Arkansas Department of Environmental Quality
Water Quality Management Plan Update Summary Sheet

Date: 2/15/2017

☐ New Permit ☒ Renewal Permit ☐ Amended Permit

Type of Discharge: Wet Deck (Industrial)

Facility Name: Anthony Forest Products – Urbana Mill

Permit No.: AR0047384

Design Flow Rate (MGD): 0.07

Receiving Stream: Unnamed tributary of North Lapile Creek

HUC + Reach Code: 08040202+005 **7Q10:** 0 cfs

Planning Segment: 2D **County:** Union

Proposed Effluent Limits in mg/L:

No changes from current effluent limits shown below.

Current Effluent Limits in mg/L:

Year-round: 30/35/2 (BOD5/TSS/DO)

TMDL Limits: None

Justification (Sag = Minimum Modeled Value ≠ Difference in Value):

Reach No.	Length (miles)	DO WQS_C (mg/L)	DO Sag_C (mg/L)	Distance to DO Sag_C (miles)	DO WQS_P (mg/L)	DO Sag_P (mg/L)	Distance to DO Sag_P (miles)
1_A	1.0	2.0	1.863[1]	0.05	5.0	4.871[1]	0.0
1_B	0.1	3.0	2.089	0.0	5.0	5.606	0.0

Values in above table are from a modeling analysis dated 2/15/2017

Outfall Location (Lat/Long): 33° 09' 46.0" N; 92° 26' 52.7" W

Remarks: This is for the reissuance of the discharge permit for this existing facility. No changes to the 208 Plan are being made with this permit renewal.

[1] Based on the MOA, a sag below the water quality standard of up to 0.2 mg/l is allowed to account for model uncertainty.

Model Input Data

Facility Name: Anthony Forest Products – Urbana Mill

Permit Number: AR0047384

W.S. Drainage Area (mi^2): 0.1 Ecoregion: Gulf Coastal Plains

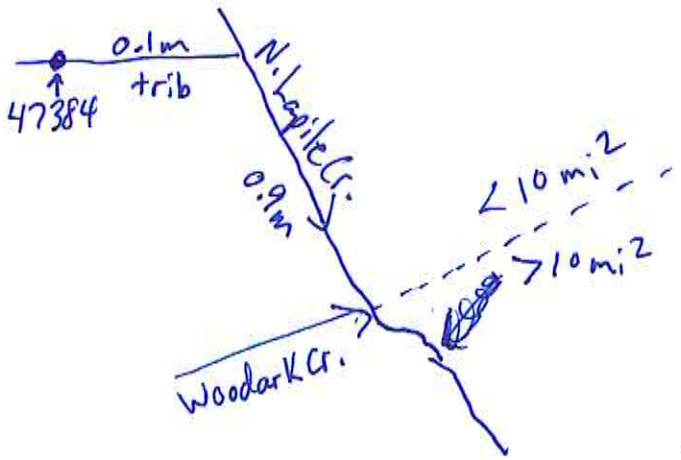
	Critical Season (May-Oct.)		Primary Season (Nov.-Apr.)	
	North Lapile Creek above Woodard Cr. (Reach 1a)	North Lapile Creek below Woodard Cr. (Reach 1b)	North Lapile Creek above Woodard Cr. (Reach 1a)	North Lapile Creek below Woodard Cr. (Reach 1b)
D.O. Standard (mg/L)	2.0	3.0	5.0	
Temp. Standard (°C)	30		22	
Q stream (cfs)	0.039		1.0	
Velocity stream (fps)	0.012		0.072	
Depth stream (ft)	0.283		0.567	

Q_{DESIGN} (MGD): 0.07

Receiving Stream: Unnamed tributary, thence to North Lapile Creek

Permit type: Industrial

Model Schematic (not to scale)



Engineer: SB

Date: 2-15-2017

Input Model Coefficients

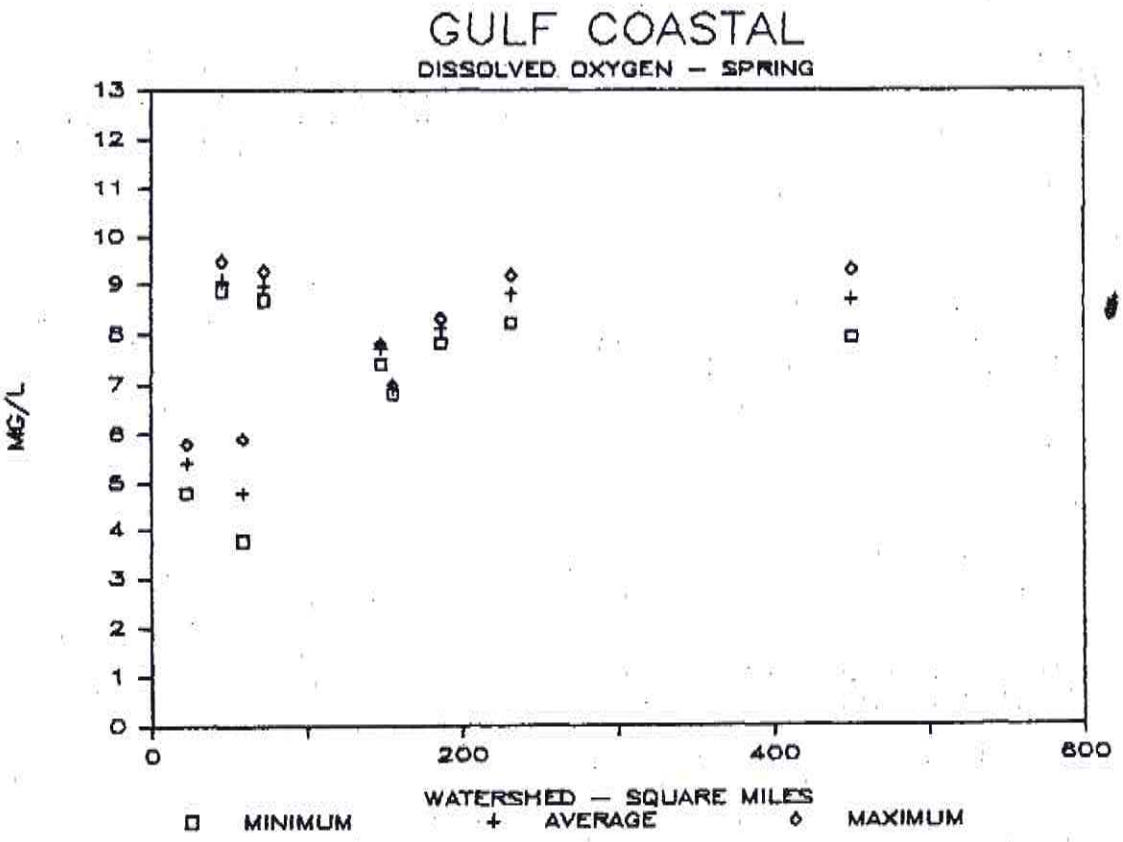
Reach 1

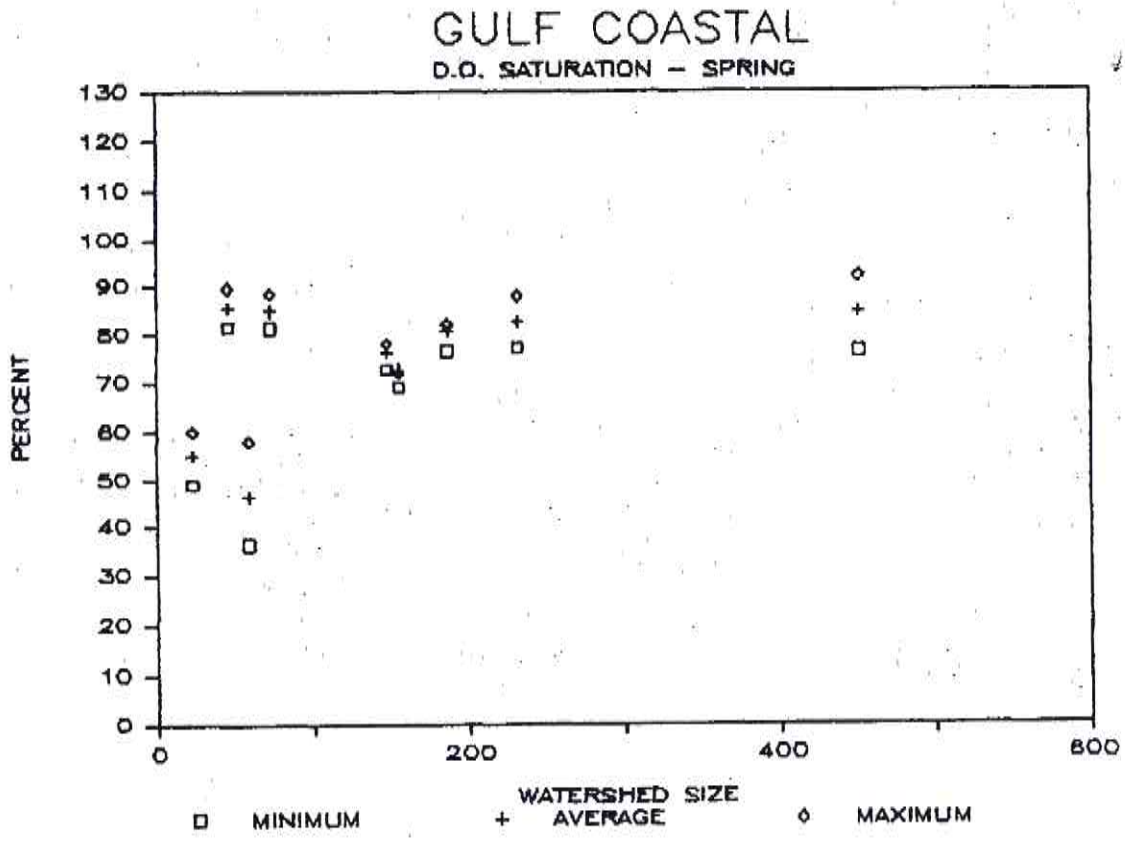
Coefficient – at 20° C	Input value	Justification
$BOD_{ult.}/BOD_5$	2.3	EPA Guidance
K_d (1/day)	0.4	MOA
K_n (1/day)	0.4	MOA
SOD (g/m^2/day)	1.0	MOA for TSS = 35 mg/l
K_a (1/day)	8.0 (critical season) 8.1 (primary season)	O'Conner-Dobbins formula

Engineer: SB

Date: 2-15-2017

Figure D-5. Dissolved Oxygen and Saturation Values for Gulf Coastal Ecoregion Reference Streams during Spring Period





Quick Calculator

0.89 Headwater in CFS

0.07 Discharger 1 in MGD

0 Discharger 2 in MGD

0 Discharger 3 in MGD

0 Discharger 4 in MGD

0 Discharger 5 in MGD

0 Discharger 6 in MGD

0 Discharger 7 in MGD

0 Discharger 8 in MGD

0 Discharger 9 in MGD

0 Discharger 10 in MGD

1 CFS is 0.64631674 MGD

1 MGD is 1.547229 CFS

Primary Season stream hydraulics

		0.072323	0.5	0.567722	0.4	24.35498	0.1	Accum
			FPS		Feet		Feet	MGD
	Reach 1 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 2 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 3 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 4 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 5 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 6 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 7 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 8 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 9 Velocity	0.072		Depth 0.567		Width 24.351		0.645
	Reach 10 Velocity	0.072		Depth 0.567		Width 24.351		0.645

BVC

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*                        SIMPLIFIED METHOD PROGRAM                      *
*                          COMPLETE INPUT LISTING                       *
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47384_C 2/15/2017

--*-*-*-* Run Information *-*-*-*-*-*

Name of receiving stream	trib/N. Lapile
Number of discharges	1
Number of reaches	1
Reaeration type	O'Connor-Dobbins
Run title	Anthony Forest -crit

--*-*-*-* Upstream Parameters *-*-*-*-*-*

Parameter		Value	Comment
Flow	(cfs)	0.000	
Temperature	(°C)	30.000	
Dissolved Oxygen	(mg/l)	0.000	
5-Day BOD	(mg/l)	0.000	
Ult. CBOD / 5-Day BOD		2.300	
pH	(su)	7.000	
Ammonia	(mg/l)	0.000	
Alkalinity	(mg/l)	-0.000	

--*-*-*-* Effluent Parameters *-*-*-*-*-*

Number of Discharges = 1

For Discharge Number 1 (Anthony)

Parameter		Value	Comment
Flow	(MGD)	0.070	
Temperature	(°C)	30.000	
Dissolved Oxygen	(mg/l)	2.000	
5-Day BOD	(mg/l)	30.000	
Ult. CBOD / 5-Day BOD		2.300	
pH	(su)	7.000	
Ammonia	(mg/l)	0.000	
Alkalinity	(mg/l)	-0.000	
Upstream river mile		1.000	

30/35/2

--*-*-*-* Reach Information *-*-*-*-*-*

Number of Reaches = 1
Reaeration Type is O'Connor-Dobbins

For Reach Number 1

Parameter		Value	Comment
Length	(mile)	1.100	
Velocity	(fps)	0.022	
Slope	(ft/mile)	-0.000	
Average Depth	(ft)	0.386	
Temperature	(°C)	30.000	Calculated

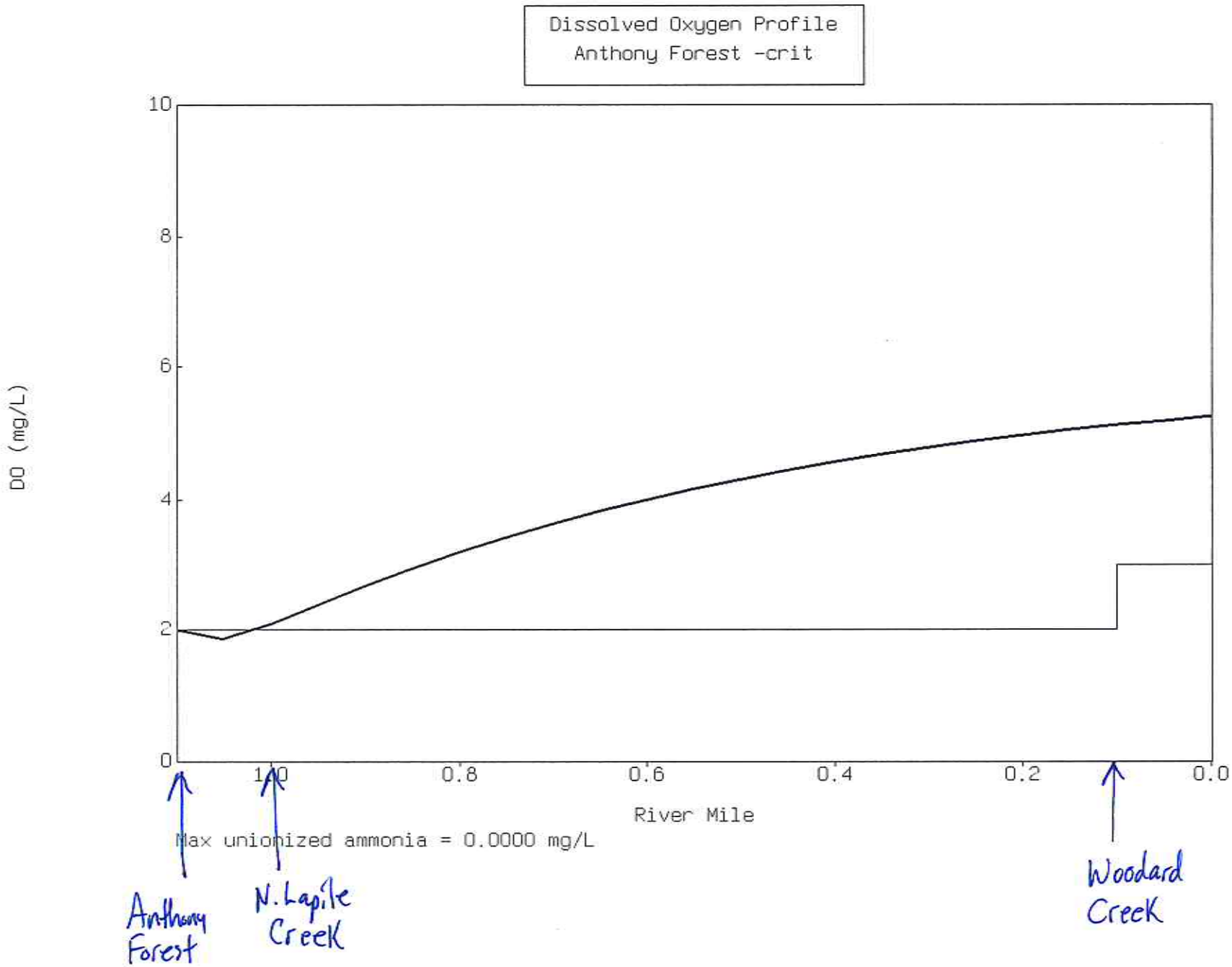
BOD Removal Rate	(1/day)	0.400	
NH3 Decay Rate	(1/day)	0.400	
Sediment Oxygen Demand	(g/m^2/day)	1.790	k20=1.0(tss=35)
Photosynthesis/respiration	(mg/L/day)	-0.000	

Temperature-corrected BOD removal rate	(1/day)	0.633
Temperature-corrected NH3 decay rate	(1/day)	0.864
Calculated reaeration rate at 20° C	(1/day)	7.978
Temperature-corrected reaeration rate	(1/day)	10.124
Calculated reach-averaged width	(ft)	12.744

--*-*-* Results for trib/N. Lapile *-*-*-*-*

Discharge is to -- trib/N. Lapile
Run Title is -- Anthony Forest -crit

River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
1.100	2.000		69.000		0.000	
1.050	1.863		63.191		0.000	
1.000	2.089		57.871		0.000	
0.950	2.383		52.999		0.000	
0.900	2.673		48.538		0.000	
0.850	2.944		44.452		0.000	
0.800	3.193		40.709		0.000	
0.750	3.421		37.282		0.000	
0.700	3.631		34.144		0.000	
0.650	3.822		31.269		0.000	
0.600	3.998		28.637		0.000	
0.550	4.159		26.226		0.000	
0.500	4.306		24.018		0.000	
0.450	4.441		21.996		0.000	
0.400	4.565		20.144		0.000	
0.350	4.678		18.449		0.000	
0.300	4.781		16.895		0.000	
0.250	4.876		15.473		0.000	
0.200	4.963		14.170		0.000	
0.150	5.043		12.978		0.000	
0.100	5.116		11.885		0.000	
0.050	5.182		10.884		0.000	
-0.000						
-0.000	5.244		9.968		0.000	


Dissolved Oxygen Profile
Anthony Forest -crit
DO (mg/L)
10
8
6
4
2
0
1.0
0.8
0.6
0.4
0.2
0.0
River Mile
Max unionized ammonia = 0.0000 mg/L
Anthony Forest
N. Lapile Creek
Woodard Creek

BVC

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**********************************************************************
*                      SIMPLIFIED METHOD PROGRAM                     *
*                        COMPLETE INPUT LISTING                      *
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47384_P 2/15/2017

--*-*-*-* Run Information *-*-*-*-*-*

Name of receiving stream	trib/N. Lapile
Number of discharges	1
Number of reaches	1
Reaeration type	O'Connor-Dobbins
Run title	AnthonyForest-prim

--*-*-*-* Upstream Parameters *-*-*-*-*-*

Parameter		Value	Comment
Flow	(cfs)	0.890	seasonalfishery
Temperature	(°C)	22.000	
Dissolved Oxygen	(mg/l)	5.220	60%sat erstudy
5-Day BOD	(mg/l)	1.000	
Ult. CBOD / 5-Day BOD		2.300	
pH	(su)	7.000	
Ammonia	(mg/l)	0.100	
Alkalinity	(mg/l)	-0.000	

--*-*-*-* Effluent Parameters *-*-*-*-*-*

Number of Discharges = 1

For Discharge Number 1 (Anthony)

Parameter		Value	Comment
Flow	(MGD)	0.070	
Temperature	(°C)	22.000	
Dissolved Oxygen	(mg/l)	2.000	
5-Day BOD	(mg/l)	30.000	
Ult. CBOD / 5-Day BOD		2.300	
pH	(su)	7.000	
Ammonia	(mg/l)	0.000	
Alkalinity	(mg/l)	-0.000	
Beginning of Reach Number		1.000	

--*-*-*-* Reach Information *-*-*-*-*-*

Number of Reaches = 1
Reaeration Type is O'Connor-Dobbins

For Reach Number 1

Parameter		Value	Comment
Length	(mile)	1.100	
Velocity	(fps)	0.072	
Slope	(ft/mile)	-0.000	
Average Depth	(ft)	0.567	
Temperature	(°C)	22.000	Calculated

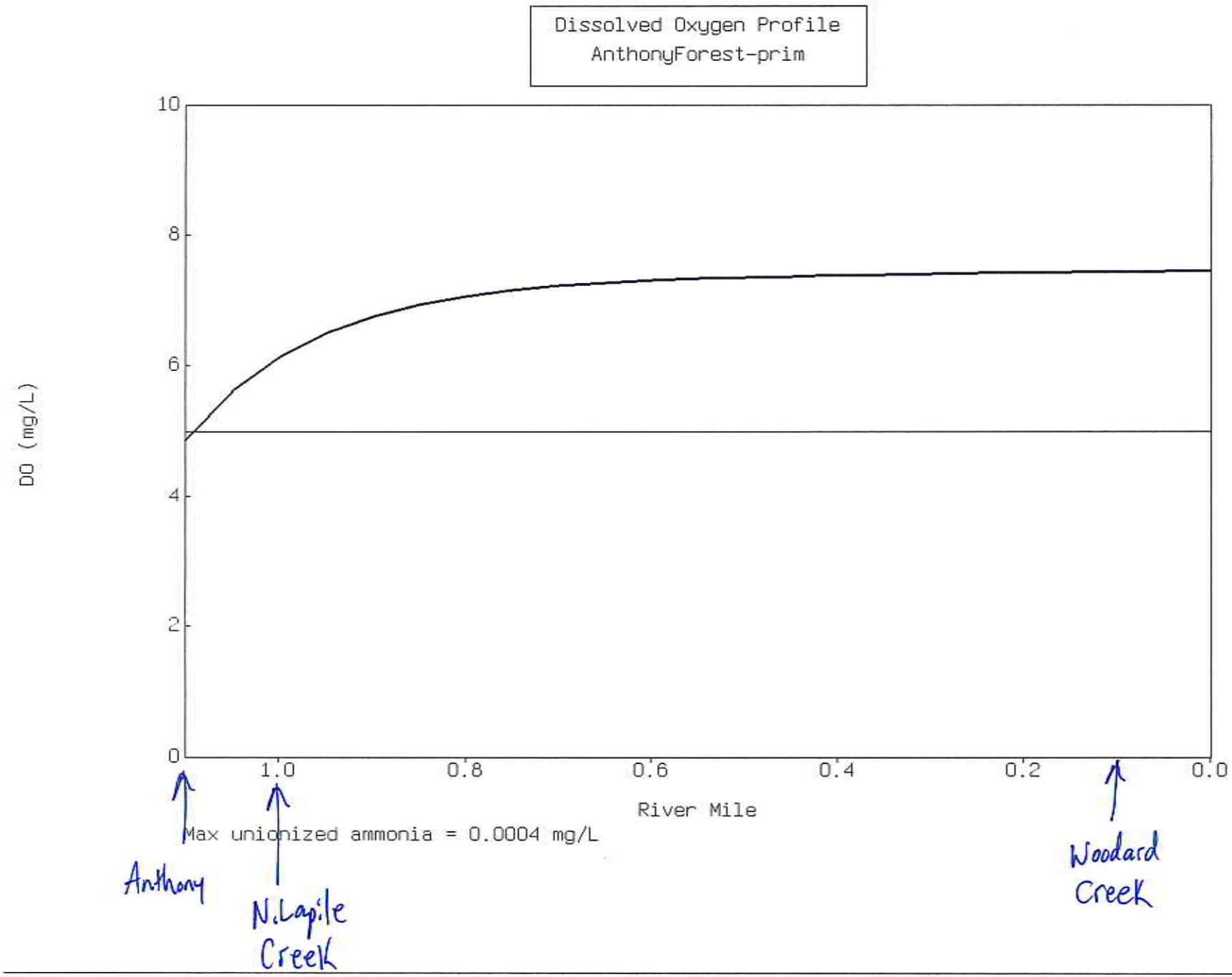
BOD Removal Rate	(1/day)	0.400	
NH3 Decay Rate	(1/day)	0.400	
Sediment Oxygen Demand	(g/m²/day)	1.130	k20=1.0(tss=35)
Photosynthesis/respiration	(mg/L/day)	-0.000	

Temperature-corrected BOD removal rate	(1/day)	0.438
Temperature-corrected NH3 decay rate	(1/day)	0.467
Calculated reaeration rate at 20° C	(1/day)	8.107
Temperature-corrected reaeration rate	(1/day)	8.503
Calculated reach-averaged width	(ft)	24.452

--*-*-*-* Results for trib/N. Lapile *-*-*-*-*-*

Discharge is to -- trib/N. Lapile
Run Title is -- AnthonyForest-prim

River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
1.100	4.871		9.531		0.089	
1.050	5.606		9.355		0.087	
1.000	6.121		9.183		0.086	
0.950	6.483		9.014		0.084	
0.900	6.739		8.847		0.082	
0.850	6.919		8.684		0.081	
0.800	7.048		8.524		0.079	
0.750	7.140		8.367		0.078	
0.700	7.206		8.213		0.076	
0.650	7.256		8.061		0.075	
0.600	7.292		7.913		0.073	
0.550	7.320		7.767		0.072	
0.500	7.342		7.624		0.070	
0.450	7.360		7.483		0.069	
0.400	7.374		7.345		0.068	
0.350	7.386		7.210		0.066	
0.300	7.397		7.077		0.065	
0.250	7.407		6.946		0.064	
0.200	7.416		6.818		0.062	
0.150	7.424		6.693		0.061	
0.100	7.432		6.569		0.060	
0.050	7.439		6.448		0.059	
-0.000						
-0.000	7.446		6.329		0.058	


Dissolved Oxygen Profile
AnthonyForest-prim
DO (mg/L)
10
8
6
4
2
0
1.0
0.8
0.6
0.4
0.2
0.0
River Mile
Max unionized ammonia = 0.0004 mg/L
Anthony
N. Lapile Creek
Woodard Creek