemicals. Peracetic acid can be considered a reduced risk, alternative disinfectant based on its effectiveness, its physical - chemical properties and its low exposure potential and risk to the environment.

VigorOx WWT II is used for treating effluent wastewater from municipal and industrial treatment plants to reduce the coliform bacterial count to meet Federal, State and Local laws before water is discharged into a waterway. The typical in-use PAA concentrations will be less than 10 mg/L (ppm) with targeted outflow concentrations around 1 ppm or less, depending on the application and treatment requirements. Peracetic acid is an ideal disinfectant for wastewater application to efficiently and reliably control bacteria under normal operational conditions, including the range of wastewater flow rates and wastewater qualities, without producing toxic, mutagenic or carcinogenic disinfection by-products or persistent disinfectant residues that have adverse environmental effects[1]. This paper will review the environmental fate and ecotoxicological data for peracetic acid and the associated benefits as it applies to treating wastewater effluent.

Aquatic Fate of VigorOx WWT II

The aquatic fate of PAA is almost exclusively determined by degradation in the water phase and is due to a number of mechanisms, including abiotic decomposition, hydrolysis, biodegradation or reaction with organic compounds, and dilution. Hydrolysis results in the breakdown of PAA to acetic acid (vinegar) and hydrogen peroxide, which subsequently decomposes to oxygen and water. The rate of degradation is dependent upon temperature, pH and the presence of metals and oxidizeable organic components. It has been shown that at 20 °C, the decrease in PAA concentration is[2]:

Type of water	pH	Nominal PAA concentration (mg/L)	Measured Concentration (mg/L)		
			Day 0	Day 1	Day 2
Drinking water	6	10	10.3	0.5	0
Seawater	7	10	12.1	0.5	0

Table 1: The decay of peracetic acid at 20 °C in two water matrices.

Addition of COD (chemical oxidant demand), BOD (biological demand) or TSS (total suspended solids) would be expected to increase the degradation rate of the PAA, thereby reducing the longevity of PAA in the environment and its impact on aquatic life. As a result, peracetic acid does not persist long in the environment, unlike disinfection by-products (DBPs) generated by chlorination, and breaks down to the innocuous end products of water and vinegar. No other adverse reactions are known. Also, hydrogen peroxide has a very short lifetime within the environment, and results in the end products of water and oxygen.

The low octanol-water partition coefficient (K_{ow}) of peracetic acid and hydrogen peroxide, 0.3 and 0.4 respectively, indicate bioaccumulation in aquatic organisms is not likely. Additionally, the degradation product acetic acid will not bioaccumulate (K_{ow} = 0.68). The soil - sediment adsorption coefficients are also low. The US EPA June 3, 2010 *Summary for Product Chemistry, Environmental Fate, and Ecotoxicity Data for the Chlorine Registration Review Decision Document*[3] concludes that there is no potential for bioaccumulation or bioconcentration of peracetic acid. As a result, the environmental impact from peracetic acid will be minimal and short-lived

Aquatic Toxicity

The following table was compiled from reference 1 and the references therein. It shows the impact of various peracetic acid formulations on standard aquatic species conducted according to guideline laboratory study protocols.

Species	Duration	Composition (%)			Endpoint EC_{50} or LC_{50}	NOEC	Code of Reliability[d]
	(hours)	PAA	H_2O_2	Acetic Acid	(mg PAA / L)	(mg PAA / L)	
Algae							
Selenastrum capricornutum[a]	120	5.2	20	NS	0.18	0.13	2b
Selenastrum capricornutum[a]	72	18	0.3	NS	< 1.0	< 1.0	2b
Selenastrum capricornutum[a]	72	0.35	7	NS	0.035 – 0.35	0.035	2b
Invertebrates				**Immobility EC_{50}**			
Daphnia magna	48	15	14	28	0.50	0.15	2b
Daphnia magna	48	4.5	27.5	NS	1.1	0.45	2b
Daphnia magna	48	15.5	22	15	0.69	0.16	2b
Daphnia magna	48	5.2	20	NS	0.73	0.56	2b
Daphnia magna	48	18	0.3	NS	< 1.0	< 1.0	2b
Daphnia magna	48	0.35	7	NS	0.035 – 0.350	> 0.0.35	2b
				Lethality LC_{50}			
Crangon crangon[b]	96	12	20	8	15	6.7	2e
Mytilus edulis[b] embryo	48	12.5	19	18	0.27	0.13	2e
Crassostrea gigas[b] embryo	48	12.5	19	18	0.28	0.13	2e
Fish							
Oncorhynchus mykiss[c]	96	15	14	28	2.0	1.5	2b
Oncorhynchus mykiss[c]	96	15.5	22	15	0.91	0.16	2b
Oncorhynchus mykiss[c]	96	4.5	27.5	NS	1.0	0.45	2b
Oncorhynchus mykiss[c]	96	5.2	20	NS	1.6	0.82	2b
Lepomis macrochirus	96	4.5	27.5	NS	1.2	0.45	2b
Lepomis macrochirus	96	15.5	22	15	3.3	2.7	2b
Lepomis macrochirus	96	5.2	20	NS	1.1	0.47	2b
Brachydanio rerio	96	18	0.3	NS	1.0	< 1.0	2b
Brachydanio rerio	96	0.35	7	NS	~ 0.35	> 0.035	2b
Pleuronectes platessa[b]	96	12	20	8	11	6.7	2e

Table 2: Toxicity of Peracetic Acid Solutions on Aquatic Species

[a] presently known as *Pseudokirchneriella subccapitata* or *Rhaphidocelis subcapitata*
[b] saltwater species
[c] previous name *Salmo gairdneri*
NS – not stated

[d]Klimisch study Code of Reliability:
1 = reliable without restriction
2 = reliable with restrictions: 2b – guideline study with acceptable restrictions; 2e – study well documented, meets generally accepted scientific principles, acceptable for assessment. Reliability 2 (reliable with restrictions) - the concentration of the test substance was not monitored.

OECD Guideline 203 (Fish, Acute Toxicity Test, 2003) - 96 h LC_{50} for rainbow trout (*O. mykiss)* equals 0.53 mg/L

From the laboratory data presented above, a relationship is observed between the size of the organism and its sensitivity to peracetic acid. The smaller the test organism, the greater the sensitivity as compared to larger test organisms. It is suggested the small organisms are more sensitive to peracetic acid because their body-surface to body-weight ratio is high, which enables a higher uptake of PAA per gram body weight. Additionally, longer exposure times leads to more PAA toxicity to the organism. Peracetic acid toxicity to marine - estuarine organisms is found to be lower compared to fresh water species due to its shorter half life (< 1 hour) in the salt water environment.

The US EPA has classified the aquatic toxicity of PAA as highly toxic to algae *(Selenastrum capricornutum)* and aquatic invertebrates *(Daphnia magna)*, and moderately to slightly toxic to fish based on laboratory test results. Peracetic acid is less impactful to aquatic organisms than chlorine (see below).

Aquatic toxicity testing specific to VigorOx® WWT II at Waste Water Treatment Sites

Unlike laboratory studies, where test parameters are tightly controlled to produce dose lethality, peracetic acid dosed in wastewater effluent is rapidly biodegraded by multiple routes, including reaction with organic carbon and metals. In addition, dilution and dispersion into the receiving body of water further reduces the peracetic acid environmental concentration and impact to aquatic organisms as demonstrated. The aquatic toxicity of VigroOx WWT II in actual wastewaters is demonstrated in the following case studies.

1. Seven Day Chronic Static Renewal Definitive

Study performed by Hydrosphere Research for Clay County Utility Authority, Orange Park, FL

Test methods

Species	Dilution Series (%)	Test Method
C.dubia (water flea)	0, 12.5, 25, 50, 75, 100	EPA-821-R-02-013, method 1002.0
P. promelas (fathead minnow)	0, 12.5, 25, 50, 75, 100	EPA-821-R-02-013, method 1000.0

Table 3: Test methods for the chronic testing

Chronic Tests Results

Percent Effluent	*C. dubia*		*P. promelas*	
	Final Survival (%)	Three Brood Totals (Ave # of neonates / female)	Final Survival (%)	Average Dry Weight (mg / fish)
Control	100	34.5	100	0.682
12.5	100	32.8	100	0.613
25	100	32.6	100	0.662
50	100	32.8	100	0.730
75	100	30.1	100	0.774
100	100	28.3	100	0.743
IC_{25}	> 100%		> 100%	

Table 4: Results for the Chronic Test on VigorOx WWT II

Conclusions:

- No chronic toxicity was exhibited for either the water flea or flathead minnow species
- Both species achieved an IC_{25} > 100% effluent

2. Whole Effluent Toxicity Testing

Study performed by North Shore Sanitary District

VigorOx WWT II dosing: ~ 0.8 mg/L
VigorOx WWT II residual ~ 0.04 mg/L

Ceriodaphina dubia acute toxicity
48 hour, juvenile (< 24 hours old)

Treatment	Lab control	6.25% effluent	12.5% effluent	25% effluent	50% effluent	100% effluent
Number of live organisms	20 of 20	20 of 20	20 of 20	20 of 20	20 of 20	20 of 20
Survival (%)	100	100	100	100	100	100
pH	7.2 – 8.1	7.4 – 8.3	7.6 – 8.4	7.7 – 8.4	7.6 – 8.4	7.5 – 8.4
Temp. range (deg C)	24.3 – 24.4	24.1 – 24.2	24.0 – 24.2	24.0 – 24.2	23.7 – 24.1	23.7 – 24.0
Dissolved Oxygen (mg/L)	7.8 – 7.8	7.8 – 7.9	7.6 – 7.8	7.8 – 8.1	7.8 – 8.3	7.8 – 9.0

Table 5: Acute toxicity test results on *C. dubia* with VigorOx WWT II

Fathead Minnow (*Pimephales promelas)* 96 hour acute toxicity
96 hour, larvae (1 – 14 days old)

Treatment	Lab control	6.25% effluent	12.5% effluent	25% effluent	50% effluent	100% effluent
Number of live organisms	20 of 20	20 of 20	20 of 20	20 of 20	20 of 20	20 of 20
Survival (%)	100	100	100	100	100	100
pH	7.2 – 8.4	7.4 – 8.3	7.6 – 8.3	7.7 – 8.3	7.6 – 8.3	7.5 – 8.4
Temp. range (deg C)	23.9 – 25.3	23.8 – 25.4	23.9 – 25.4	23.8 – 25.3	23.9 – 25.3	23.8 – 25.3
Dissolved Oxygen (mg/L)	7.2 – 7.9	7.2 – 8.1	6.9 – 8.0	7.1 – 8.1	6.9 – 8.3	6.8 – 9.0

Table 6: Acute toxicity test results on *P. promelas* with VigorOx WWT II

Conclusions:

- No chronic toxicity was exhibited for either the water flea or flathead minnow species
- Both species achieved an IC_{25} > 100% effluent

Comparison to Chlorine

The US EPA summary report[3] states that chlorine is highly to very highly toxic to all forms of aquatic life. The following table was compiled from reference 3 and the references therein. It shows the impact of chlorine on standard aquatic species conducted according to guideline laboratory study protocols.

Species	% active	Study Duration (hours)	Endpoint EC_{50} or LC_{50}	Toxicity unit	Toxicology Category
Fish					
Oncorhynchus mykiss	29	96	0.2	ppm	Highly toxic
Leponis macrochirus	29	96	0.28	ppm	Highly toxic
Invertebrates					
Daphnia magna	29	48	0.037	ppb	Very highly toxide

Table 7: The Impact of Hypochlorite on Aquatic Toxicity

In general, comparing Table 7 to Table 2, chlorine EC_{50} or LC_{50} values are an order of magnitude lower than those for peracetic acid solutions.

In addition, in the presence of naturally occurring organic matter, chlorine may generate a number of disinfection by-products, including trihalomethanes (such as chloroform and bromodichloromethane) and haloacetic acids. The US EPA currently regulates trihalomethanes in drinking water at 80 ppm and haloacetic acid at 60 ppm due to their potential chronic health effects. Trihalomethanes and haloacetic acids degrade very poorly in the environment, and as a result, can remain within the environment for very long times.

VigorOx WWT II does not generate either trihalomethanes or haloacetic acids, as it does not contain chlorine.

General Conclusions

VigorOx® WWT II peracetic acid provides superior wastewater disinfection without the generation of disinfection by-products (DBPs) such as trihalomethes or haloacetic acids. It is short lived in the environment and breaks down to the innocuous end-products, water and vinegar (acetic acid). Impacts by this product on aquatic fauna will be limited to the initial mixing zone, and due to its degradation rate in the environment and dilution into the receiving body, is not expected to have any significant aquatic toxicity impact beyond this zone.

VigorOx WWT II:

- Has a short lifetime in the environment
- Does not generate chlorinated disinfection by-products
- Generally has an aquatic toxicity an order of magnitude less than chlorine
- Environmental impacts will be limited to the mixing zone due to decomposition and dilution
- Will not bio-accumulate or bio-concentrate

Appendix

1. J. Koivunen, Teinonen-Tanski, H. "Peracetic Acid (PAA) disinfection of primary, secondary and tertiary treated municipal wastewaters". **Water Research** 39, p 4445, 2005.
2. European Centre for Ecotoxicology and Toxicology of Chemicals. JACC #40, "Peracetic Acid (CAS No 79-21-0) and Its Equilibrium Solutions", January 2001.
3. US EPA. "Summary of Product Chemistry, Environmental Fate, and Ecotoxicity Data for the chlorine Registration Review Decision Document", June 3, 2010.

VigorOx® WWT II Wastewater Disinfection Technology and Viruses

VigorOx® WWT II is an equilibrium peracetic acid solution that contains 15% peracetic acid (PAA) by weight at full concentration. The solution exists as an equilibrium of PAA, hydrogen peroxide, acetic acid and water as per:

Acetic Acid Hydrogen Peroxide Peracetic Acid Water

Peracetic acid has been used as a low temperature biocide for the past thirty years in many industries, including medical device disinfection and sterilization, food and food processing sanitization, and asceptic bottle packaging. It has proven effective on bacteria, viruses, yeasts and spores[1], depending upon its usage rate and available contact time. While the underlying mechanism of action is not well known, PAA acts as an oxidant: denaturing proteins, disrupts cell wall permeability, and oxidizes sulfhydral and sulfur bonds in proteins, enzymes, and other metabolites.

Reduction of Viruses in Wastewater

Currently, there are no federal or state requirements for virus reduction in municipal wastewater effluents. Recently, the US EPA stated that they are considering development of guidelines for the reduction of viruses in wastewaters, but have not published draft guidance at this time. It is anticipated that the US EPA will be publishing draft guidance on the analytical measurement of viruses in 2016, with potential, non-risk based, draft guide-lines on the control of viruses, using MS2 bacetriophage as a surrogate model, sometime in 2017, based on comments by US EPA at several, recent technical conferences. A period of public commentary will then follow the release of the draft guidance, and as a result, finalization of any federal regulation regarding the control of viruses in wastewater may not take effect until at least potentially 2020 in PeroxyChem's estimation.

Regulation on virus reduction in wastewater will have a great impact on the municipal wastewater industry, as it will need to be demonstrated for all wastewater disinfection technologies the ability to meet the potential new viral limits. This includes all currently established disinfection technologies that are being used for the control of bacterial pathogens. Disinfection technologies that are currently emplaced for the control of bacteria will need to be tested to meet new viral standards: chlorination will need to be demonstrated effective at given treatment plants where ammonia, if present, may convert the chlorine to chloramines; UV systems may need to be resized to meet new target organisms. This will be true for peracetic acid disinfection systems as well.

VigorOx WWT II Peractic Acid and Its Use to Meet Potential New Virus Standards

VigorOx® WWT II
Wastewater Disinfection Technology

VigorOx WWT II PAA has been shown to be economically cost-effective for the treatment of bacteria, such as coliforms, E. coli and Enteroccocus, in municipal wastewater streams. Typically, when evaluating VigorOx WWT II for use at a treatment plant, jar testing or pilot reactor trialing is used to determine the optimal PAA dosage to achieve effective kill under economically viable conditions.

With respect to virus kill, there are peer-reviewed literature articles demonstrating that peracetic acid can reduce viral loading in wastewaters. This is shown in Table 1.

Table 1 Viral Inactivation with PAA

Matrix	Organism	Inactivation	Dose	Contact Time	Reference
Enhanced primary effluent [1]	Indigenous MS2	1 log	1.5-3.0 mg/l	60 minutes	Gehr et al. 2003
Secondary effluent	MS2	3.5 log	5 mg/l	120 minutes	Lazarova et al., 1998
Secondary effluent [2]	Indigenous F+ coliphages	0.6 log	1.5 mg/l	20 minutes	Zanetti et al., 2007
Seeded wastewater	RNA Phage	2 log	25 mg/l	5 minutes	Rajala-Mustonen et al., 1997
Tertiary effluent	MS2	0.35 log	5 mg/l	30 minutes	WateReuse Foundation, 2012
Peptone water	MS2	1.3 log	15 mg/l	10 minutes	Koivunen and Heinonen-Tanski, 2005
Demineralized water	MS2	>4 log	15 mg/l	5 minutes	Baldry et al., 1991
Lab water (pH 5.0)	MS2 (dispersed virus)	4 log	40 mg/l	30 minutes	Mattle et al., 2011
Lab water (pH 3.6)	MS2 (aggregated virus)	4 log	40 mg/l	60 minutes	Mattle et al., 2011
Secondary effluent	coliphages	1-2 log	5 mg/l	30 minutes	Freese et al., 2002
Secondary effluent	Φx174	7.5 log	10 mg/l	120 minutes	Lazarova et al., 1998
Seeded wastewater	DNA Phage	5 log	25 mg/l	5 minutes	Rajala-Mustonen et al., 1997
Demineralized water	Φx174	>4 log	30 mg/l	5 minutes	Baldry et al., 1991
Secondary effluent [2]	Indigenous Somatic coliphages	0.6 log	1.5 mg/l	20 minutes	Zanetti et al., 2007

Notes:
1. Enhanced physicochemical processes (ferric and/or alum coagulation) for suspended solids and phosphorus removal. COD 123-240 mg/l, TSS 16-45 mg/l, and turbidity 16-31 NTU.
2. Secondary effluent characteristics: pH 6.7-6.8, COD 26-28 mg/l, and TSS 6.1-17 mg/l.

In general, for peracetic acid, the "concentration times contact time" factor (C*t) needed to achieve viral reduction will be greater than that for bacteria. However, as with bacteria, the required C*t will be dependent upon the wastewater matrix and the target reduction goals for each treatment plant, requiring jar testing or pilot trialing to ascertain the optimal dosing based on a viral kill efficacy and economics. Similar differences in treatment intensity between viruses and bacteria are typically observed with most disinfection technologies. Note currently, VigorOx WWT II is not labeled for treatment of viruses.

As there are no current viral reduction requirements in North America, the cost effective rate of application for hypochlorite (or chlorine chemistry) in actual wastewater is not well known either. Recent laboratory work performed for the Ministry of the Environment, Ontario Province, Canada demonstrated that VigorOx WWT II PAA was able to achieve statistically equivalent reductions on Coxsackievirus B6 as compared to hypochlorite in actual wastewater from a local treatment plant (PeroxyChem, 2014). The conditions of the test compared VigorOx WWT II concentrations as low as 1.5 ppm to hypochlorite at 1.6 ppm as Cl_2 with contact time of 30 minutes.

Consideration of VigorOx WWT II Disinfection

When considering the use of VigorOx WWT II disinfection technology at a wastewater treatment plant in view of the potential US EPA draft guidance on virus reduction, several factors should be considered:

- It will be several years before any potential virus reduction requirements on the federal level are set.
- All current wastewater disinfection technologies will require viral efficacy testing and possibly re-design of current disinfection systems.
- Implementation of VigorOx WWT II disinfection technology is simple (it only requires installation of storage tanks, chemical feed pumps and associated controls) and, contrary to other disinfection systems such as UV, does not require significant capital investment since equipment is typically leased to the plant's owner. If other disinfection technologies were to prove more cost-effective to meet pathogen limits in the future, plant owners would not face large sunk or conversion costs to switch to alternative technologies.

As a result, *potential* future regulatory guidelines should not impact the selection of VigorOx WWT II to meet today's permit requirements.

References

1 CDC "Guideline for Disinfection and Sterilization in Healthcare Facilities", 2008.

2 Baldry, M.G.C., French, M.S., Slater, D., 1991. The activity of peracetic acid on sewage indicator bacteria and viruses. Water Sci. Technol. 24 (2), 353–357.

3 Freese, S.D., Nozaic, D.J., Bailey, I., Trollip, D.L., 2002. Alternative Disinfectants for Wastewater Effluents: Viable or Prohibitively Expensive? Biennial Conference of the Water Institute of Southern Africa, Durban South Africa, May 2002.

4 Gehr, R., Wagner, M., Veerasubramanian, P., Payment, P., 2003. Disinfection efficiency of peracetic acid, UV and ozone after enhanced primary treatment of municipal wastewater. Water Res. 37, 4573–4586.

5 Koivunen, J., Heinonen-Tanski, H., 2005. Inactivation of enteric microorganisms with chemical disinfectants, UV irradiation and combined chemical/UV treatments. Water Res. 39, 1519–1526.

6 Koivunen, J., Heinonen-Tanski, H., 2005a. Peracetic acid (PAA) disinfection of primary, secondary and tertiary treated municipal wastewaters. Water Research. 39 (18), 4445-4453.

7 Lazarova, V., Janex, M., Fiksdal, L., Oberg, C., Barcina, I., Pommepuy, M., 1998. Advanced wastewater disinfection technologies: short and long term efficiency. Water Sci. Technol. 38 (12), 109–117.

8 Mattle, M., Crouzy, B., Brennecke, M., Wigginton, K., Perona, P., Kohn, T., 2011. Impact of virus aggregation on inactivation by peracetic acid and implications for other disinfectants. Environmental Science and Technology. 45 (18), 7710-7717.

9 Rajala-Mustonen, R.L., Toivola, P.S., Heinonen-Tanski, H., 1997. Effects of peracetic acid and UV irradiation on the inactivation of coliphages in wastewater. Water Sci. Technol. 35 (11–12), 237–241.

10 WateReuse Foundation, 2012. Study of Innovative Treatments for Reclaimed Water. WateReuse Foundation. WRF-02-009.

11 Zanetti, F., De Luca, G., Sacchetti, R., Stampi, S., 2007. Disinfection Efficiency of Peracetic Acid (PAA): Inactivation of Coliphages and Bacterial Indicators in a Municipal Wastewater Plant. Environmental Technology. 28 (11), 1265-1271.

12 PeroxyChem. Determination of Performance Equivalency Between Chlorine and VigorOx WWT II in Disinfection of Wastewater. Report to Ontario MOE, 2014.

and two partially treated surface waters accounted for variation in CT values for 3-$\log_{10}$ reduction of coxsackievirus B5 (monochloramine CT values varied between 240 and 320 mg-min/L depending on water type), echovirus 11 (550–950 mg-min/L), and human adenovirus 2 (300–720 mg-min/L).[12] Despite the importance of the water matrix in determining inactivation rates, there is a paucity of information on monochloramine inactivation of viruses in MWW.

There is also growing interest in alternatives to chlorine-based disinfection of MWW due to security concerns with gaseous chlorine, general safety issues, and DBP toxicity concerns after effluent discharge into the environment.[13] As a result, there has been renewed interest in peracetic acid (PAA) as a disinfectant for MWW. PAA is recognized as an efficient organic bactericide, sporicide, fungicide, and algaecide, and has been applied in the food-processing, beverage, pharmaceutical, and textile industries.[14] PAA requires no post-treatment neutralization, and DBPs formed by PAA are mostly carboxylic acids that have less mutagenicity, carcinogenicity, and genotoxicity than halogenated DBPs produced from chlorination.[15,16] Furthermore, laboratory and pilot studies have demonstrated PAA's efficacy in reducing *Escherichia coli* and fecal coliform levels to meet permit regulations in MWW effluent.[17,18]

PAA has been reported to exhibit modest inactivation of viruses in MWW, usually around one log, in studies employing realistic concentrations and contact times for wastewater treatment plant (WWTP) operations.[18−21] However, all published studies on PAA inactivation of viruses in MWW have looked exclusively at seeded or naturally occurring coliphage.[18−24] Because evidence has suggested that coliphage inactivation data may not be representative for mammalian viruses such as norovirus (NoV),[25,26] there is need to comparatively assess PAA inactivation of NoV and coliphage in MWW.

NoV is now recognized as the number one cause of acute gastroenteritis sporadic cases and outbreaks globally across all age groups.[27] In the United States, NoVs are estimated to cause 21 million illnesses and 71 000 hospitalizations annually.[28] Furthermore, despite recent advancements,[29] researchers have struggled to develop an easily reproducible cell culture model to propagate HuNoV in the laboratory. As a result, murine norovirus (MNV), one of the first NoVs to be cultured in a laboratory, has been suggested as a human NoV surrogate.[30] MNV is included in genogroup GV of norovirus[31] and shares substantially greater morphological and genetic similarities with human NoV than coliphage.[32] These facts have led researchers to conclude that MNV is likely to be more predictive of human norovirus inactivation by engineered treatment systems than coliphage,[33,34] though this has been difficult to prove experimentally due to the historical lack of cell culture system for human NoV. Additionally, utilizing MNV in treatment studies allows researchers to measure infectivity reduction, which is considered the gold standard measurement in treatment and inactivation studies.[35]

Because there are no identified data in the literature on inactivation of NoV by PAA and chloramine in MWW, the objective of this study was to comparatively assess these disinfectants using MNV as a surrogate virus. Additionally, inactivation of MNV was compared to the more commonly employed surrogate MS2 coliphage. To our knowledge this is the first study utilizing a norovirus to measure infectivity reduction in wastewater by chemical oxidation.

EXPERIMENTAL SECTION

Water Matrices. A 0.01 M phosphate buffer solution (pH 7) and municipal secondary treated effluent (nonchlorinated) from a water resource recovery facility at the Metro Wastewater Reclamation District (Denver, CO) were used in this study. Water quality analysis of the secondary wastewater effluent (Supporting Information (SI) Table S1) was performed upon sample arrival using methods as previously described.[36]

MNV Stock Preparation. MNV stocks were propagated in RAW 267.4 cells and concentrated as previously described.[37] Following concentration, MNV stocks were further purified by ultracentrifugation on a sucrose cushion[38] in order to remove cell culture components that would cause oxidant demand during disinfection experiments. Briefly, filtered MNV stock was laid over sterile-filtered 20% sucrose solution in an Ultraclear centrifuge tube (Beckman, Brea, CA) and centrifuged at 95 000*g* for 3 h. After centrifugation the sucrose and media were aspirated and the procedure repeated using the same ultracentrifuge tube in order to further concentrate the virus. The virus pellet was then resuspended in 600 μL of Dulbecco's phosphate buffered saline (D-PBS), portioned, and stored at −80 °C.

MS2 Stock Preparation. MS2 coliphage stocks were propagated as previously described.[37] MS2 stocks were further concentrated and purified using a 100 000-Da ultramembrane filter (Amicon Ultra; Millipore Corp., Bedford, MD) to increase the virus titers and remove soluble and low molecular weight components from the supernatant. Following initial concentration in the membrane (viruses were retained while low-molecular-weight components passed through), viral stocks were then washed three times by adding 14 mL of D-PBS into the 1 mL of virus-containing retentate and centrifuging the membrane (4000*g* for 10 min) each time. Purified stocks were portioned and stored at −80 °C.

In order to ensure monodispersed MS2 virus after concentration by Amicon filtration, an aliquot of MS2 stock was diluted in DI water to approximately 10^{10} PFU/mL and analyzed by dynamic light scattering (DLS) using a Zetasizer Nano ZS (Malvern, UK). SI Figure S1 shows DLS results that indicate MS2 remained monodispersed after Amicon filtration.

Infectivity Plaque Assays. Enumeration of infective MNV and MS2 viral particles was performed using standard 10-fold dilution plaque assays. For MNV, the plaque assay previously described by Bae and Schwab[37] was followed. MS2 (ATCC 16696-B1) bacteriophage stocks were generated using the double agar layer (DAL) method[39] with *E. coli* Famp (ATCC 700891) bacterial host.

Peracetic Acid and Monochloramine. Peracetic acid (PAA) stock solutions were obtained from commercially available concentrate (VigorOx WWT II; PeroxyChem, PA). PAA residuals were measured by the modified N,N-diethyl-*p*-phenylenediamine (DPD; > 98%, Sigma-Aldrich) colorimetric method with potassium iodide.[40,41] The modified DPD method was also used for H_2O_2 measurement with the addition of ammonium molybdate solution (Hach Company, CO) as a catalyst.[42]

Monochloramine master stock solution was freshly prepared by modifying the method from Shang and Blatchley.[43] Ammonium chloride solution was spiked with chlorine concentrated solution (10−15%, Sigma-Aldrich) at a chlorine:nitrogen mass ratio of 3:1 and the mixture was allowed to react for 1 h before use. The monochloramine master stock

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

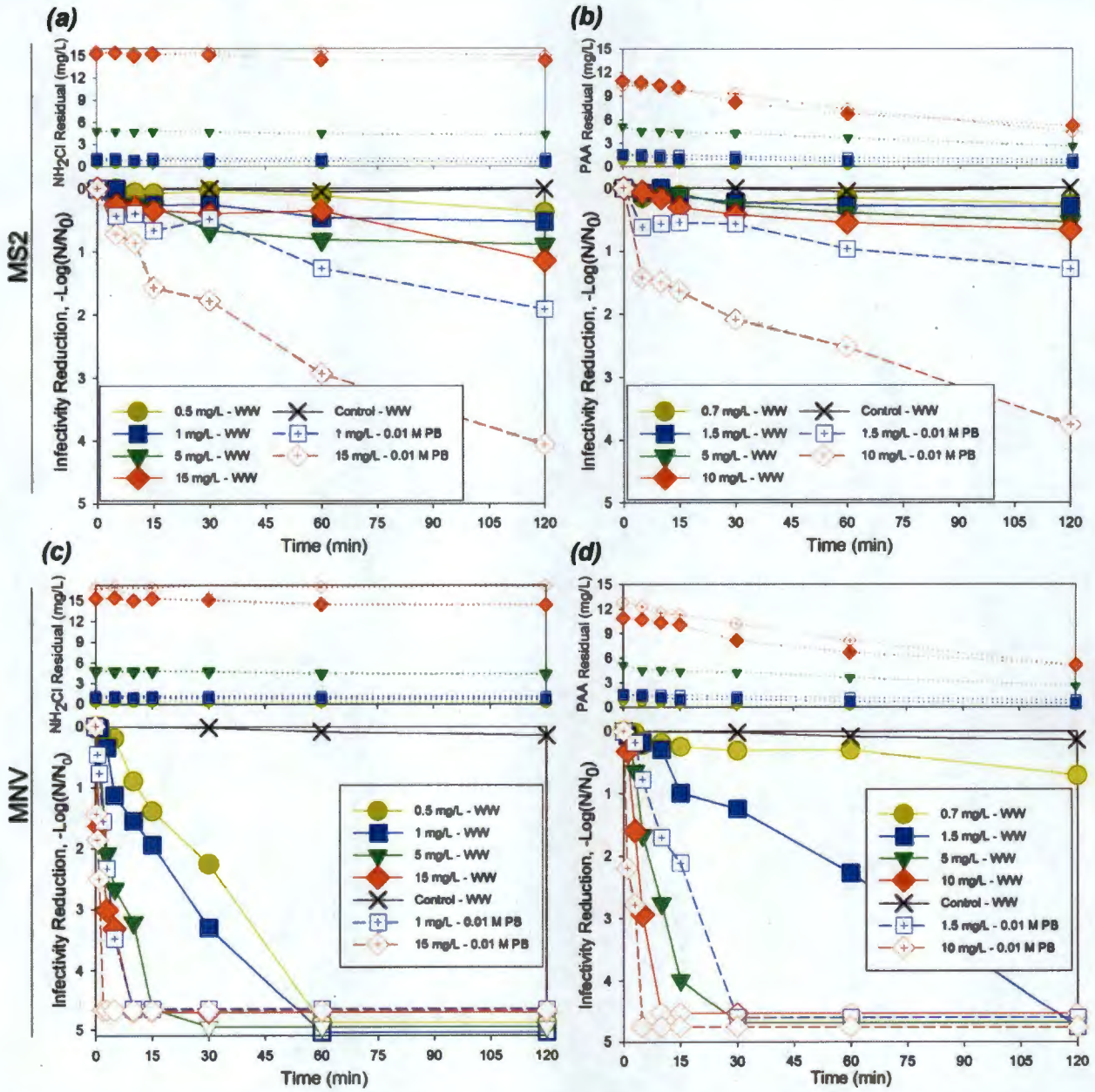


Figure 1. Temporal profiles for reduction of viral infectivity in secondary effluent wastewater (WW) and 0.01 M phosphate buffer (PB) for (a) MS2 by NH_2Cl, (b) MS2 by PAA, (c) MNV by NH_2Cl, and (d) MNV by PAA. Hollow symbols with no shading or crosses represent viral concentrations below the sensitivity limit of the assay.

solution was then diluted to desired concentration for the disinfection experiment. The DPD colorimetric method was also used to measure monochloramine residuals.[44]

Experimental Procedure. All viral inactivation experiments were conducted 20 °C and at ambient pH (7.1) for MWW and pH 7.0 for PB. Sterile, chlorine demand-free 125 mL Erlenmeyer flasks containing an initial volume of 95 mL of water matrix, 5 mL of disinfectant, and 1 mL of virus cocktail comprised of concentrated, purified MNV and MS2 were employed for the disinfection experiments. Virus concentrations in the final volume were approximately 1×10^5 PFU/mL. Flasks were continuously mixed throughout the experiment. After the water matrix and virus were added to the flask, 5 mL of disinfectant (PAA or NH_2Cl), adjusted to achieve the final desired concentration, were added. Four PAA doses (0.7, 1.5, 5, and 10 mg/L) and four NH_2Cl doses (0.5, 1, 5, 10 mg/L) were selected for evaluation.

Sampling was performed prior to the addition of disinfectant and at preselected time points after the addition of disinfectant up to 120 min. At each sampling time point, 4 mL were removed and immediately quenched with sodium thiosulfate (600 μg/mL) for infectious virus analysis. For experiments with PAA, the quenching mixture also included catalase (2.5 mg/L).

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

Table 1. Summary of Best Fit Model Parameters for MS2 and MNV Infectivity Reduction by PAA and NH_2Cl in Municipal Wastewater (WW) and 0.01 M Phosphate Buffer (PB)[a]

virus	matrix	disinfectant	best model	k'	k	n	m	x	σ	SSE
MS2	WW	NH_2Cl	IGF Hom	0.0006	0.024	0.371	0.592		0.162	0.717
MS2	WW	PAA	IGF Hom	0.0071	0.018	0.442	0.578		0.061	0.099
MNV	WW	NH_2Cl	Hom-Power Law	0.0006	0.001	1.417	1.786	1.523	0.199	0.913
MNV	WW	PAA	IGF Hom	0.0071	0.012	1.554	1.208		0.250	1.638
MS2	0.01 M PB	NH_2Cl	IGF Hom	0.0004	0.128	0.303	0.553		0.153	0.304
MS2	0.01 M PB	PAA	IGF Hom	0.0061	0.169	0.550	0.387		0.167	0.362
MNV	0.01 M PB	NH_2Cl	IGF Hom	0.0004	0.979	0.370	0.730		0.219	0.430
MNV	0.01 M PB	PAA	Power Law	0.0061	0.020	0.620		1.363	0.149	0.179

[a]σ: standard deviation of the residual errors. SSE: sum of squares of the errors.

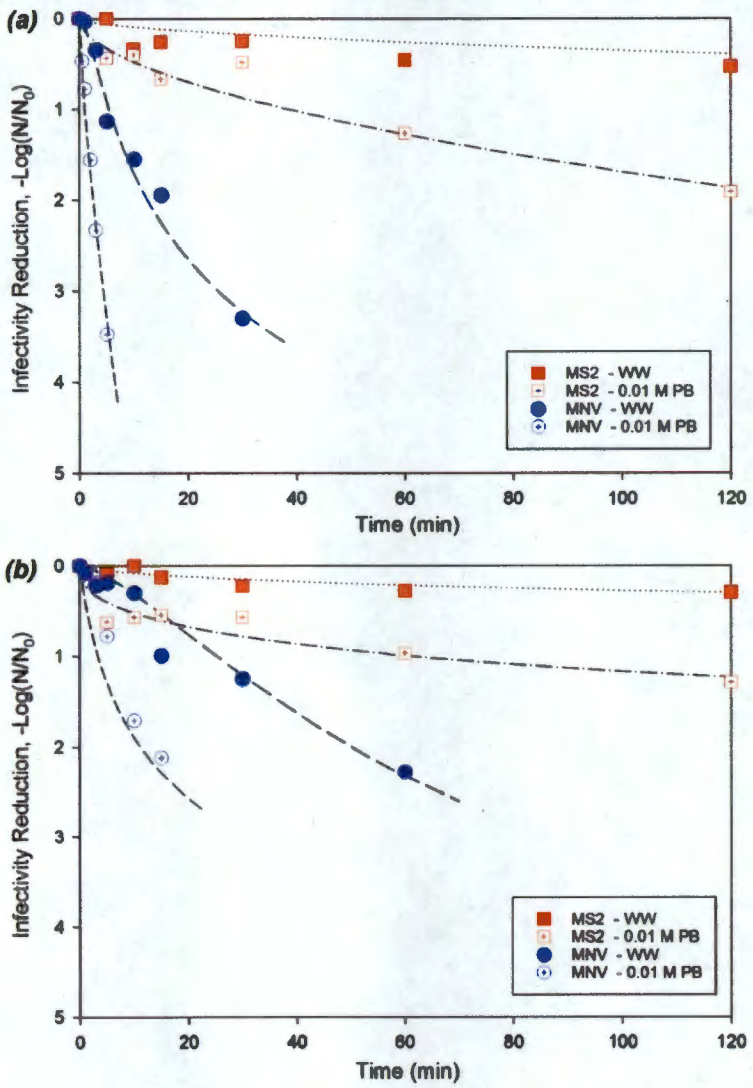


Figure 2. Examples of best model fits shown for MS2 and MNV infectivity reduction in secondary effluent wastewater (WW) and 0.01 M phosphate buffer (PB) by (a) 1 mg/L NH_2Cl and (b) 1.5 mg/L PAA.

Quenched samples were then portioned into 1.5 mL microcentrifuge tubes and stored at −80 °C.

Kinetic Modeling and Statistical Analyses. Disinfectant decay rate constants (k') for each experiment were calculated by regressing measured residuals using the least-squares method. First-order kinetics were assumed according to the equation:

$$C = C_0 \cdot e^{-k't} \quad (1)$$

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

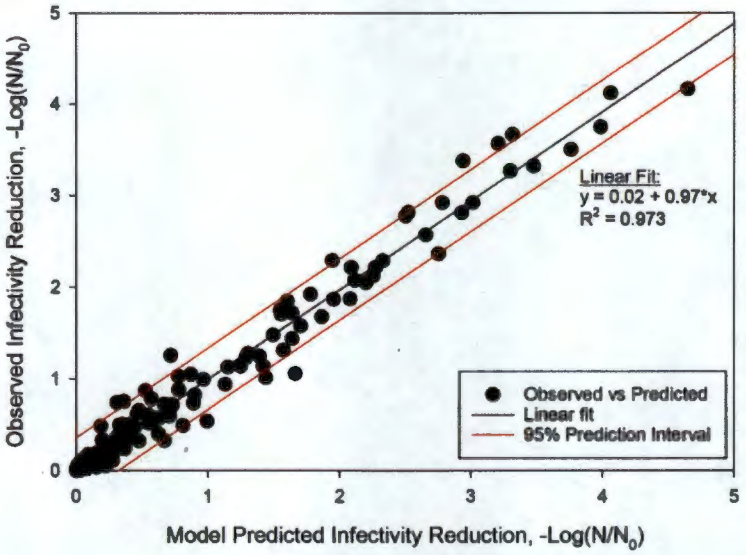


Figure 3. Observed virus infectivity reduction versus model predicted virus infectivity reduction for all viral experimental data, excluding nondetects.

where k' = first-order disinfectant decay rate constant, C = observed disinfectant residual (mg/L), C_0 = initial disinfectant dose (mg/L), and t = time from start of experiment to time of sample (min).

Viral infectivity reduction was determined by calculating the negative log of the ratio of surviving organisms to initial organisms (N/N_0) at sample times and fit by a series of well-validated inactivation models derived from the generalized inactivation rate:

$$r_d = \frac{dN}{dt} = -kC^n m N^x t^{m-1} \tag{2}$$

where r_d = inactivation rate, n, m, and x = dimensionless model parameters, k = inactivation rate constant, N = viral density (PFU/mL), C = disinfectant concentration (mg/L), T = contact time (min).

To account for the effect of disinfect decay throughout an experiment, eq 1 can be substituted into eq 2 and the resulting expression can be integrated to derive the specialized inactivation models employed in this study, which included the Chick-Watson,[45]

$$\log\left(\frac{N}{N_0}\right) = -\frac{k}{k'n}(C_0^n - C_t^n) \tag{3}$$

the Incomplete Gamma Function (IGF) Hom,[46]

$$\log\left(\frac{N}{N_0}\right) = -\frac{kmC_0^n}{(k'n)^m}\cdot\gamma(m, nk't) \tag{4}$$

the Power Law,[47]

$$\log\left(\frac{N}{N_0}\right) = -\frac{\log\left[1 + (x-1)\cdot\frac{k}{k'n}(C_0^n - C_t^n)\cdot N_0^{x-1}\right]}{(x-1)} \tag{5}$$

and the Hom-Power Law,[48]

$$\log\left(\frac{N}{N_0}\right) = -\frac{\log\left[1 + (x-1)\cdot\frac{kmC_0^n}{(k'n)^m}\cdot\gamma(m, nk't)\cdot N_0^{x-1}\right]}{(x-1)} \tag{6}$$

These models were fit to experimental data using the least-squares method. Data points below the sensitivity limit of the assay were excluded from the analysis. Model fit was assessed by comparing the residual sum of squared errors (SSE). Partial F-tests were performed to assess significance of additional parameters in more highly parametrized models (α = 0.05). Model errors were checked for normality using the Shapiro-Wilk statistical test. Modeling and statistical analysis were performed in Microsoft Excel and R (www.r-project.org).

RESULTS AND DISCUSSION

Kinetic Modeling of Virus Inactivation Data. Temporal profiles of viral infectivity reduction by monochloramine and PAA in both MWW and PB are shown for MS2 and MNV in Figure 1. Inactivation models employed in this study were fit to the viral infectivity reduction data to account for the fact that the concentration−time (CT) concept is in fact a reduction of the C^nT parameter found in the generalized inactivation rate equation, where n is not always equal to 1. Data were segmented by virus, water type, and disinfectant type, and the best-fit model for each scenario is presented in Table 1 with associated parameters. Modeling results for nonselected models along with Shapiro-Wilk test statistics for all model residuals are provided in the SI. The table shows that the IGF Hom model provided the best fit to the viral infectivity reduction data for six of the eight virus-water type-disinfectant scenarios. The IGF's ability to account for virus tailing in experimental data likely contributed to the effectiveness of the Hom-type models.

Examples of experimental data with associated best-fit model are provided in Figure 2 for visual observation of fit. Doses of 1 mg/L NH_2Cl and 1.5 mg/L PAA were selected for presentation because of their relevance to typical wastewater treatment plant (WWTP) operations. Model fits for all scenarios are shown in Figure 3 where observed infectivity reduction is plotted versus model-predicted infectivity reduction. Together, Figures 2 and

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

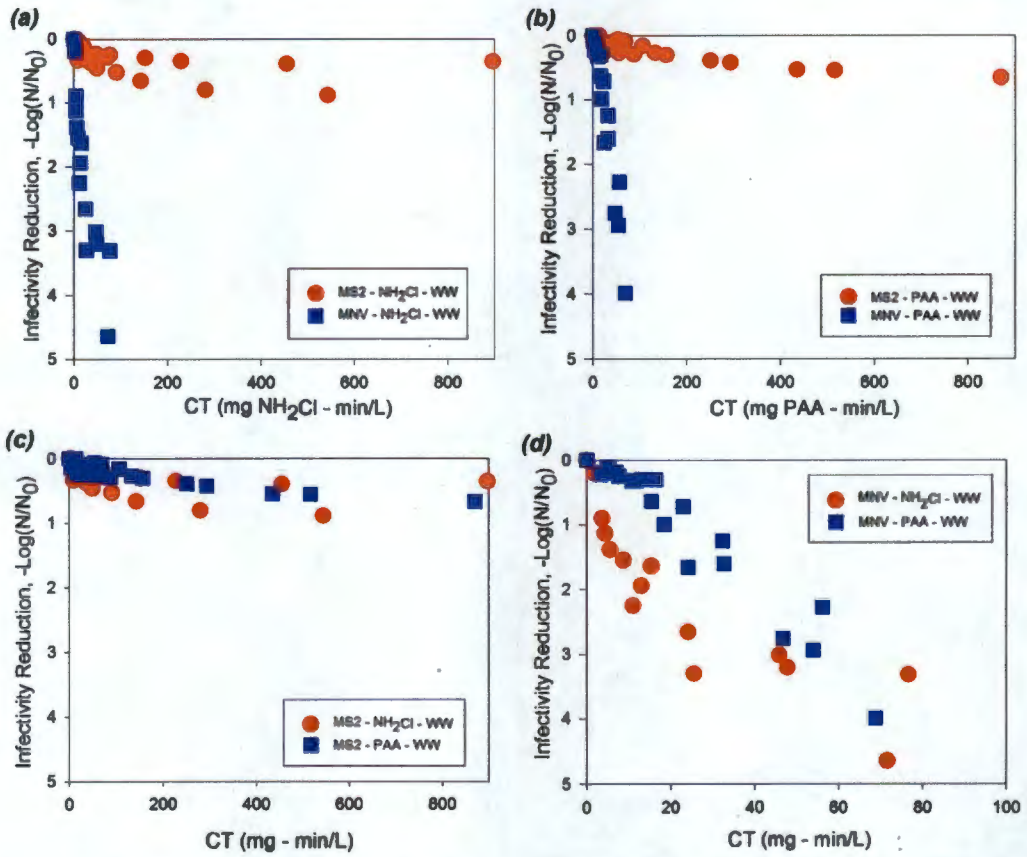


Figure 4. (a) Comparison of NH_2Cl CT values for infectivity reduction of MS2 bacteriophage and MNV in secondary effluent wastewater (WW), (b) Comparison of PAA CT values for infectivity reduction of MS2 bacteriophage and MNV in WW, (c) Comparison of NH_2Cl and PAA CT values for infectivity reduction of MS2 in WW, and (d) Comparison of NH_2Cl and PAA CT values for infectivity reduction of MNV in WW (note different CT scale).

3 demonstrate that selected models were able to effectively represent experimental data.

Effect of Water Matrix on Viral Infectivity Reduction. The effect of water matrix on viral infectivity reduction can be examined through application of best-fit models. After 120 min of contact time, predicted MS2 reduction in MWW at a high monochloramine dose of 15 mg/L was 1.1 log PFU/mL, whereas predicted reduction at a high PAA dose of 10 mg/L was only 0.7 log PFU/mL. Higher infectivity reductions were observed in PB: a monochloramine dose of 1 mg/L in PB achieved a predicted reduction of 1.8 log PFU/mL after 120 min, while a monochloramine dose of 15 mg/L achieved a predicted reduction of 4.1 log PFU/mL over the same contact time. Likewise, PAA doses of 1.5 and 10 mg/L in PB achieved predicted infectivity reductions of 1.2 and 3.4 log PFU/mL, respectively, after 2 h of contact time.

Similar trends were observed for MNV, where infectivity reductions were higher in PB than in MWW. Predicted infectivity reductions for MNV by monochloramine after 10 min of contact time at an initial dose of 1 mg/L were 1.9 log PFU/mL and 5.2 log PFU/mL in MWW and PB, respectively. Predicted infectivity reductions by PAA after 30 min of contact time at an initial dose of 1.5 mg/L were 1.2 and 3.0 log PFU/mL in MWW and PB, respectively.

Previous studies have reported that inactivation of viruses can vary significantly between natural waters and reagent grade water (RGW). Researchers have hypothesized that turbidity in complex environmental waters may protect virions from disinfectants[11] via shielding, adsorption, or enhanced aggregation.[49] One study reported that differences in water quality in three source waters influenced chlorine CT values for 3-$\log_{10}$ reduction of viruses that varied between 2.6–7.9 mg-min/L for coxsackievirus B5 (CVB5), 0.6–1.2 mg-min/L for echovirus 11 (E11), and <0.04–0.06 mg-min/L for human adenovirus 2 (HAdV2). However, they reported no correlation between inactivation kinetics and water quality parameters.[50] These same researchers also investigated the effect of source water quality on monochloramine inactivation of viruses and found that water quality did have a significant impact on the inactivation rates of CVB5 (CT values varied between 240 and 320 mg-min/L for 3 $\log_{10}$ reduction, depending on water type), HAdV2 (300–720 mg-min/L), and E11 (550–950 mg-min/L), but not on MNV.[12] These researchers concluded that similar to chlorine, monochloramine inactivation was not consistently enhanced or inhibited in any type of source water.

There is little information in the literature directly comparing PAA inactivation of viruses in RGW and MWW. One previous study compared inactivation of MS2 and poliovirus by PAA in mineralized water before and after the addition of yeast extract to simulate organic loading.[24] These researchers observed similar PAA CT values for 4-$\log_{10}$ reduction of poliovirus (~22 500 mg-min/L) in clean and soiled water, and similar

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972–2981

minimum PAA concentrations necessary to pass a standardized laboratory test requiring 4-$\log_{10}$ reduction of MS2 (~30 mg/L) in both clean and soiled water. These researchers thus concluded that PAA's virucidal efficacy is robust to organic content changes in water. Others have also supported the use of PAA for MWW disinfection by citing the resiliency of PAA disinfection in conditions of varying heterogeneous organic matter.[14] Results from this study demonstrate, however, that water quality does impact both monochloramine and PAA's virucidal efficacy. Specifically, monochloramine and PAA exhibited greater reductions in infectivity for MS2 and MNV in PB than in MWW. While the studies previously cited examined the effect of water quality on virus infectivity reduction in surface water, groundwater, and synthetic water, this study examined the effect in MWW. In the instances where previous studies presented water quality parameters, the turbidity and conductivity measurements were consistently lower than the MWW measurements presented in SI Table S1, presumably due to the complex nature of MWW compared to natural waters. Thus, the increased complexity of MWW compared to natural and synthetic waters may account for the clear trends observed in this study. The high number and varied composition, size, and structure of particles contributing to turbidity in secondary wastewater may shield or adsorb virions and protect them from disinfectants,[51] whereas the effect may be less pronounced in surface water and groundwater.

High ionic strength has been observed to aid in the effectiveness of chlorine-based disinfection.[52,53] While the mechanism is not well understood, researchers have theorized that salt cations may neutralize negatively charged viruses, allowing disinfectants easier access to target sites on the virus capsid. However, in this study both monochloramine and PAA exhibited lower efficacies in MWW that possessed a higher ion content than PB, suggesting that the protective turbidity effect have dominated over the ion effect.

The overall reduced efficacy of monochloramine and PAA in MWW compared to PB for both viruses in this study suggest that disinfection data from studies performed in RGW cannot be extrapolated to MWW. Furthermore, inherent variability in MWW effluents substantiate the need for additional studies to assess virus infectivity reduction in a range of MWW types and conditions.

Infectivity Reduction of MNV Versus MS2 by Study Disinfectants. Concentration−time (CT) plots were developed using integrated residuals after accounting for disinfectant decay (Figure 4). These plots allow for direct comparisons of MNV versus MS2 for a single disinfectant and PAA versus monochloramine for a single virus type. Plots (a) and (b) show that in MWW neither disinfectant could provide a reduction of 1 log PFU/mL for MS2 even at CT values in excess 800 mg-min/L. In contrast, MNV demonstrated over 4 log PFU/mL reduction in MWW at CT values under 100 mg-min/L for both disinfectants.

There are few previous data on inactivation of enteric viruses in MWW by monochloramine. Previous work by Kahler et al. (2011) investigated a suite of viruses in three natural waters and observed CT values for 3-$\log_{10}$ reduction of MNV in all waters to be between 23 to 44 mg-min/L at pH 7 and 15 °C,[12] which is consistent with the present data in MWW. With regards to coliphage, Linden *et. al* (2012) found a 30−40% reduction in MS2 after a monochloramine CT of 120 mg-min/L in a water reclamation facility,[20] which is consistent with the high resistance of MS2 to monochloramine inactivation observed in this study. Further comparisons of virus inactivation by monochloramine from the present study with previous findings was limited due to the paucity of inactivation data in complex water matrices.

There is more information in the literature on PAA inactivation of coliphage in MWW. Three studies performed in enhanced primary effluent,[18] secondary effluent,[19] and tertiary effluent[20] observed less than 1-log reduction of coliphage at PAA CT-values of 180, 30, and 150 mg-min/L, respectively. Another study by Lazarova et al. (1998) observed an approximate 2-log reduction of MS2 after 60 min of contact with a dose of 500 mg/L[22] PAA. Thus, the high resistance of MS2 to PAA inactivation observed in this study is consistent with previous research.

Inactivation studies that have undertaken direct comparisons of MNV and MS2 in other matrices with different disinfectants have consistently shown that MNV is the more labile target.[25,26,54] The mechanisms underlying this variability, though, are not well understood. Although previous studies have demonstrated that exposure to disinfectants results in modifications to viral proteins[55] and nucleic acids,[56] the specific mechanisms that govern viral inactivation are not clear. Even highly similar viruses have been shown to have markedly different responses to the same disinfectants.[57] To complicate matters, researchers have found that three-dimensional protein and nucleic acid structures can impact virus susceptibility in addition to minor variations in the components that comprise the viral capsid and genome.[58,59] In short, a mechanistic understanding of how each virus-disinfectant pair interact is slowly being developed in the literature.

In practice, the susceptibility of MNV to monochloramine and PAA inactivation relative to MS2 indicates that potential future permit limits based on MS2 bacteriophage are likely to be protective for noroviruses. In California, where disinfection of recycled wastewater is governed by Title 22 of the California Code of Regulations, recycled wastewater disinfection requires a CT of 450 mg-min/L with free or combined chlorine in filtered secondary effluent (or alternatively, filtration and disinfection processes together may demonstrate 5-log inactivation of MS2 or poliovirus). However, data presented here demonstrate that a combined chlorine CT of 450 mg-min/L will not achieve more than 1-log inactivation of MS2 in MWW. As utilities search for alternative wastewater disinfection technologies to chloramination in an effort to minimize the formation of halogenated DBPs, virus regulations based on Title 22 may inhibit the adoption of new technologies that are at least as effective as monochloramine, because new technologies must demonstrate a level of MS2 reduction that monochloramine itself cannot achieve.

PAA versus Monochloramine Disinfection Efficacy for MS2 and MNV. As utilities search for alternative disinfectants to reduce halogenated DBP formation during disinfection of MWW, interest in PAA has grown.[14] To-date there are limited data directly comparing the virucidal effectiveness of PAA to more common disinfectants. This study compared the effectiveness of PAA and monochloramine in reducing infectivity of MS2 and MNV in MWW. Plots (c) and (d) in Figure 4 show direct comparisons of PAA and monochloramine inactivation of MS2 and MNV in MWW, respectively. PAA and monochloramine residual decay, shown in Figures 1 and 2, was accounted for in the calculation of integrated CT values.

In Figure 4, plot (c) demonstrates that PAA and monochloramine have similar efficacy on MS2 infectivity reduction in

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

MWW. Neither disinfectant was able to achieve more than 1-log reduction of MS2 at CT values up to 800 mg-min/L. In contrast, plot (d) demonstrates that monochloramine was more effective in inactivating MNV than PAA. At a CT value of approximately 20 mg-min/L monochloramine achieved approximately 2.5-log reduction of MNV while PAA only achieved approximately 1-log reduction. At a CT value of 40 mg-min/L the difference in the effectiveness of the two disinfectants was less pronounced, with monochloramine achieving approximately 3-log reduction of MNV, whereas PAA achieved approximately 2-log reduction.

Direct comparisons of PAA and alternative disinfectants for the reduction of viruses in MWW have previously been performed. In one MWW pilot plant study, PAA and chlorine dioxide were both found to achieve less than 0.5-log reduction of somatic and F-positive RNA bacteriophages at CT values of 30 mg-min/L and 40 mg-min/L, respectively.[60] Other studies have demonstrated that ozone[18] and free chlorine[61] are more effective virucides than PAA in MWW. However, these studies focused primarily on disinfectant efficacy against coliphage. Our data demonstrate the importance of evaluating disinfectants across multiple viruses so that variability in effectiveness across targets can be observed.

In the present study, PAA was evaluated in comparison with monochloramine for reduction of two model viruses in MWW. Both disinfectants performed similarly against MS2 and are consistent with published data in demonstrating the resistance of this virus to inactivation by monochloramine and PAA. With respect to MNV, monochloramine exhibited slightly higher efficacy than PAA. However, both disinfectants were able to achieve approximately 4-log reduction of MNV at CT values of under 100 mg-min/L. Thus, the data affirm PAA as a viable alternative to monochloramine for virus infectivity reduction in MWW. However, further research is needed to assess variation in the efficacy of PAA and monochloramine across additional types of viruses in MWW relevant for public health.

Practical Implications. Model predicted CT values for 1-, 2-, 3-, and 4-log reduction of selected organisms in MWW are presented in Table 2. The CT values provided for MS2 were based on 10 mg/L initial doses because 1-log inactivation in MWW was not observed with lower doses over the disinfectant exposure time period in this study. CT values for MNV are average model predicted CT values from the doses employed in this study.

The 1-log CT values for MS2 reduction by monochloramine and PAA are 1228 and 1254 mg-min/L, respectively. However, CT values for MNV reduction are much lower, with 4-log infectivity reduction achieved at CT's under 100 mg-min/L for both disinfectants. This indicates that potential future regulations and WWTP practices derived from MS2 inactivation data may overestimate CT values for reduction of MNV and may lead to unnecessary costs and excessive disinfection byproduct formation.

E. coli data in Table 2 were taken from pilot studies performed by the Metro Wastewater Reclamation District (Denver, CO) using the same municipal wastewater used in this study. These data demonstrate that operational CT values for WWTP disinfection processes to achieve 3-log bacterial reduction, around 30 mg-min/L, are sufficient to achieve predicted MNV reductions of over 3-logs using monochloramine and nearly 1-log using PAA.

Table 2. Model Predicted CT Values Required for 1-, 2-, 3-, and 4-log_{10} Reduction of Selected Organisms by NH_2Cl and PAA in Municipal Wastewater[a]

		CT value (mg-min/L)		
reduction	disinfectant	MS2	MNV	*E.coli*[b]
1-log_{10}	NH_2Cl	1228	6	10
	PAA	1254	32	8
2-log_{10}	NH_2Cl	N.O.	13	22
	PAA	N.O.	47	21
3-log_{10}	NH_2Cl	N.O.	28	30
	PAA	N.O.	69	31
4-log_{10}	NH_2Cl	N.O.	<80[c]	N.O.
	PAA	N.O.	<95[c]	N.O.

[a]N.O.: Specified log_{10} viral infectivity reductions not observed over time-course of experiments. [b]Data empirically observed from pilot study conducted at same municipal wastewater plant from which water was collected for this study. [c]No virus were detected at specified CT. Values were determined using the lower sensitivity limit of viral assay.

■ ASSOCIATED CONTENT

Supporting Information

The Supporting Information is available free of charge on the ACS Publications website at DOI: 10.1021/acs.est.6b05529.

Table S1. Water quality parameters for secondary wastewater effluent sample. Figure S1. Dynamic light scattering results for MS2 bacteriophage stocks after Amicon filtration. Table S2. Summary of model parameters for each virus, water type, and disinfectant scenario. Table S3 Summary of model error statistics with Shapiro Wilk test for normality (PDF)

■ AUTHOR INFORMATION

Corresponding Author

*E-mail: joseph.jacangelo@stantec.com.

ORCID

Nathan Dunkin: 0000-0002-3786-051X

Notes

The authors declare no competing financial interest.

■ ACKNOWLEDGMENTS

This work was supported by the Metro Wastewater Reclamation District in Denver, CO (Jim McQuarrie, Edyta-Stec-Uddin, and Bradley Van Anderson), the National Science Foundation Graduate Research Fellowship Program (award ID# DGE-1232825), the JHU/MWH-Stantec Alliance, the Johns Hopkins Water Institute, and the Osprey Foundation of Maryland. Thanks are given to Dr. Philip Block of PeroxyChem and Dr. Allegra de Silva of MWH (now part of Stantec) for their review of the manuscript; Dr. Charles Haas of Drexel University for his assistance with kinetic modeling; and Caroline Coulter and Krista Liguori of JHU for technical laboratory support.

■ REFERENCES

(1) USEPA. *Review of Coliphages as Possible Indicators of Fecal Contamination for Ambient Water Quality*, 820-R-15−098, 2015.

(2) Krasner, S. W.; Westerhoff, P.; Chen, B. Y.; Rittmann, B. E.; Amy, G. Occurrence of Disinfection Byproducts in United States Wastewater Treatment Plant Effluents. *Environ. Sci. Technol.* **2009**, 43 (21), 8320−8325.

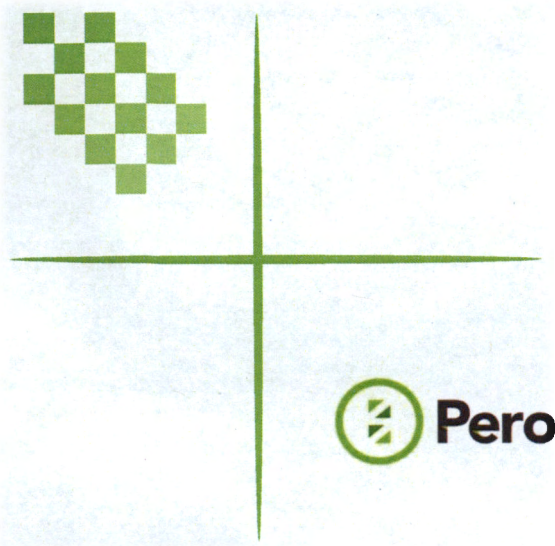
DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

(3) Yang, X.; Shang, C.; Westerhoff, P. Factors affecting formation of haloacetonitriles, haloketones, chloropicrin and cyanogen halides during chloramination. *Water Res.* **2007**, *41* (6), 1193−1200.
(4) Cowman, G. A.; Singer, P. C. Effect of bromide ion on haloacetic acid speciation resulting from chlorination and chloramination of aquatic humic substances. *Environ. Sci. Technol.* **1996**, *30* (1), 16−24.
(5) Krasner, S. W.; McGuire, M. J.; Jacangelo, J. G.; Patania, N. L.; Reagan, K. M.; Marco Aieta, E. Occurrence of disinfection by-products in US drinking water. *Journal/American Water Works Association* **1989**, *81* (8), 41−53.
(6) Baxter, C. S.; Hofmann, R.; Templeton, M. R.; Brown, M.; Andrews, R. C. Inactivation of adenovirus types 2, 5, and 41 in drinking water by UV light, free chlorine, and monochloramine. *J. Environ. Eng.* **2007**, *133* (1), 95−103.
(7) Cromeans, T. L.; Kahler, A. M.; Hill, V. R. Inactivation of adenoviruses, enteroviruses, and murine norovirus in water by free chlorine and monochloramine. *Applied and environmental microbiology* **2010**, *76* (4), 1028−1033.
(8) Sirikanchana, K.; Shisler, J. L.; Marinas, B. J. Inactivation kinetics of adenovirus serotype 2 with monochloramine. *Water Res.* **2008**, *42* (6−7), 1467−1474.
(9) Sobsey, M. D.; Fuji, T.; Hall, R. M. Inactivation of Cell-Associated and Dispersed Hepatitis-a Virus in Water. *J. Am. Water Works Ass* **1991**, *83* (11), 64−67.
(10) Sobsey, M. D.; Fuji, T.; Shields, P. A. Inactivation of Hepatitis-a Virus and Model Viruses in Water by Free Chlorine and Monochloramine. *Water Sci. Technol.* **1988**, *20* (11−12), 385−391.
(11) Haas, C. N.; Joffe, J.; Jacangelo, J. G.; Anmangandla, U.; Heath, M. Water quality and disinfection kinetics. *American Water Works Association. Journal* **1996**, *88* (3), 95.
(12) Kahler, A. M.; Cromeans, T. L.; Roberts, J. M.; Hill, V. R. Source water quality effects on monochloramine inactivation of adenovirus, coxsackievirus, echovirus, and murine norovirus. *Water Res.* **2011**, *45* (4), 1745−1751.
(13) Watson, K.; Shaw, G.; Leusch, F. D. L.; Knight, N. L. Chlorine disinfection by-products in wastewater effluent: Bioassay-based assessment of toxicological impact. *Water Res.* **2012**, *46* (18), 6069−6083.
(14) Kitis, M. Disinfection of wastewater with peracetic acid: a review. *Environ. Int.* **2004**, *30* (1), 47−55.
(15) Monarca, S.; Richardso, S. D.; Feretti, D.; Grottolo, M.; Thruston, A. D.; Zani, C.; Navazio, G.; Ragazzo, P.; Zerbini, I.; Alberti, A. Mutagenicity and disinfection by-products in surface drinking water disinfected with peracetic acid. *Environ. Toxicol. Chem.* **2002**, *21* (2), 309−318.
(16) Crebelli, R.; Conti, L.; Monarca, S.; Feretti, D.; Zerbini, I.; Zani, C.; Veschetti, E.; Cutilli, D.; Ottaviani, M. Genotoxicity of the disinfection by-products resulting from peracetic acid- or hypochlorite-disinfected sewage wastewater. *Water Res.* **2005**, *39* (6), 1105−1113.
(17) Rossi, S.; Antonelli, M.; Mezzanotte, V.; Nurizzo, C. Peracetic acid disinfection: A feasible alternative to wastewater chlorination. *Water Environ. Res.* **2007**, *79* (4), 341−350.
(18) Gehr, R.; Wagner, M.; Veerasubramanian, P.; Payment, P. Disinfection efficiency of peracetic acid, UV and ozone after enhanced primary treatment of municipal wastewater. *Water Res.* **2003**, *37* (19), 4573−4586.
(19) Zanetti, F.; De Luca, G.; Sacchetti, R.; Stampi, S. Disinfection efficiency of peracetic acid (PAA): inactivation of coliphages and bacterial indicators in a municipal wastewater plant. *Environ. Technol.* **2007**, *28* (11), 1265−1271.
(20) Linden, K. G.; Salveson, A.; Thurston, J. *Study of Innovative Treatments for Reclaimed Water*; Water Research Foundation, 2012.
(21) Freese, S.; Nozaic, D.; Bailey, I.; Trollip, D. Alternative disinfectants for wastewater effluents: viable or prohibitively expensive? *Water S. A* **2002**, *29*, 23−32.
(22) Lazarova, V.; Janex, M.; Fiksdal, L.; Oberg, C.; Barcina, I.; Pommepuy, M. Advanced wastewater disinfection technologies: short and long term efficiency. *Water Sci. Technol.* **1998**, *38* (12), 109−117.
(23) Rajala-Mustonen, R.; Toivola, P.; Heinonen-Tanski, H. Effects of peracetic acid and UV irradiation on the inactivation of coliphages in wastewater. *Water Sci. Technol.* **1997**, *35* (11), 237−241.
(24) Baldry, M.; French, M.; Slater, D. The activity of peracetic acid on sewage indicator bacteria and viruses. *Water Sci. Technol.* **1991**, *24* (2), 353−357.
(25) Park, G. W.; Sobsey, M. D. Simultaneous Comparison of Murine Norovirus, Feline Calicivirus, Coliphage MS2, and GII.4 Norovirus to Evaluate the Efficacy of Sodium Hypochlorite Against Human Norovirus on a Fecally Soiled Stainless Steel Surface. *Foodborne Pathog. Dis.* **2011**, *8* (9), 1005−1010.
(26) D'Souza, D. H.; Su, X. Efficacy of chemical treatments against murine norovirus, feline calicivirus, and MS2 bacteriophage. *Foodborne Pathog. Dis.* **2010**, *7* (3), 319−26.
(27) Ahmed, S. M.; Hall, A. J.; Robinson, A. E.; Verhoef, L.; Premkumar, P.; Parashar, U. D.; Koopmans, M.; Lopman, B. A. Global prevalence of norovirus in cases of gastroenteritis: a systematic review and meta-analysis. *Lancet Infect. Dis.* **2014**, *14*, 725.
(28) Lopman, B. A.; Hall, A. J.; Curns, A. T.; Parashar, U. D. Increasing rates of gastroenteritis hospital discharges in US adults and the contribution of norovirus, 1996−2007. *Clin. Infect. Dis.* **2011**, *52* (4), 466−74.
(29) Ettayebi, K.; Crawford, S. E.; Murakami, K.; Broughman, J. R.; Karandikar, U.; Tenge, V. R.; Neill, F. H.; Blutt, S. E.; Zeng, X.-L.; Qu, L. Replication of human noroviruses in stem cell−derived human enteroids. *Science* **2016**, *353* (6306), 1387−1393.
(30) Wobus, C. E.; Karst, S. M.; Thackray, L. B.; Chang, K. O.; Sosnovtsev, S. V.; Belliot, G.; Krug, A.; Mackenzie, J. M.; Green, K. Y.; Virgin, H. W. Replication of Norovirus in cell culture reveals a tropism for dendritic cells and macrophages. *PLoS Biol.* **2004**, *2* (12), e432.
(31) Karst, S. M.; Wobus, C. E.; Goodfellow, I. G.; Green, K. Y.; Virgin, H. W. Advances in Norovirus Biology. *Cell Host Microbe* **2014**, *15* (6), 668−680.
(32) Wobus, C. E.; Thackray, L. B.; Virgin, H. W. t. Murine norovirus: a model system to study norovirus biology and pathogenesis. *Journal of virology* **2006**, *80* (11), 5104−12.
(33) Kniel, K. E. The makings of a good human norovirus surrogate. *Curr. Opin. Virol.* **2014**, *4*, 85−90.
(34) Hirneisen, K. A.; Kniel, K. E. Comparing human norovirus surrogates: murine norovirus and Tulane virus. *J. Food Prot.* **2013**, *76* (1), 139−43.
(35) Fisman, D. N.; Greer, A. L.; Brouhanski, G.; Drews, S. J. Of gastro and the gold standard: evaluation and policy implications of norovirus test performance for outbreak detection. *J. Transl. Med.* **2009**, *7* (1), 1.
(36) Weng, S.; Luo, Y.; Li, J.; Zhou, B.; Jacangelo, J. G.; Schwab, K. J. Assessment and speciation of chlorine demand in fresh-cut produce wash water. *Food Control* **2016**, *60*, 543−551.
(37) Bae, J.; Schwab, K. J. Evaluation of murine norovirus, feline calicivirus, poliovirus, and MS2 as surrogates for human norovirus in a model of viral persistence in surface water and groundwater. *Applied and environmental microbiology* **2008**, *74* (2), 477−84.
(38) Hwang, S.; Alhatlani, B.; Arias, A.; Caddy, S. L.; Christodoulou, C.; Cunha, J. B.; Emmott, E.; Gonzalez-Hernandez, M.; Kolawole, A.; Lu, J.; Rippinger, C.; Sorgeloos, F.; Thorne, L.; Vashist, S.; Goodfellow, I.; Wobus, C. E. Murine norovirus: propagation, quantification, and genetic manipulation. *Curr. Protoc Microbiol* **2014**, *33* (15K 2), 1−61.
(39) Adams, M. D. *Bacteriophages*; Interscience Publishers, Inc.: New York, 1959.
(40) Dell'Erba, A.; Falsanisi, D.; Liberti, L.; Notarnicola, M.; Santoro, D. Desalination Strategies in South Mediterranean CountriesDisinfecting behaviour of peracetic acid for municipal wastewater reuse. *Desalination* **2004**, *168*, 435−442.
(41) Harp, D. L. *Current Technology of Chlorine Analysis for Water and Wastewater*; Hach Company, 1995.
(42) Klassen, N. V.; Marchington, D.; McGowan, H. C. E. H2O2 Determination by the I3- Method and by KMnO4 Titration. *Anal. Chem.* **1994**, *66* (18), 2921−2925.

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981

(43) Shang, C.; Blatchley, E. R. Differentiation and Quantification of Free Chlorine and Inorganic Chloramines in Aqueous Solution by MIMS. *Environ. Sci. Technol.* **1999**, *33* (13), 2218−2223.
(44) APHA-AWWA-WEF. *Standard Methods for the Examination of Water and Wastewater*, 22th ed.; Washington. DC., 2012.
(45) Watson, H. E. A note on the variation of the rate of disinfection with change in the concentration of the disinfectant. *J. Hyg.* **1908**, *8* (04), 536−542.
(46) Haas, C. N.; Joffe, J. Disinfection under Dynamic Conditions: Modification of Hom's Model for Decay. *Environ. Sci. Technol.* **1994**, *28* (7), 1367−9.
(47) Haas, C. N.; Joffe, J.; Anmangandla, U.; Hornberger, J.; Heath, M.; Glicker, J., Development and validation of rational design methods of disinfection. In *Development and Validation of Rational Design Methods of Disinfection*, AWWAR, **1995**.
(48) Anotai, J. *Effect of Calcium Ion on Chemistry and Disinfection Efficiency of Free Chlorine at pH 10*; Drexel University, 1996.
(49) Thurston-Enriquez, J. A.; Haas, C. N.; Jacangelo, J.; Gerba, C. P. Chlorine inactivation of adenovirus type 40 and feline calicivirus. *Applied and environmental microbiology* **2003**, *69* (7), 3979−85.
(50) Kahler, A. M.; Cromeans, T. L.; Roberts, J. M.; Hill, V. R. Effects of source water quality on chlorine inactivation of adenovirus, coxsackievirus, echovirus, and murine norovirus. *Applied and environmental microbiology* **2010**, *76* (15), 5159−64.
(51) Templeton, M. R.; Andrews, R. C.; Hofmann, R. Particle-associated viruses in water: Impacts on disinfection processes. *Crit. Rev. Environ. Sci. Technol.* **2008**, *38* (3), 137−164.
(52) Berg, G.; Sanjaghsaz, H.; Wangwongwatana, S. Potentiation of the Poliocidal Effectiveness of Free Chlorine by a Buffer. *J. Virol. Methods* **1989**, *23* (2), 179−186.
(53) Berg, G.; Sanjaghsaz, H.; Wangwongwatana, S. KCl potentiation of the virucidal effectiveness of free chlorine at pH 9.0. *Applied and Environmental Microbiology* **1990**, *56* (6), 1571−1575.
(54) Baert, L.; Vandekinderen, I.; Devlieghere, F.; Van Coillie, E.; Debevere, J.; Uyttendaele, M. Inactivation of murine norovirus 1 and Bacteroides fragilis infecting phage B40−8 by the use of sodium hypochlorite and peroxyacetic acid as decontaminating agents for shredded iceberg lettuce. *Communications in Agricultural and Applied Biological Sciences* **2008**, *73* (1), 97−101.
(55) Sano, D.; Pinto, R. M.; Omura, T.; Bosch, A. Detection of Oxidative Damages on Viral Capsid Protein for Evaluating Structural Integrity and Infectivity of Human Norovirus. *Environ. Sci. Technol.* **2010**, *44* (2), 808−812.
(56) Nuanualsuwan, S.; Cliver, D. O. Capsid functions of inactivated human picornaviruses and feline calicivirus. *Applied and environmental microbiology* **2003**, *69* (1), 350−357.
(57) Wigginton, K. R.; Pecson, B. M.; Sigstam, T. r.; Bosshard, F.; Kohn, T. Virus inactivation mechanisms: impact of disinfectants on virus function and structural integrity. *Environ. Sci. Technol.* **2012**, *46* (21), 12069−12078.
(58) Simonet, J.; Gantzer, C. Degradation of the Poliovirus 1 genome by chlorine dioxide. *J. Appl. Microbiol.* **2006**, *100* (4), 862−870.
(59) Choe, J. K.; Richards, D. H.; Wilson, C. J.; Mitch, W. A. Degradation of Amino Acids and Structure in Model Proteins and Bacteriophage MS2 by Chlorine, Bromine, and Ozone. *Environ. Sci. Technol.* **2015**, *49* (22), 13331−13339.
(60) De Luca, G.; Sacchetti, R.; Zanetti, F.; Leoni, E. Comparative Study on the Efficiency of Peracetic Acid and Chlorine Dioxide at Low Doses in the Disinfection of Urban Wastewaters. *Ann. Agr Env Med.* **2008**, *15* (2), 217−224.
(61) Veschetti, E.; Cutilli, D.; Bonadonna, L.; Briancesco, R.; Martini, C.; Cecchini, G.; Anastasi, P.; Ottaviani, M. Pilot-plant comparative study of peracetic acid and sodium hypochlorite wastewater disinfection. *Water Res.* **2003**, *37* (1), 78−94.

DOI: 10.1021/acs.est.6b05529
Environ. Sci. Technol. 2017, 51, 2972−2981



Final Report

Data Summary Report for VigorOx® WWT II Disinfection Trial for

Oxford
Tull C. Allen WWTP

PeroxyChem

Munford, AL

November 15, 2017

PeroxyChem

Executive Summary

VigorOx® WWT II peracetic acid (PAA) was trialed at the Tull C. Allen wastewater treatment plant, located in Munford, AL from April 22nd, 2014 through August 8, 2014. PAA was shown to provide effective bacterial reduction of total coliforms to below the target permit requirements, at PAA doses as low as 1.2 mg PAA / L at a contact times indicative of typical plant flow conditions.

Key findings from the trial include:

- During the trial, under the PAA dose conditions tested, total coliform effluent concentrations did not exceed summer maximum daily allowed concentrations.
- Under the PAA dose concentrations tested, average monthly total coliform effluent concentrations did not exceed allowed concentrations, and that the PAA monthly averages were lower than that for chlorine-treated wastewater.
- PAA residuals did not exceed 0.5 mg / L during the trial, and as a result, no impact on aquatic life downstream is expected.

Philip Block

Philip Block, PhD
Technical Director – Water Treatment

PeroxyChem

I. Introduction

1.1 Objectives

A full-scale disinfection trial was conducted at the Tull C. Allen Wastewater Treatment Plant, located in Munford, AL from April through August, 2014. The objectives of this trial were:

- To confirm the effectiveness of VigorOx® WWT II peracetic acid (PAA) to achieve compliance with the wastewater discharge permit disinfection criteria for total coliforms.
- To compare the performance of VigorOx WWT II PAA to chlorine disinfection in a side-by-side trial.

The total coliform disinfection goals for this study was a reduction in microbial concentration to below a summer monthly average of 126 # / 100 mL and a daily maximum of 487 # / 100 mL.

1.2 VigorOx® WWT II Peracetic Acid

VigorOx WWT II is a strong disinfectant that results from the equilibrium reaction between acetic acid (vinegar) and hydrogen peroxide (H_2O_2). The resulting solution contains 15% peracetic acid (PAA) and 23% hydrogen peroxide (see Figure 1 for the chemical structure). The PAA molecule attacks and kills microbial organisms of concern in wastewater treatment, such as fecal coliforms and *E. coli* by disruption of cell membranes.

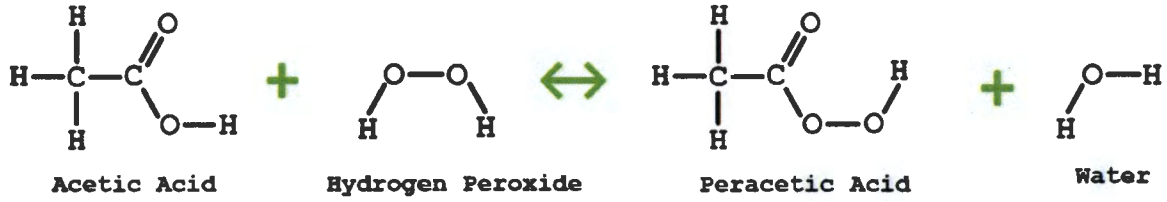


Figure 1 PAA Equilibrium

The oxidation potential of PAA is greater than that of hypochlorous acid, hypochlorite ion and monochloramine (shown in Table 1), resulting in typically lower dosages and contact times as compared to using chlorine or chloramines. In addition, PAA has a much lower aquatic toxicity profile

than chlorine and decays rapidly in the environment. As a result, PAA generally does not need a quenching step, such as dechlorination, reducing process complexity and cost. PAA is not a chlorine-based chemistry and does not result in the formation of chlorinated disinfection by-products such as cyanide, n-Nitrosodimethylamine (NDMA) and trihalomethanes (THMs).

Table 1 Standard Oxidation Potential

Oxidant	Standard Potential (V)
PAA (CH_3COOOH)	1.81
Hypochlorous Acid (HOCl)	1.48
Monochloramine (NH_2Cl)	1.40
Hypochlorite Ion (OCl^-)	0.81

2. Trial Plan

A full-scale trial was performed with VigorOx WWT II PAA from April 22nd, 2014 through August 8, 2014 at the Tull C. Allen wastewater treatment plant in Munford, AL. The wastewater was split into two identical disinfection channels, one side being treated with the current plant disinfection method, sodium hypochlorite. The PAA was dosed into the second channel, using a flow-paced dosing skid to maintain a PAA application dose in the range of 1.2 – 1.7 mg PAA / L. The PAA was initiated at 1.7 mg/L and was gradually decreased to 1.3 during the test as a result of the bacterial limits being surpassed.

The wastewater treatment plant has an average daily flow of 2.5 MGD, a typical peak flow of 4.0 MGD and a permitted maximum flowrate of 4.5 MGD. The typical contact time for disinfection under these conditions is 40 – 50 minutes. The compliance monitoring point is 100 ft beyond the contact basin at the end of a cascading outflow.

Effluent coliform measurements were performed by plant staff per plant standard operating procedure. PAA residual was measured using standard PAA test methods incorporating a single analyte measuring device.

3. Results and Discussions

3.1 Disinfection Performance against Total Coliforms

The disinfection performance against total coliforms during the trial is shown in Figure 2, after treatment with PAA and chlorine.

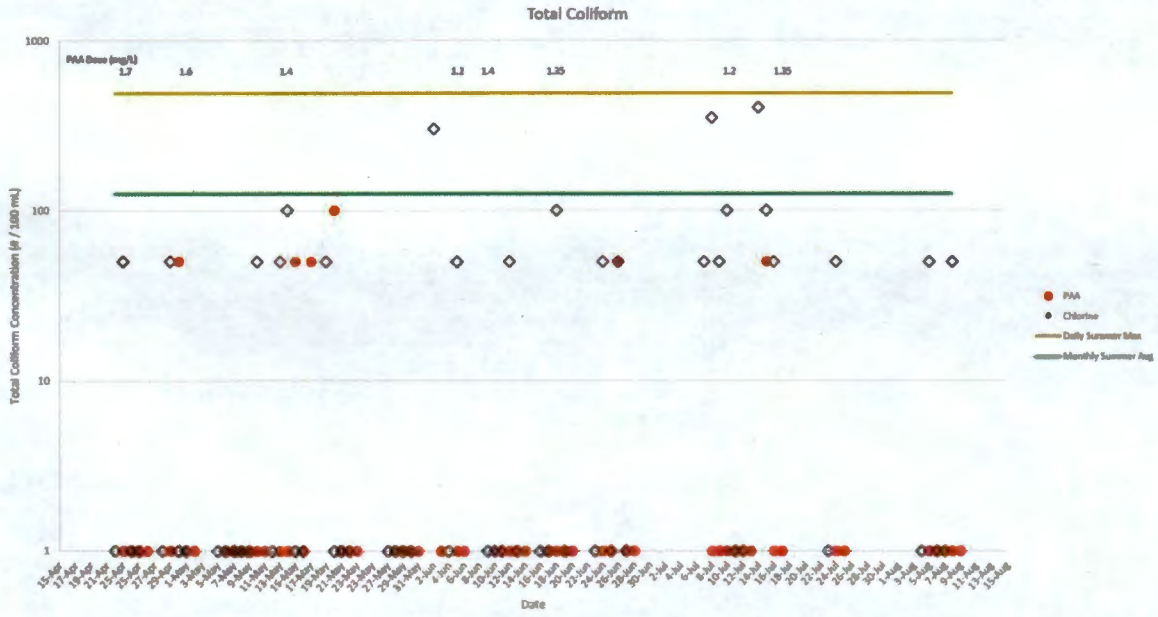


Figure 2 Total Coliform Effluent Concentrations after Treatment with PAA and Chlorine

From Figure 2, it is noted that the total coliform effluent concentration did not exceed the single day maximum (487 # / 100 mL) for the wastewater treated with PAA. Table 2 shows the monthly average coliform concentrations during the trial for both PAA and chlorine treatments.

Table 2 Statistical Summary of *Monthly Total Coliform Effluent Concentrations*

Total Coliform	Monthly Average				
(# / 100 mL)	April	May	June	July	August[2]
PAA	7	10	3	5	0
Chlorine	14	13	35	105	13

1 – this average is from April 22 – 30
2 – this average is from August 1 – 8

As seen in Table 2, the monthly average coliform effluent concentrations did not exceed the permit level of 126 # / 100 mL for either the PAA treated wastewater or for the chlorine treated wastewater. However, it is observed that in general, the PAA treated wastewater had lower monthly coliform concentrations than that of the chlorine treated wastewater, under the PAA dose concentrations tested during the trial.

3.3 Peracetic Acid Residuals

PAA residuals in the effluent ranged from non-detect to a maximum of 0.5 mg PAA / L during the trial. This is well below the US EPA labelled maximum of 1.0 mg / L.

As a result, it is expected that under PAA dose concentrations that were shown to be effective in reducing total coliform concentrations to below permitted values, the PAA residual at the compliance monitoring point will not be impactful to downstream aquatic life.

4 Conclusions

VigorOx® WWT II peracetic acid (PAA) was shown to provide effective bacterial reduction during field pilot trialing at the Tull C. Allen wastewater treatment plant, located in Munford, AL. Reduction of total coliforms to below the target permit requirements was achievable at PAA doses tested during the trial for as low as 1.2 mg PAA / L at a contact times indicative of typical plant flow conditions.

Key findings from the trial include:

- During the trial, under the PAA dose conditions tested, total coliform effluent concentrations did not exceed summer maximum daily allowed concentrations.

- Under the PAA dose concentrations tested, average monthly total coliform effluent concentrations did not exceed allowed concentrations, and that the PAA monthly averages were lower than that for chlorine-treated wastewater.

- PAA residuals did not exceed 0.5 mg / L during the trial, and as a result, no impact on aquatic life downstream is expected.

VigorOx® WWT II
Wastewater Disinfection Technology

Summary Report

Determination of Performance Equivalency between Chlorine and VigorOx® WWT II in Disinfection of Wastewater

Summary Report, April 22nd 2014

I. INTRODUCTION

This document provides a summary of the results obtained from the equivalency testing on virus inactivation between VigorOx WWT II and chlorine. The disinfection equivalency testing was requested by the Ontario Ministry of Environment (MOE) to consider approval of the use of VigorOx WWT II as primary disinfectant at the Valley East WWTP in Sudbury, ON. The test was performed per the protocol previously approved by the MOE.

II. TESTING CONDITIONS

The test was conducted by MicroBio Test (Sterling, VA) in two phases. Pertinent details of each of the phases are summarized in Table 1.

Table 1. Testing Matrix

Study	Batch Quantity	Disinfectant Used & Doses		Contact Time (hours)	Microbes Tested
		VigorOx WWT II (ppm as PAA)	NaOCl (ppm as Cl_2)		
Phase #1[a]	4	1.5 and 2.5	1.6	0.5, 1, 6 and 13	E coli and Coxsackievirus B6
Phase #2[b]	2	3.5 and 4.5	1.6	0.5, 1.6 and 13	Coxsackievirus B6

a: "Second Amended Final Report (replaces the final report issued on 1/22/2013), Microbiocidal and Virucidal Efficacy Evaluation of Wastewater Treatment Products against E. coli and Coxsackievirus.", MicroBio Test

b: "Amended Final Report (replaces the final report issues on 2/6/2014), Virucidal Efficacy Evaluation of Wastewater Treatment Products against Coxsackievirus", MicroBio Test

In the Study Phase #1, four batches of un-disinfected secondary effluents from the Valley East WWTP were shipped to MicroBio during the months of September and October, 2013. Bench scale disinfection tests against E coli and Coxsackievirus B6 were performed for two VigorOx® WWT II doses (1.5 ppm and 2.5 ppm as PAA) and one hypochlorite dose (1.6 ppm as Cl_2). Contact time used include 0.5, 1, 6 and 13 hours. 0.5 and 13.0 hrs of contact time represent the average residence time at the plant's disinfection contact tank and the outflow pipe respectively. Contact times of 1 and 6 hours were included in the study for additional information.

Based on the results of Phase #1, a second study (Phase #2) was commissioned to evaluate the efficacy of PAA at higher concentrations. In the second study, two batches of un-disinfected secondary effluents from the Valley East WWTP were shipped to MicroBio in December 2013. Bench scale disinfection tests against Coxsackievirus B6 were performed for two VigorOx® WWT II doses (3.5 ppm and 4.5 ppm as PAA) and one hypochlorite dose (1.6 ppm as Cl_2). Disinfection test against E coli was not performed in the Phase #2 Study since results from the Phase #1 had already shown complete inactivation against E coli (see Results and Discussions section below) at VigorOx WWT II doses of 1.5 and 2.5 ppm and at hypochlorite dose of 1.6 ppm.

In Phase #2, results for two ammonia conditions were documented. Ammonia condition #1 is similar to the Phase #1; the samples were tested as-is (without adding any ammonia). For ammonia condition #2, ammonia concentrations were adjusted to 33 mg/L (ammonia as nitrogen). Ammonia condition #2 was included in the Study for additional research purpose by PeroxyChem. Testing with ammonia condition #2 was not described in the original protocol approved by MOE, and the corresponding results included in the Phase #2 Report were for information only and not part of the data set upon which the final conclusions are drawn. For detailed information, please refer to the test protocol and Phase 1 and Phase 2 Study reports from MicroBio attached.

III. STATISTICAL METHODS

The Hypothesis Test statistical method was employed to assess whether the data set from the VigorOx® WWT II peracetic acid treatment of Coxsakievirus is equivalent to the data set from the sodium hypochlorite treatment of the same pathogen. The null hypothesis is that these two data sets are equivalent.

Generally, a significance level, α, is set to as the probability of rejecting the null hypothesis, or determining that the hypochlorite and the peracetic acid results are not equivalent. The confidence level then set as $1 - \alpha$. As an example, with an $\alpha = 0.05$, the confidence interval would be 95% ($1 - 0.05 = 0.95$). As the confidence level increases, the interval where the next data point is expected to fall increases in width around the mean of the data set (Figure 1).

The p-value is the probability of obtaining a result that is more extreme then obtaining a result if the null hypothesis was true. In other words, the p-value is the probability of obtaining a result showing that the effect of VigorOx WWT II peracetic acid is different than the effect of hypochlorite on Coxsackievirus. In general, if the p-value > α, then the probability of peracetic acid and hypochlorite achieving equivalent Coxdackievirus reduction is high. If the p-value < α, then there is a high probability that VigorOx WWT II and hypochlorite will not achieve equivalent results. Graphically, the p-value is the probability that the data will fall outside of the confidence interval within the distribution above.

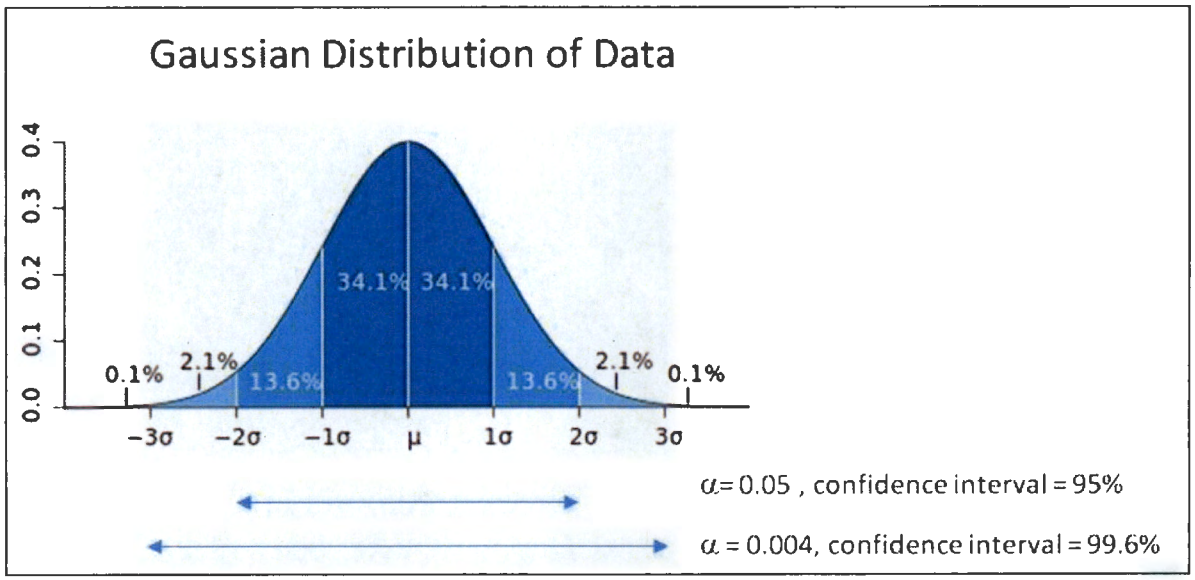


Figure 1. Significance level decreases as confidence interval increases.

What may be counter-intuitive here is that the more confidence needed in the test conclusions, the wider the interval of conditions where the hypothesis is true. Increasing the interval in turn reduces the probability of obtaining a p-value < α (the broader the confidence interval, the less likely it is null hypothesis will be invalidated). As shown below, equivalency between VigorOx WWTII and sodium hypochlorite can be proven for a wider set of conditions (dose and contact time) as the confidence level increases from 95 to 99.5%

IV. RESULTS

E *coli* Inactivation

E coli concentrations of 10^5 to 10^6 CFU/100mL were spiked into four batches of wastewater sample in Phase #1 study. The measured *E coli* counts under all dose conditions at various contact times were shown in Tables 5 to 8 in Phase #1 Report. The results indicated that *E. coli* were reduced to below detection limit (which is 10 CFU/100mL) under all test conditions. The corresponding reductions were 4.50 log (99.997%) or higher (shown in Table 10 in Phase #1 Report).

P values were calculated based on the geometric mean log reductions of all four samples for each test condition. The results for contact time of 0.5 hours and 13 hours were shown in Table 12 in Phase #1 Report. The results indicated that, when using E. coli as indicator organism, a dose of 1.5 ppm of VigorOx® WWT II (as PAA) is equivalent to the current 1.6 ppm dose of NaClO (as Cl2) at the three confidence levels (95%, 99% and 99.5%).

Virus Inactivation

Coxsackievirus concentrations of 105 to 106 organism/100 mL were spiked into the each batch of wastewater sample (four batches in Phase #1 and two batches in Phase #2). For each test condition, the geometric mean and standard deviation of Coxsackievirus counts were calculated (shown in Tables 1 to 4 in Phase #1 Report and Table 1 in Phase #2 Report). The corresponding log reduction for each batch sample under each test condition was calculated (shown in Table 10 in Phase #1 Report and Table 3 in Phase #2 Report).

P values were calculated based on the geometric mean log reductions of all batches of samples for each test condition. The results for contact time of 0.5 hours and 13 hours were shown in Table 11 in Phase #1 Report and Table 4 in Phase #2 Report. The results of the virus inactivation study, including log reduction and p value, are summarized in Table 2 below.

Table 2. Virus Reduction Equivalency between Chlorine and VigorOx WWTII

Treatment	Dose (ppm)	Contact Time (hr)	Log Reduction							Confidence Level		
			Batch1	Batch2	Batch3	Batch4	Avg	StdDev	p-value	95%	99%	99.5%
										Equivalent to Chlorine?		
VigorOx	1.5	0.5	0.4	1.1	0.4	1.6	0.9	0.56	0.27	YES	YES	YES
		13	1.1	1.8	1.3	2.1	1.6	0.48	0.01	NO	YES	YES
VigorOx	2.5	0.5	1.8	1.1	0.6	1.3	1.2	0.50	0.46	YES	YES	YES
		13	2.7	2.1	1.8	2.0	2.2	0.40	0.01	NO	YES	YES
NaClO	1.6	0.5	1.8	1.8	0.8	1.1	1.4	0.46				
		13	3.7	3.8	3.7	3.3	3.6	0.23				
VigorOx	3.5	0.5	1.2	1.4			1.3	0.11	0.18	YES	YES	YES
		13	2.8	3.2			3.0	0.27	0.09	YES	YES	YES
VigorOx	4.5	0.5	1.6	1.2			1.4	0.27	0.05	YES	YES	YES
		13	3.7	3.7			3.7	0.01	0.64	YES	YES	YES
NaClO	1.6	0.5	0.8	0.5			0.6	0.18				
		13	3.6	4.3			4.0	0.46				

V. DISCUSSION

Phase #1 Results

Selecting a 95% confidence level, the hypothesis test results indicate that (a) at contact time of 0.5 hours, VigorOx WWT II doses of 1.5 ppm and 2.5 ppm (as PAA) exhibited similar inactivation efficacy against Coxsackievirus B6 when compared to sodium hypochlorite of 1.6 ppm (as Cl_2); and (b) at contact time of 13 hours, VigorOx WWT II doses of 1.5 ppm and 2.5 ppm (as PAA) had a lower inactivation efficacy against Coxsackievirus B6 when compared to sodium hypochlorite of 1.6 ppm (as Cl_2).

However, when the confidence level is increased to 99% or 99.5%, VigorOx WWT II doses of 1.5 ppm and 2.5 ppm (as PAA) had similar inactivation efficacy against Coxsackievirus B6 when compared to sodium hypochlorite of 1.6 ppm (as Cl_2) at both 0.5 and 13 hours contact time.

Phase #2 Results

The hypothesis test results indicate that VigorOx WWT II doses of 3.5 ppm and 4.5 ppm (as PAA) exhibited similar inactivation efficacy against Coxsackievirus B6 when compared to sodium hypochlorite of 1.6 ppm (as Cl_2), at both contact times of 0.5 and 13 hours for the 95, 99 and 99.5% confidence levels.

VI. CONCLUSIONS

- The results confirmed that VigorOx WWT II can serve as an effective primary disinfectant for Valley East WWTP in Sudbury, ON.

- When considering *E. coli* as indicator organism, a dose of 1.5 ppm of VigorOx WWT II (as PAA) is equivalent to the current 1.6 ppm dose of hypochlorite (as Cl_2).

- When considering Coxsackievirus as indicator organism, the dose required for VigorOx WWT II to provide equivalent disinfection efficiency to the current 1.6 ppm dose of sodium hypochlorite (as Cl_2) depends on both the contact time and confidence level selected:

    - At a contact time of 0.5 hours (the average residence time of the disinfection contact tank at Valley East WWTP), a dose of 1.5 ppm of VigorOx WWT II (as PAA) is required.

    - At a contact time of 13 hours (the average residence time at the Plant's outfall pipe), a dose of 1.5 ppm of VigorOx WWT II (as PAA) is required for confidence levels of 99% or higher; but the required VigorOx WWT II dose increases to 3.5 ppm if a 95% confidence level is selected.

Carter Verplanck and PeroxyChem will provide a full-scale implementation of VigorOx PAA disinfection at the Tull C. Allen WWTP to replace the existing Chlorine Disinfection System. Implementation of a VigorOx disinfection regime will include Carter Verplanck installing a complete standard tote storage, chemical containment and chemical feed system. The equipment will be purchased by Oxford Water & Sewer Board and PAA will be provided by Carter Verplanck an approved distributor for PeroxyChem.

Supply and Delivery of VigorOx WWT II

Carter Verplanck/PeroxyChem will supply and deliver VigorOx WWT II Peracetic Acid, U.S. EPA Registration 65402-8, in 3,000lb One-way IBC totes.

Installation and Startup Equipment

The following equipment (the "Equipment") will be delivered, installed and started up by Carter Verplanck at the Site:

Quantity	**Description**
1	Two (2) 330 gal Tote Containment Units PAK735.
1	One (1) PAA Feed Pump Skid, with duty and redundant peristaltic pumps with capacity up to 31.7gph, and related piping, wiring, and containment.
1	One (1) Handheld PAA Residual Analyzer, with consumables.
1	Portable eye-wash station.
1	Lot of Teflon tubing for injection line.

Full Implementation & Training

The pump skid is connected to the WWTP effluent flow meter 4-20 mA signal and will dose PAA at two feed points at the front end of the existing disinfection contact chambers. The dosing rate for PAA will ramp up and down based upon the flow rate indicated at the effluent flow meter. The feed rate in ppm of PAA is based upon lab results and the previously performed trial using PAA at this facility. The initial startup setpoint for PAA will be 1.7 ppm which is much higher than the lab and pilot testing results of 1.3 ppm for full disinfection. The initial dosing is to shock the system and cleanse the sidewalls of the contact basing and effluent piping. After 24 hours, the dosing will ramp down slowly over the next few days to the anticipated operating ppm. E-coli testing at the WWTP will be the measurement we use to confirm PAA effectiveness and confirm dosing rate can be dropped to a lower level.

PAA as mentioned above is fed at the front end of the disinfection contact basins. Per EPA and the local regulatory body regulations, PAA residual testing will be performed with provided Analyzer at the cascading outfall just beyond the contact basin. The residual must be at or below 1 ppm. This facility typically has a long contact time which is over 25 minutes even during high flow periods. It is anticipated and was shown during the trial that the PAA residual will be 0.5 ppm or lower.

PAA does not require any special safety plans for handling or using the chemical. As with any chemical there exists precautions and safety protocols. Training will be provided to all staff dealing with this

system. Spill containment will be installed to collect the full volume of PAA at the facility in case of a tote rupture or tube failure. If a spill occurs, the PAA is diluted with potable water and left for 24 hours. Once the 24 hours has passed, the drain valve on the containment vessel can be opened and containment water shall be discharged back into the treatment system. At this point, the PAA is fully exhausted and you are left with only water.

PAA is a heavy oxidizer so it is imperative that face/eye protection and proper gloves are used when handling the PAA. If it does get on your skin or in your eyes, water is the solution. An eye wash is provided with our systems. If it gets on the skin, you need to wash that part of your body as quickly as possible.

Torbert, Shanda R

From: Meredith Holzer <mholzer@oxfordwater.com>
Sent: Tuesday, November 21, 2017 2:43 PM
To: Torbert, Shanda R; Anderson, Emily D; Lutz, Daphne Y
Cc: mgaskins@oxfordwater.com
Subject: FW: Pilot Test for PAA
Attachments: Aquatic Toxicity v4.pdf; August2015 - VigorOx WWT II and Viruses.pdf; Jacangelo - Hopkins, virus.pdf; Oxford PAA Trial Report.pdf; Sudbury Summary Report 20140424.pdf; Oxford AL PAA_revised.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Shanda,

Please find the items you requested concerning the use of PAA for disinfection at Tull C. Allen WWTP. Please let me know if you need additional information.

Thank you,

Meredith Holzer, P.E.
Oxford Water Works & Sewer Board
PO Box 3663
600 Barry Street
Oxford, AL 36203
(256) 831-5618 - phone
(256) 831-9063 - fax

PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals

DANGER – Corrosive, causes eye and skin damage. Harmful if swallowed. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Wash thoroughly with soap and water after handling. Do not breathe vapor or spray mist. Do not enter an enclosed area without proper respiratory protection.

Physical or Chemical Hazards – Strong oxidizing agent. Mix only with water. **VigorOx® WWT II** is not combustible; however, at temperatures exceeding 156°F, decomposition occurs releasing oxygen. The oxygen released could initiate or promote combustion of other materials.

Environmental Hazards – This pesticide is toxic to birds, mammals, fish and aquatic invertebrates, shrimp, clams and oysters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. In developing the NPDES permit, restrictions on the release of waters containing this product during low-flow periods should be considered.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR DISINFECTION OF SEWAGE AND WASTEWATER EFFLUENTS IN TREATMENT PLANTS

Use **VigorOx® WWT II** to treat sewage and wastewater effluent related to public and private wastewater treatment plants. **VigorOx® WWT II** may be applied directly to the effluent or may be used with an appropriate activator such as hydrogen peroxide or other technology. **VigorOx® WWT II** may be applied to effluent water discharged from primary, secondary, or tertiary treatments; and to effluent water discharged from trickle bed or percolating fluidized bed filters. The application rate for individual facilities will depend upon the degree of bioloading of the effluent stream to be discharged and the local microbial discharge limit and the Dilution Factor (DF) for the receiving stream. Adjust application rate to meet the need of the individual facility.

1. Add **VigorOx® WWT II** to effluent water at a concentration of 0.5 ppm to 15 ppm.
2. Use an appropriate peracetic acid test kit analyzer to ensure that the maximum amount of peracetic acid that can be discharged is not exceeded. Contact your PeroxyChem representative for assistance establishing treatment regimes.

SECTION 3 IS NOT APPLICABLE TO CALIFORNIA

3. The maximum amount of peracetic acid that can be discharged is:

   i. 0.09 * DF, where DF ≥ 12 and

   $$DF = \frac{\text{plant effluent discharge + receiving stream 7Q10}}{\text{plant effluent discharge}}$$

   where 7Q10 is the minimum average 7-day flow expected to occur once every 10 years for the receiving stream; or

   ii. 1 ppm if the 7Q10 is unknown or DF < 12.

NOTE: Before using **VigorOx® WWT II** to sanitize metal surfaces, it is recommended that the diluted solution be tested on a small area to determine compatibility.

In all applications always prepare a new solution daily to ensure effectiveness. Do not re-use solutions. Dispose of unused solution.

NOTE: May cause bleaching of treated surfaces

VigorOx® WWT II

FOR INDUSTRIAL USE ONLY

Active Ingredients:	Peroxyacetic acid	15%
	Hydrogen peroxide	23%
Inert Ingredients:		62%
Total		100%

KEEP OUT OF REACH OF CHILDREN

DANGER

VigorOx® WWT II is for use in wastewater and sewage effluent disinfection in public and private treatment facilities.

FIRST AID: Have the product container or label with you when calling a poison control center or doctor or going for treatment.

IF IN EYES:
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

IF INHALED:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

IF SWALLOWED:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

PeroxyChem

Manufactured by:
PeroxyChem
2005 Market Street, Suite 3200
Philadelphia, PA 19103

STORAGE AND DISPOSAL

STORAGE

NEVER RETURN VigorOx® WWT II TO THE ORIGINAL CONTAINER AFTER IT HAS BEEN REMOVED. Avoid all contaminants, especially dirt, caustic, reducing agents, and metals. Contamination and impurities will reduce shelf life and can induce decomposition. In case of decomposition, isolate container, douse container with cool water and dilute with large volumes of water.

Avoid damage to containers. Keep container closed at all times when not in use. Keep container out of direct sunlight. To maintain product quality, store at temperatures below 86°F. Do not store on wooden pallets.

PROCEDURE FOR LEAK OR SPILL: Stop leak if this can be done without risk. Shut off ignition sources; no flames, smoking, flares, or spark producing tools. Keep combustible and organic materials away. Flush spilled material with large quantities of water. Undiluted material should not enter confined spaces.

DISPOSAL

PESTICIDE DISPOSAL: If material has been spilled, an acceptable method of disposal is to dilute with at least 20 volumes of water followed by discharge into suitable treatment system in accordance with all local, state, and Federal environmental laws, rules, regulations, standards, and other requirements. Because acceptable methods of disposal may vary by location, regulatory agencies should be contacted prior to disposal. **VigorOx® WWT II** which is to be discarded should be disposed of as hazardous waste after contacting the appropriate local, state, or Federal agency to determine proper procedures.

CONTAINER DISPOSAL:

Nonrefillable containers greater than or equal to 5 gallons. Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Empty drums are not returnable to PeroxyChem, LLC unless special arrangements have been made. Dispose of drums in accordance with local, state, and Federal regulations.

All Refillable containers. Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Return to PeroxyChem, LLC for reuse.

EMERGENCY TELEPHONE NUMBERS (24 HOURS)
MEDICAL: Collect 303-389-1409
CHEMTREC: 800-424-9300
OTHER: Collect 716-879-0400

EPA Reg. No. 64502-8

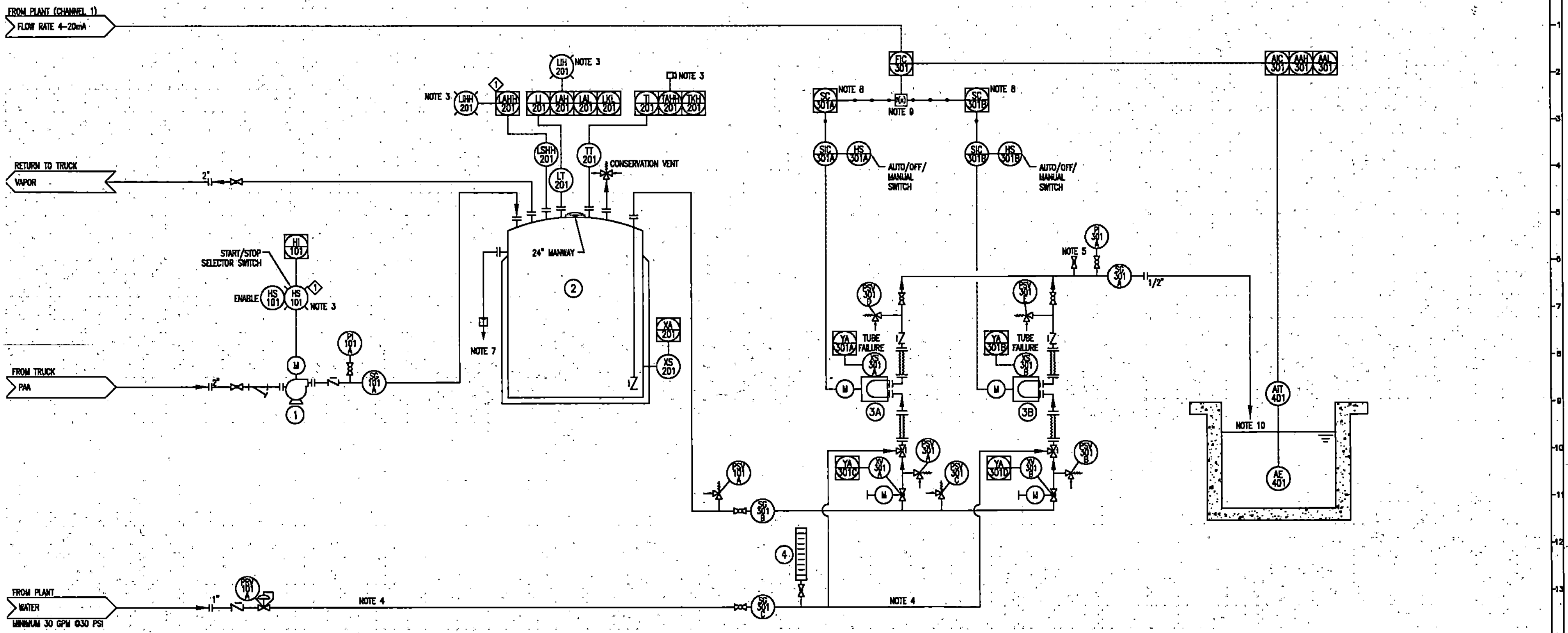
EPA Est. No. 65402-NY-001

Net Contents:

D.O.T. Description: UN 3109, Organic Peroxide Type F, Liquid (<= 17% Peracetic Acid with <= 26% Hydrogen Peroxide)

PC-1035

DO NOT STORE OR TRANSPORT ON WOODEN PALLETS



NOTES:

1. ALL PSV DISCHARGE LINES ROUTED TO SKID CONTAINMENT. CONTAINMENT NOT SHOWN FOR CLARITY.
2. ALL DRAIN VALVE DISCHARGE LINES ROUTED TO SKID CONTAINMENT. FLUSH AND DRAIN LINES NOT SHOWN FOR CLARITY.
3. LOCATED ON LOCAL CONTROL PANEL ON P-101 SKID.
4. OPTIONAL INSULATION AND HEAT TRACE TO BE DETERMINED BY SITE CONDITIONS.
5. OPTIONAL PULSATION DAMPER.
6. N/A
7. SANITARY DRAIN TIE IN MUST BE PROVIDED FOR SKID CONTAINMENT, LINE FLUSH, AND TANK FLUSH OVERFLOW.
8. PUMP WILL AUTOMATICALLY SHUT DOWN AND SWITCH TO BACKUP ON VFD FAULT OR TUBE RUPTURE.
9. VIGOROX FEED RATE CONTROLLED BY PLC BASED ON ONE OF THE FOLLOWING:
   9.1. PLANT FLOW
   9.2. PLANT FLOW + PAA RESIDUAL
   9.3. PLANT FLOW + PAA DEMAND
10. INJECTION METHOD TO BE DETERMINED BY SITE CONDITIONS.

EQUIPMENT	PUMP (1)	TANK (2)	PUMP (3A)(3B)	CALIBRATION COLUMN (4)
PLANT ID.	P-101	T-201	P-301A P-301B	CC-301
NAME	UNLOADING PUMP	PAA STORAGE TANK	PAA FEED PUMP	CALIBRATION COLUMN
PART NO.	[illegible]	[illegible]	4001V	[illegible]
SERIAL NO.	[illegible]	[illegible]		[illegible]
MATERIAL	[illegible] / TEFLON	[illegible]	[illegible]	PVC
SIZE	4.75 IMPELLER	[illegible]	1/2" TUBING ID	18"
CAPACITY	[illegible]	[illegible] GAL	[illegible]	[illegible]
TEMP/PRESS	[illegible]	[illegible]	[illegible]	
HP/V/RPM	[illegible]		[illegible]	
WEIGHT		[illegible] LB	75 LB	
VENDOR	[illegible] PUMP	[illegible] INDUSTRIES	[illegible] SYSTEMS	[illegible]

REFERENCE DRAWINGS	
	FUNCTIONAL SCHEMATIC
90160-01-001	VIGOROX WWTII WASTEWATER DISINFECTION
90160-01-002	1T65-1P400
90160-01-003	ONE TANK
XXXX	ONE INJECTION
XXXX	DATE: 8/24/2015
XXXX	SCALE: NTS

PeroxyChem
2005 Market Street, Suite 3200
Philadelphia, PA 19103

DRAWING NO. FS-90160-03
REV. A

Torbert, Shanda R

From: Meredith Holzer <mholzer@oxfordwater.com>
Sent: Thursday, September 21, 2017 9:56 AM
To: Torbert, Shanda R; Anderson, Emily D
Cc: mgaskins@oxfordwater.com; wlivingston@oxfordwater.com
Subject: FW: Oxford PAA Overview
Attachments: VigorOX WWT II - Label.pdf; Functional Schematic - Bulk Feed System - FS-90160-03-A.pdf; Oxford AL PAA.DOCX

Please see the attached proposed disinfection for the Tull C. Allen WWTP. We would like to implement as soon as possible in order to ensure meeting new E.coli limits. The bulk feed system drawing is what was installed in Madison Utilities and what would be used for Oxford as well. The document describes the system to be used at Oxford Tull C. Allen WWTP.

Oxford requests the approval of the change in disinfection system.

Thank you,

Meredith Holzer, P.E.
Oxford Water Works & Sewer Board
PO Box 3663
600 Barry Street
Oxford, AL 36203
(256) 831-5618 - phone
(256) 831-9063 - fax