Jastrzebski, Marysia

To: Roberts, Christopher
Subject: City of Yellville - AR0034037 - request for limits

GoogleEarth_Image
.jpg (115 KB)...

Hello,

And another one. Just recently submitted(October 8, 2009), expiring in December.

One note: design flow in application and permit is 0.75 mgd; WQMP shows 1 mgd.

Remember - Crooked Creek is losing stream!

Thanks,

M

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Chris Roberts, P.E., Engineer

FROM: Marysia Jastrzebski, P.E., Engineer

DATE: November 3, 2009

SUBJECT: Update Effluent Limits

Name of facility: City of Yellville

NPDES Permit No. AR0034037

NPDES Permit Expiration Date: 12/31/2009

NPDES Permit Due Date: 12/31/2009

Are there any changes from previously permit? Yes _____ NO _____X_____

The following Effluent Limits and the receiving stream exist in WQMP, please confirm the accuracy:

Effluent Limits: (CBOD5/TSS/NH3-N/DO) (May-Oct.)=10/15/1/6 mg/l

(CBOD5/TSS/NH3-N) (Nov.-Apr.)= 10/15/5 mg/l

Q = 0.75 MGD

The receiving stream is: Crooked Creek, thence to the White River

Outfall Coordinates: Latitude: 36o 13' 15" Longitude: 92o 39'50"

County: Marion

Planning Segment: 4I

Previous permit 7Q10: _____

From: Chris Roberts, PE
TO: Marysia Jastrzebski, P.E.

7Q10 = _____ cfs
less than 10 square miles _____
more than 10 square miles _____
May affect water of another State _____ Yes _____ No

Justification

Arkansas Department of Environmental Quality
Permit Number: AR0034037

AFIN: 45-00023 **Facility County:** Marion
Name: YELLVILLE, CITY OF **City:** YELLVILLE
Fac Site Location: 1385 MCCOOL (E./HWY. 412 & 41)

YELLVILLE AR 72687-

Basic Permit Information

Issued: 11/01/1999 **Modified:**
Expiration: 12/31/2014 **Void:**
Permit County: 45 Marion
Media: W Water-NPDES
Status: A Active **Status changed on:**
Type: M Municipal
Staff: MJ MARYSIA JASTRZEBSKI
Stream Segment: 4I
Nearest Stream: CROOKED CREEK
Comment: YELLVILLE, CITY OF

Permit Invoicing Information

Fee Code: B Minor Without Toxic
Fee Volume: 0.750000 MGD (million gallons per day)
Init Pmt Inv #:
Billing Month: 06 JUNE
Inv Comment:

Special Invoice Print Flags

Print Comment? N *(If Yes, the comment above will be printed on any invoices generated for this permit.)*
Single Pmt Inv? N *(If Yes, this permit will appear on a separate invoice.)*
Sgl Inv Mail Lbl? N *(If both this and "Single Permit Invoice" are Yes, this permit's address will be used on the invoice.)*

Permit Mailing/Contact

Contact: Gayle Stude **Phone:** (870) 449-6581
Address: Mr. Gayle Stude **Fax:**
City of Yellville
P.O. Box 647
YELLVILLE AR 72687- US

E-Mail:

Permit GIS/Location

	Deg/Min/Sec	Decimal		UTM		
Latitude:	36 13 13.50	36.220416	**Northing:**	4,008,449.34	**Current Datum:**	NAD83
Longitude:	-92 39 41.08	-92.661412	**Easting:**	530,431.06	**Original Datum:**	NAD83
			Zone:	15	**Original Coord Sys:**	Lat/Long

Sec/Twnshp/Rge:


Outfall 001(permit)
36 13 15, -92 39 50
Facility (PDS)
sampling
36 13 13.2, -92 39 38.4
Facility (permit/appl.)
© 2009 Google
© 2009 Europa Technologies
Image State of Arkansas
Google
36°13'13.99" N 92°39'43.53" W
Jan 11, 2006
Eye alt 1604 ft

Jastrzebski, Marysia

From: Roberts, Christopher
Sent: Tuesday, November 10, 2009 3:20 PM
To: Jastrzebski, Marysia
Subject: Modeling Reports

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

Date: 11/05/2009

☐ New Permit ☒ Renewal Permit ☐ Amended Permit

Type of Discharge: Municipal Wastewater

Facility Name: City of Yellville

Permit No.: AR0034037

Design Flow Rate (MGD): 0.75

Receiving Stream: Crooked Creek, & thence to the White River

HUC + Reach Code: 11010003+048 **7Q10:**[1] 0 cfs

Planning Segment: 4I **County:** Marion

Proposed Effluent Limits in mg/L (CBOD5/TSS/NH3-N/DO):

May – October:[2] 10/15/1.0/6.0
November – March: 10/15/5.0/6.0
April: 10/15/3.9/6.0

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

Reach No.	Length (miles)	DO_C (mg/L)	Sag_C (mg/L)	Distance to Sag_C (miles)	DO_P (mg/l)	Sag_P (mg/L)	Distance to Sag_P (miles)
1	2	6.0	5.9	0.2	6.0	6.0	0.0

Current Effluent Limits in mg/L (CBOD5/TSS/NH3-N/DO):

May – October: 10/15/1/6.0
November – April: 10/15/5/None

Outfall Location (Lat/Long): 36° 13' 15" N; 92° 39' 50" W

Remarks: This is for the reissuance of the discharge permit for this existing facility.

[1] Also note that Crooked Creek near Yellville has been identified as a losing stream pursuant to Reg. 6.301(B).
[2] Per Reg. 2.106, the Critical Season is temperature dependent and tends to be from mid-May to mid-September.

Model Input Data

Facility Name: City of Yellville

Permit Number: AR0034037

Outfall Lat./Long.: 36° 13' 15" N; 92° 39' 50" W

W.S. Drainage Area (mi^2):[1] 400 Ecoregion: Ozark Highlands

	Critical Season (May-Oct.)	Primary Season (Nov.-Apr.)
D.O. Standard (mg/L)	6.0	6.0
Temp. Standard (°C)	29	22
Q stream (cfs)	1.16	1.16
Velocity stream (fps)	0.1	0.1
Depth stream (ft)	0.6	0.6

Q_{DESIGN} (MGD): 0.75 Planning Seg.: 4I

Receiving Stream: Crooked Creek, & thence to the White River

HUC + Reach Code: 11010003+048 Permit Type: Municipal

Other Facilities: 7Q10: 0 cfs

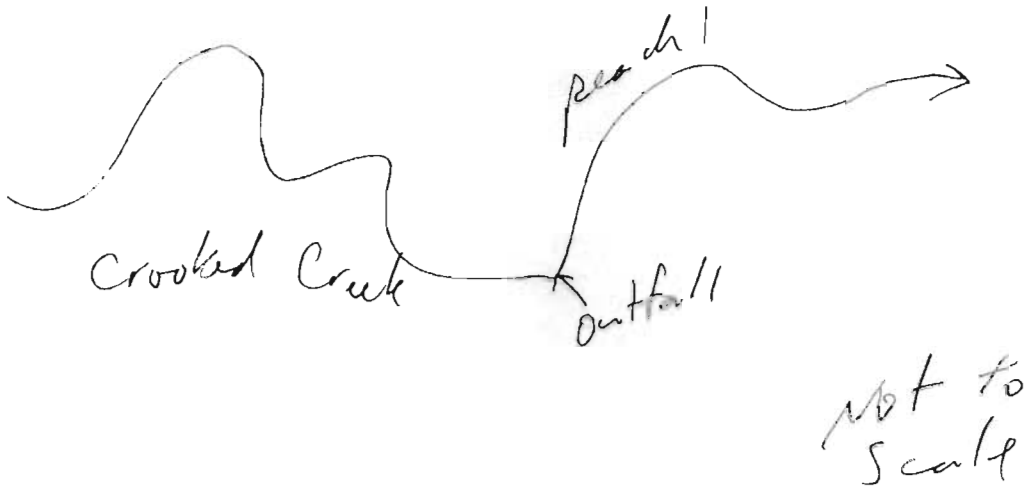
Name	Permit#	Outfall Coordinates	Q (MGD)	Limits (CBOD5/TSS/NH3-N/DO)
None				

[1] From the modeling analysis report dated February 9, 1989.

Engineer: CWK

Date: 11/5/09

Flow Diagram:



Input Model Coefficients

Reach 1

Coefficient – at 20° C	Input Value	Justification
BOD_{ult}/BOD_5	2.3	EPA Guidance
K_d (1/day)	0.3	Draft EPA MOA
K_n (1/day)	0.4	Draft EPA MOA
SOD (g/m^2/day)	0.5	Draft EPA MOA
K_a (1/day)	from Model	O'Connor-Dobbins

Recommendations:

Based on Reg. 6.301(C)(2), the previous permit, the attached models, and the attached toxicity spreadsheet, the following are the proposed monthly average treated effluent limits in mg/L (CBOD5/NH3-N/DO):

May – October:[2]	10/15/1.0/6.0
November – March:	10/15/5.0/6.0
April:	10/15/3.9/6.0

[2] Per Reg. 2.106, the Critical Season is temperature dependent and tends to be from mid-May to mid-September.

Engineer: _____

Date: 11/5/09

Ammonia Calculations

Facility Name	City of Yellville				
Major or Minor	Minor				
Permit Number	AR0034037				
Receiving Stream	Crooked Creek		Ecoregion or River name	Ozark Highlands	
7Q10, cfs		0	Watershed area (mi^2)	400	
0.25/0.67 multiplier		0.67	Regulation No. 2 Chronic Toxicity Criteria (Instream Concentration)		
Qb, cfs		0.00		AML, mg/l	DML, mg/l
Qe, MGD		0.75	April	3.9	3.9
Qe, cfs		1.16	May - October	3.9	3.9
Cb, mg/l		0	November - March	10.3	10.3

Allowable Effluent Conc., mg/l

(Qe * Ce) + (Qb* Cb) = (Qe + Qb) * IWC

Qe	Effluent Flow
Ce	Allowable Effluent Concentration
Qb	% of Low Flow of Receiving Stream
Cb	Background Concentration
IWC	Instream Waste Concentration Chronic Toxicity Criteria

Allowable Effluent Conc. (Ce), mg/l

Ce = (IWC (Qe + Qb) - Cb X Qb) / Qe

	Monthly Avg., mg/l	Daily Max., mg/l
April	3.90	3.90
May - October	3.90	3.90
November - March	10.30	10.30

Chronic Toxicity Criteria vs. D.O. Model Limits

	Monthly Average, mg/l		**Permit Limits**	Daily Maximum, mg/l		**Permit Limits**
Month	Toxicity limit	D.O. limit		Toxicity limit	D.O. limit	
April	3.90	5	3.90	3.90	7.5	3.90
May - October	3.90	1	1.00	3.90	1.5	1.50
November - March	10.30	5	5.00	10.30	7.5	7.50

BVC

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*                        SIMPLIFIED METHOD PROGRAM                       *
*                          COMPLETE INPUT LISTING                        *
**************************************************************************
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34037_C.SMP

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

Name of receiving stream	Crooked Creek
Number of discharges	1
Number of reaches	1
Reaeration type	O'Connor-Dobbins
Run title	Yellville_Critical

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

Parameter		Value	Comment
Flow	(cfs)	0.000	7Q10
Temperature	(°C)	29.000	Reg. 2 Critical
Dissolved Oxygen	(mg/l)	-0.000	
5-Day BOD	(mg/l)	-0.000	
Ult. CBOD / 5-Day BOD		2.300	EPA Guidance
pH	(su)	-0.000	
Ammonia	(mg/l)	-0.000	
Alkalinity	(mg/l)	-0.000	

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

Number of Discharges = 1

For Discharge Number 1 (CityofYellville)

Parameter		Value	Comment
Flow	(MGD)	0.750	Permit
Temperature	(°C)	29.000	Reg. 2 Critical
Dissolved Oxygen	(mg/l)	6.000	Permit
5-Day BOD	(mg/l)	10.000	Reg. 6.301(C)
Ult. CBOD / 5-Day BOD		2.300	EPA Guidance
pH	(su)	-0.000	
Ammonia	(mg/l)	1.000	Permit
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)	2.000	
Velocity	(fps)	0.100	EPA Spreadsheet
Slope	(ft/mile)	-0.000	
Average Depth	(ft)	0.600	EPA Spreadsheet
Temperature	(°C)	29.000	Calculated

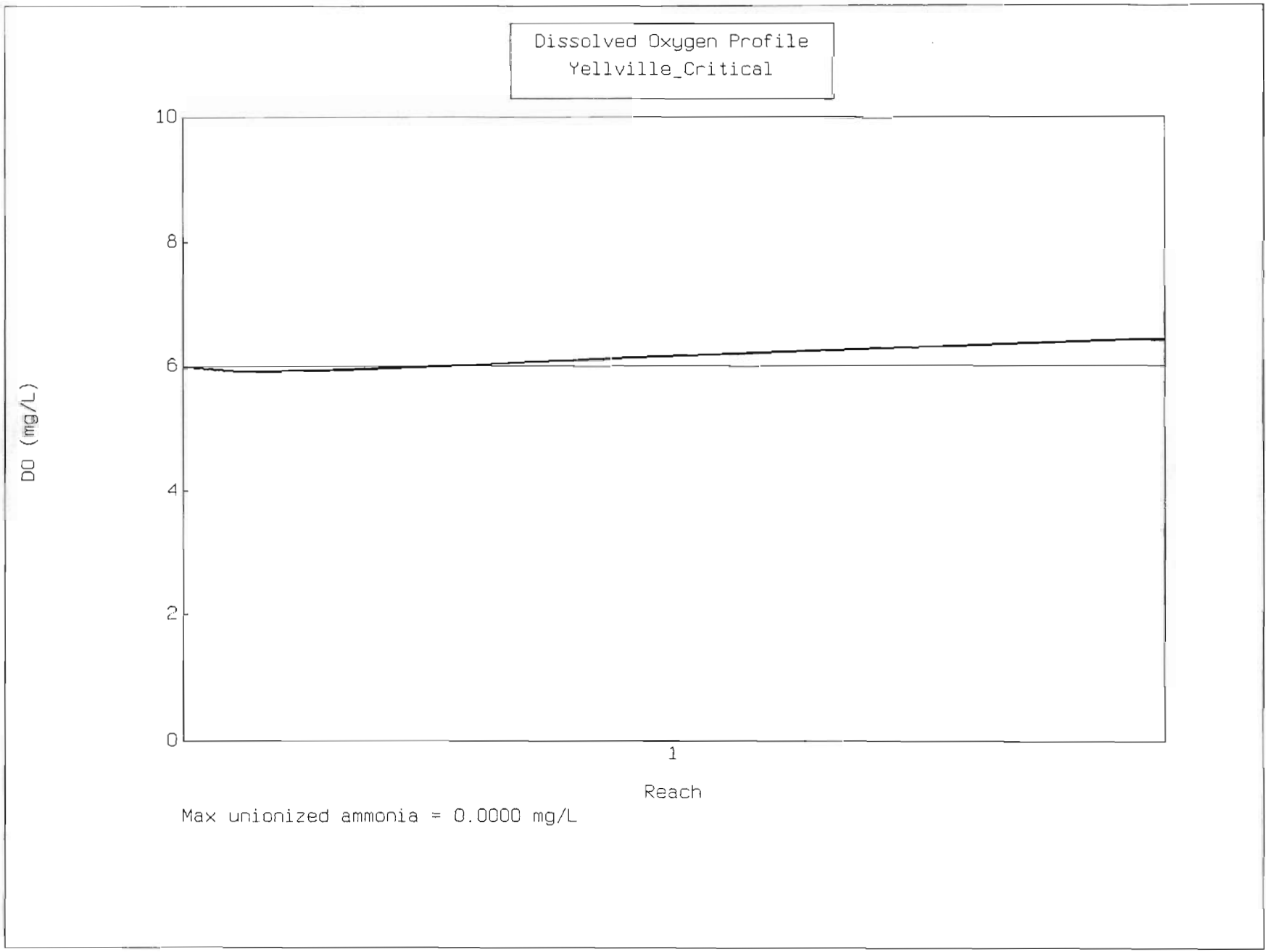
BOD Removal Rate	(1/day)	0.300	Draft EPA MOA
NH3 Decay Rate	(1/day)	0.400	Draft EPA MOA
Sediment Oxygen Demand	(g/m²/day)	0.800	k20 = 0.5
Photosynthesis/respiration	(mg/L/day)	-0.000	

Temperature-corrected BOD removal rate	(1/day)	0.454
Temperature-corrected NH3 decay rate	(1/day)	0.800
Calculated reaeration rate at 20° C	(1/day)	8.777
Temperature-corrected reaeration rate	(1/day)	10.875
Calculated reach-averaged width	(ft)	19.325

--*-*-*-* Results for Crooked Creek *-*-*-*-*-*

Discharge is to -- Crooked Creek
Run Title is -- Yellville_Critical

River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
2.000	6.000		23.000		1.000	
1.900	5.936		22.371		0.952	
1.800	5.923		21.760		0.907	
1.700	5.935		21.165		0.864	
1.600	5.961		20.586		0.822	
1.500	5.992		20.023		0.783	
1.400	6.025		19.476		0.746	
1.300	6.059		18.944		0.710	
1.200	6.093		18.426		0.676	
1.100	6.126		17.922		0.644	
1.000	6.158		17.432		0.613	
0.900	6.189		16.956		0.584	
0.800	6.220		16.492		0.556	
0.700	6.249		16.041		0.530	
0.600	6.277		15.603		0.505	
0.500	6.304		15.176		0.480	
0.400	6.331		14.761		0.458	
0.300	6.356		14.358		0.436	
0.200	6.381		13.965		0.415	
0.100	6.405		13.583		0.395	
-0.000						
-0.000	6.428		13.212		0.376	


Dissolved Oxygen Profile
Yellville_Critical
10
8
6
4
2
0
DO (mg/L)
1
Reach
Max unionized ammonia = 0.0000 mg/L

BVC

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**************************************************************************
*                        SIMPLIFIED METHOD PROGRAM                       *
*                          COMPLETE INPUT LISTING                        *
**************************************************************************
```

34037_P.SMP

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

Name of receiving stream	Crooked Creek
Number of discharges	1
Number of reaches	1
Reaeration type	O'Connor-Dobbins
Run title	Yellville_Primary

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

Parameter		Value	Comment
Flow	(cfs)	0.000	7Q10
Temperature	(°C)	22.000	Reg. 2 Primary
Dissolved Oxygen	(mg/l)	-0.000	
5-Day BOD	(mg/l)	-0.000	
Ult. CBOD / 5-Day BOD		2.300	EPA Guidance
pH	(su)	-0.000	
Ammonia	(mg/l)	-0.000	
Alkalinity	(mg/l)	-0.000	

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

Number of Discharges = 1

For Discharge Number 1 (CityofYellville)

Parameter		Value	Comment
Flow	(MGD)	0.750	Permit
Temperature	(°C)	22.000	Reg. 2 Primary
Dissolved Oxygen	(mg/l)	6.000	Proposed
5-Day BOD	(mg/l)	10.000	Reg. 6.301(C)
Ult. CBOD / 5-Day BOD		2.300	EPA Guidance
pH	(su)	-0.000	
Ammonia	(mg/l)	5.000	Permit
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)	2.000	
Velocity	(fps)	0.100	EPA Spreadsheet
Slope	(ft/mile)	-0.000	
Average Depth	(ft)	0.600	EPA Spreadsheet
Temperature	(°C)	22.000	Calculated

BOD Removal Rate	(1/day)	0.300	Draft EPA MOA
NH3 Decay Rate	(1/day)	0.400	Draft EPA MOA
Sediment Oxygen Demand	(g/m²/day)	0.600	k20 = 0.5
Photosynthesis/respiration	(mg/L/day)	-0.000	

Temperature-corrected BOD removal rate	(1/day)	0.329
Temperature-corrected NH3 decay rate	(1/day)	0.467
Calculated reaeration rate at 20° C	(1/day)	8.777
Temperature-corrected reaeration rate	(1/day)	9.206
Calculated reach-averaged width	(ft)	19.325

--*-*-*-* Results for Crooked Creek *-*-*-*-*-*

Discharge is to -- Crooked Creek
Run Title is -- Yellville_Primary

River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
2.000	6.000		23.000		5.000	
1.900	6.115		22.542		4.859	
1.800	6.201		22.094		4.723	
1.700	6.270		21.654		4.590	
1.600	6.329		21.223		4.461	
1.500	6.382		20.801		4.336	
1.400	6.431		20.387		4.214	
1.300	6.477		19.982		4.095	
1.200	6.521		19.584		3.980	
1.100	6.563		19.194		3.868	
1.000	6.604		18.813		3.760	
0.900	6.644		18.438		3.654	
0.800	6.683		18.071		3.551	
0.700	6.721		17.712		3.451	
0.600	6.758		17.359		3.354	
0.500	6.793		17.014		3.260	
0.400	6.828		16.675		3.168	
0.300	6.862		16.344		3.079	
0.200	6.895		16.019		2.993	
0.100	6.928		15.700		2.909	
-0.000						
-0.000	6.959		15.387		2.827	

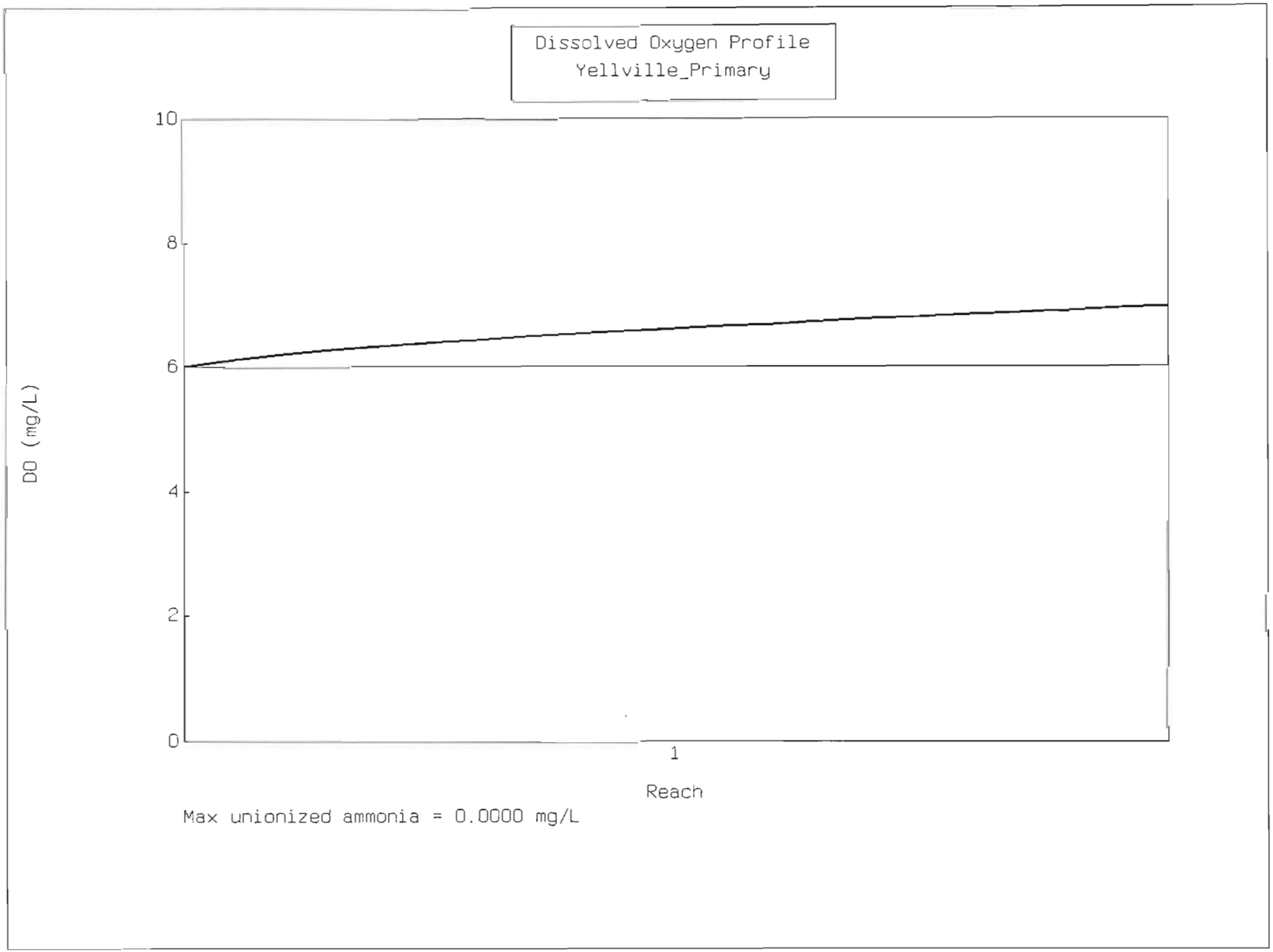
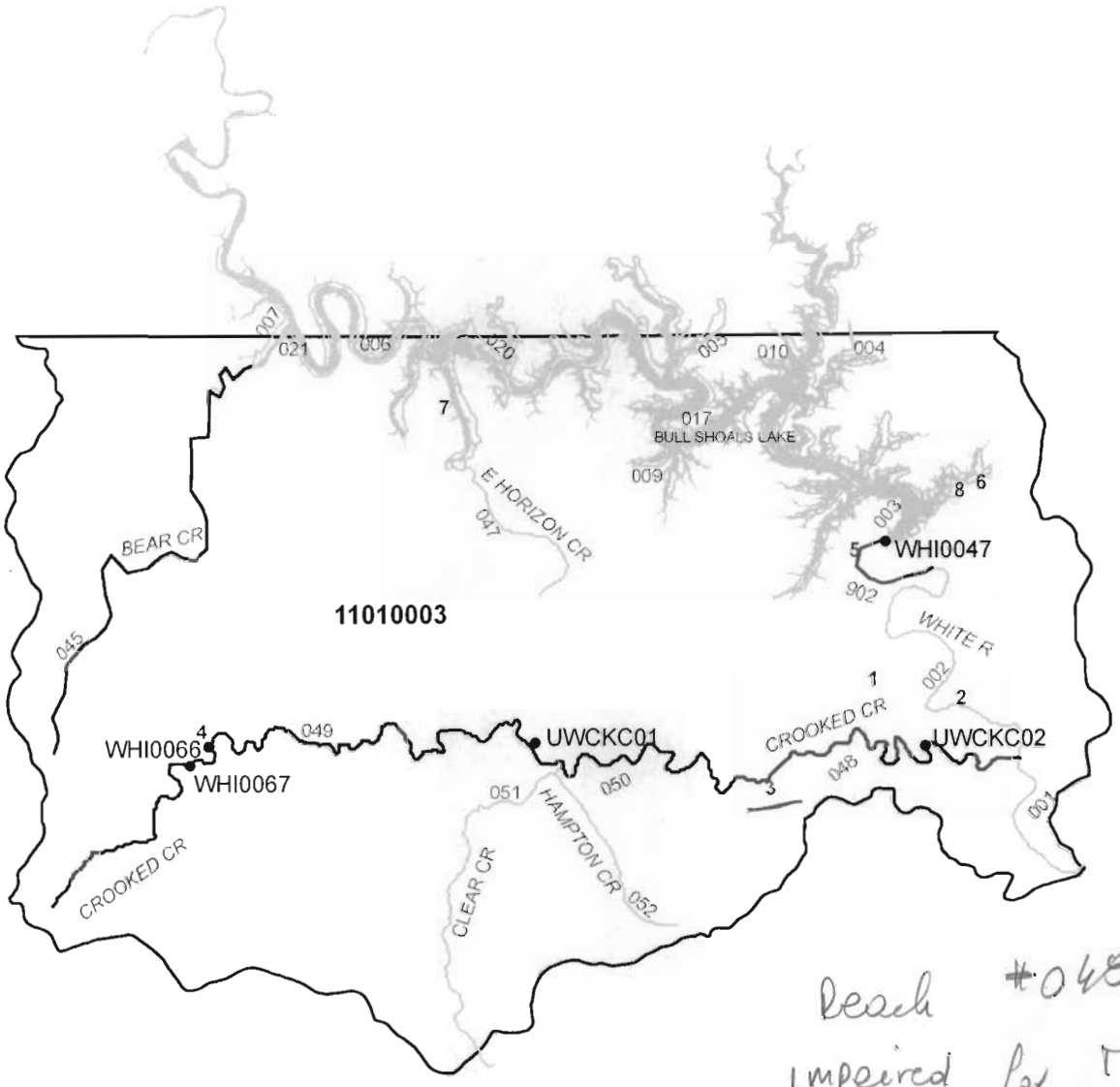

Dissolved Oxygen Profile
Yellville_Primary
10
8
6
4
2
0
DO (mg/L)
1
Reach
Max unionized ammonia = 0.0000 mg/L

Figure A-40: Planning Segment 4I



Permitted Facilities
• Monitoring Stations
Category 5 Waters
EPA Added Category 5g

(Segment 4I)

Table A-60: Segment 4I Active NPDES Permits

Permit Number	Facility Name	Receiving Waters	USGS H.U.C	Reach	Map Number
AR0021717	FLIPPIN, CITY OF	FALLEN ASH CK,WHITE RV	11010003	002L	1
AR0033545	COTTER-GASSVILLE WASTEWATER	WHITE RV	11010003	002L	2
AR0034037	YELLVILLE, CITY OF	CROOKED CK,WHITE RV	11010003	048	3
AR0034321	HARRISON, CITY OF	CROOKED CK,WHITE RV	11010003	049	4
AR0037028	BULL SHOALS, CITY OF	WHITE RV	11010003	002U	5
AR0037435	HOLIDAY SHORES RESORT	BULL SHOALS LK	11010003	003	6
AR0043753	SUGARLOAF WASTEWATER TREATMENT	E SUGARLOAF CK,BULL SHOALS LK	11010003	020	7
AR0048518	LAURENCE'S CEDAR OAKS RESORT	BULL SHOALS LK	11010003	003	8