

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

Date: 5/12/2016

New Permit Renewal Permit Amended Permit

Type of Discharge: Industrial Wastewater (Outfall 001); Domestic Wastewater (Outfall 003)
Contaminated Stormwater (Outfalls 002, 006, 007)

Facility Name: El Dorado Chemical Company

Permit No.: AR0000752

Design Flow Rate (MGD): 2.8 (Outfall 001); 0.017 (Outfall 003); Variable (002, 006, 007)

Receiving Stream: unnamed tributary of Flat Creek

HUC + Reach Code: 08040201+606 **7Q10:** 0 cfs

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

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

Outfall 001: May – October: */30/2.43/4.0 *No CBOD5 limit included based on conservative assumed value in model
November – March: */30/5.50/5.0 *No CBOD5 limit included based on conservative assumed value in model
April: */30/2.43/5.0 *No CBOD5 limit included based on conservative assumed value in model

Outfall 003: May – October: 10/15/2.43/4.0
November – March: 10/15/5.50/2.0
April: 10/15/2.43/2.0

TMDL Limits (if any): The following monthly average limits are based on *TMDLs for Chloride, Sulfate, TDS, and Ammonia in the ELCC Tributary, Arkansas, dated 10/3/2002:*

Outfall	Parameter	Concentration mg/L	Mass lb/day
001/003 (April-October)	NH3-N	2.43	Report
001/003 (November-March)	NH3-N	5.50	Report
Sum of 001/003 (April-October)	NH3-N	N/A	37.90
Sum of 001/003 (November-March)	NH3-N	N/A	85.78
002/006/007 (April-October)	NH3-N	0.00	Report
002/006/007 (November-March)	NH3-N	0.32	Report
Sum of 002/006/007 (April-October)	NH3-N	N/A	0.00
Sum of 002/006/007 (November-March)	NH3-N	N/A	5.16
001/003/002/006/007	Chlorides	19	Report
Sum of 001/003	Chlorides	N/A	265
Sum of 002/006/007	Chlorides	N/A	73
001/003/002/006/007	Sulfates	41	Report
Sum of 002/006/007	Sulfates	N/A	33
Sum of 001/003	Sulfates	N/A	503
001/003/002/006/007	TDS	138	Report
Sum of 001/003	TDS	N/A	1338
Sum of 002/006/007	TDS	N/A	635

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

Outfall 003: May – October: 10/15/5
 November – March: 10/15/10
 April: 10/15/10

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	0.1	2.0	4.0	0.0	5.0	6.406	0.0
2a	1.7	2.0	1.981	0.55	5.0	5.247	0.7
2b	0.2	3.0	2.966	0.0	5.0	5.449	0.0

Values in above table are from a modeling analysis dated 12/9/2015. Reach 2a is portion of reach where DO WQS is 2.0 mg/L during critical season. Reach 2b is portion of reach where DO WQS changes to 3.0 mg/L during critical season.

Outfall Location (Lat/Long):
 Outfall 001: 33° 15' 33.8" N; 92° 41' 14.2" W
 Outfall 002: 33° 15' 45.3" N; 92° 41' 20.3" W
 Outfall 003: 33° 15' 38" N; 92° 41' 07" W
 Outfall 006: 33° 16' 03" N; 92° 41' 02" W
 Outfall 007: 33° 16' 6.3" N; 92° 41' 16" W

Remarks: This is for the reissuance of the discharge permit for this existing facility. The 208 Plan is being updated to include the following changes. These 208 Plan updates will be public noticed with the draft permit:

- DO instantaneous minimum limits of 5.0 mg/L during November – April and 4.0 mg/L during May – October were added at Outfall 001 based on the 5/12/2016 modeling analysis.
- DO instantaneous minimum limits of 2.0 mg/L during November – April and 4.0 mg/L during May – October were added at Outfall 003 based on the 5/12/2016 modeling analysis.
- NH3-N monthly average concentration limits of 2.43 mg/L during April-October and 5.5 mg/L during November-March were added at Outfalls 001 and 003, based on TMDL dated October 3, 2002.
- NH3-N monthly average mass limits of 37.9 lb/day during April-October and 85.78 lb/day during November-March for the sum of Outfalls 001 and 003 were added based on TMDL dated October 3, 2002.
- NH3-N monthly average concentration limits of 0.0 mg/L during April-October and 0.32 mg/L during November-March were added at Outfalls 002, 006, 007, based on TMDL dated October 3, 2002.
- NH3-N monthly average mass limits of 0.0 lb/day during April-October and 5.16 lb/day during November-March for the sum of Outfalls 002, 006, 007 were added based on TMDL dated October 3, 2002.
- Chlorides monthly average concentration limit of 19 mg/L, Sulfates monthly average concentration limit of 41 mg/L, and TDS monthly average concentration limit of 138 mg/L at Outfalls 001, 003, 002, 006, and 007 were added based on TMDL dated October 3, 2002.
- Chlorides monthly average mass limit of 265 lb/day, Sulfates monthly average mass limit of 503 lb/day, and TDS monthly average mass limit of 1338 lb/day, for the sum of Outfalls 001 and 003, were added based on TMDL dated October 3, 2002.

9. Chlorides monthly average mass limit of 73 lb/day, Sulfates monthly average mass limit of 33 lb/day, and TDS monthly average mass limit of 635 lb/day, for the sum of Outfalls 002, 006, 007, were added based on TMDL dated October 3, 2002.

ADEQ

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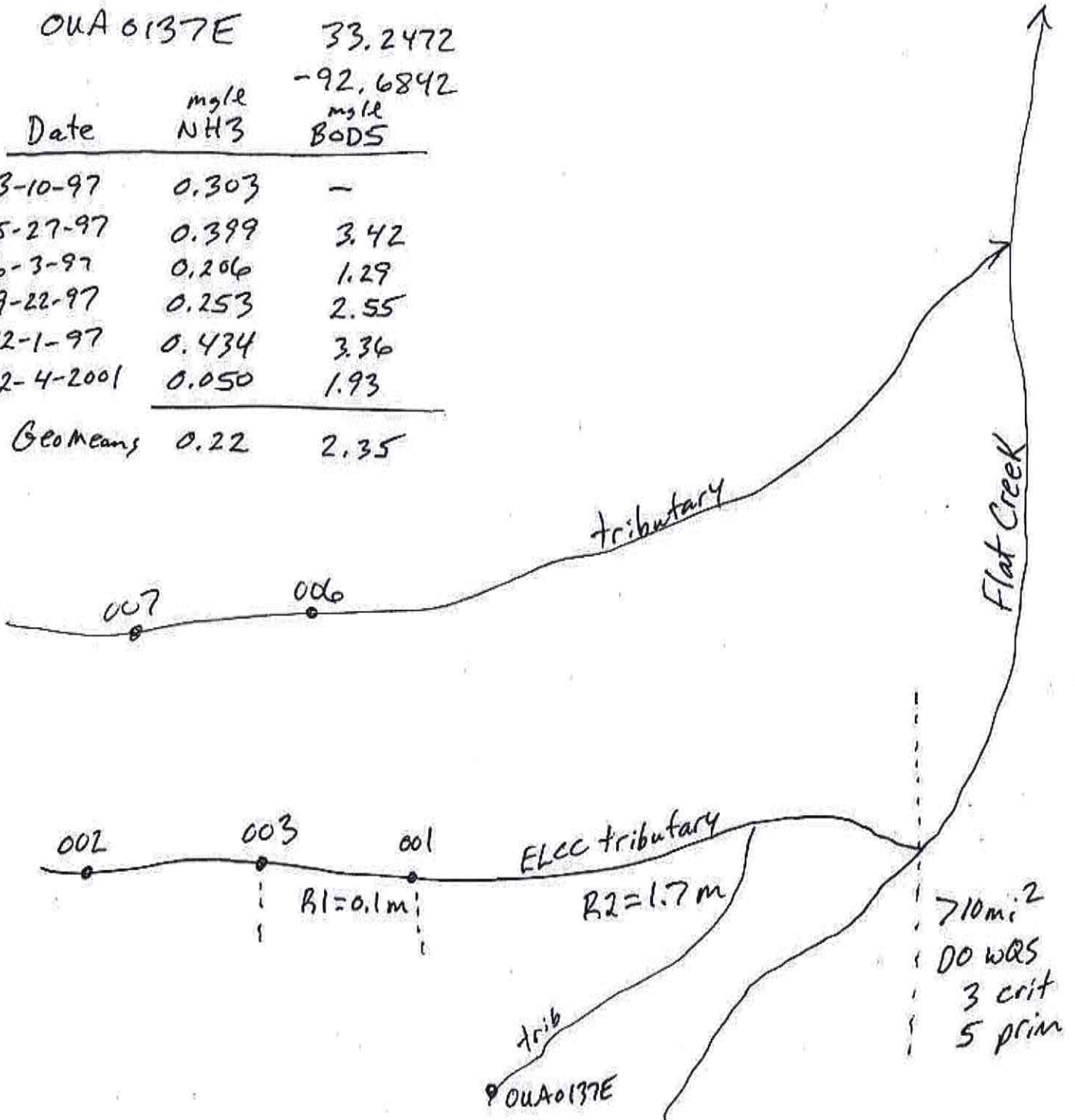
AFIN: _____ Permit No.: AR0000752
 Date: 12-9-2015 By: Byrum
 Project: Outfall 001/003 model
 Sheet _____ of _____

Printed on recycled content paper
ADEQ Engineers/Geologists/Field - Revised 2016

OUA 0137E 33.2472

-92.6842

Date	mg/l NH ₃	mg/l BOD ₅
3-10-97	0.303	-
5-27-97	0.399	3.42
6-3-97	0.206	1.29
9-22-97	0.253	2.55
12-1-97	0.434	3.36
12-4-2001	0.050	1.93
Geomeans	0.22	2.35



Model Input Data

Facility Name: El Dorado Chemical Company (Outfalls 001 and 003)

Permit Number: AR0000752

Outfall Coordinates: 33° 15' 33.8" N; 92° 41' 14.2" W (Outfall 001)

33° 15' 38" N; 92° 41' 07" W (Outfall 003)

W.S. Drainage Area (mi²) : less than 10 square miles at outfall, until 1.7 miles

downstream of outfall 001 where watershed becomes greater than 10 square miles.

Ecoregion: Gulf Coastal

	Critical Season (May-Oct.)		Primary Season (Nov.-Apr.)	
	Reach 1	Reach 2	Reach 1	Reach 2
D.O. Standard (mg/L)	2.0	3.0	5.0	5.0
Temp. Standard (°C)	30	30	22	22
Q stream (cfs)	0.026	4.37	1.0	5.37
Velocity stream (fps)	0.01	0.19	0.10	0.25
Depth stream (ft)	0.12	0.89	0.50	0.75

Modeled Flow Rate (MGD): Outfall 001 = 2.8 MGD, Outfall 003 = 0.017 MGD

Planning Segment: 2D

Receiving Stream: Unnamed tributary, thence to Flat Creek

HUC + reach code: 08040201 + 606

Permit type: Industrial

Engineer: SB

Date: 5-12-2016

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)	0.5	MOA
K _a (1/day)	39.1 (critical season) 11.5 (primary season)	Calculated by Model using O'Conner Dobbins

Reach 2

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
K _a (1/day)	6.6 (critical season) 9.9 (primary season)	Calculated by Model using O'Conner Dobbins

Engineer: SB

Date: 5-12-2016

Critical Season

Quick Calculator

Texas Original Default values about 80th percent values

	0.088886	0.5	0.492814	0.4	22.82883	0.1	Accum
	FPS		Feet		Feet		MGD
<input type="text" value="0"/> Headwater in CFS							
<input type="text" value="0.017"/> Discharger 1 in MGD	Reach 1 Velocity	<input type="text" value="0.014"/>	Depth	<input type="text" value="0.115"/>	Width	<input type="text" value="15.867"/>	<input type="text" value="0.017"/>
<input type="text" value="2.8"/> Discharger 2 in MGD	Reach 2 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 3 in MGD	Reach 3 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 4 in MGD	Reach 4 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 5 in MGD	Reach 5 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 6 in MGD	Reach 6 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 7 in MGD	Reach 7 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 8 in MGD	Reach 8 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 9 in MGD	Reach 9 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>
<input type="text"/> Discharger 10 in MGD	Reach 10 Velocity	<input type="text" value="0.186"/>	Depth	<input type="text" value="0.888"/>	Width	<input type="text" value="26.450"/>	<input type="text" value="2.817"/>

CFS is MGD

MGD is CFS

BVC

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*                               SIMPLIFIED METHOD PROGRAM                               *
*                               COMPLETE INPUT LISTING                               *
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752-C 5/12/2016

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

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Name of receiving stream ----- UnTrib/FlatCreek
Number of discharges ----- 2
Number of reaches ----- 2
Reaeration type ----- O'Connor-Dobbins
Run title ----- EDCC_Critical

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

Parameter	Value	Comment
Flow (cfs)	0.000	
Temperature (°C)	30.000	
Dissolved Oxygen (mg/l)	6.525	75%sat erstudy
5-Day BOD (mg/l)	2.350	OUA137E
Ult. CBOD / 5-Day BOD	2.300	
pH (su)	7.000	
Ammonia (mg/l)	0.220	OUA137E
Alkalinity (mg/l)	-0.000	

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

Number of Discharges = 2

For Discharge Number 1 (EDCCoutfall 003)

Parameter	Value	Comment
Flow (MGD)	0.017	Design Q =0.017
Temperature (°C)	30.000	Reg. 2
Dissolved Oxygen (mg/l)	4.000	permit limit
5-Day BOD (mg/l)	10.000	permit limit
Ult. CBOD / 5-Day BOD	2.300	epa guidance
pH (su)	7.000	assumed
Ammonia (mg/l)	2.430	WLA from TMDL
Alkalinity (mg/l)	-0.000	
Beginning of Reach Number	1.000	

For Discharge Number 2 (EDCCoutfall 001)

Parameter	Value	Comment
Flow (MGD)	2.800	permit
Temperature (°C)	30.000	Reg. 2
Dissolved Oxygen (mg/l)	4.000	permit limit
5-Day BOD (mg/l)	20.000	CONSERV assume
Ult. CBOD / 5-Day BOD	2.300	epa guidance
pH (su)	7.000	assumed neutral
Ammonia (mg/l)	2.430	WLA from TMDL
Alkalinity (mg/l)	-0.000	
Beginning of Reach Number	2.000	

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

Number of Reaches = 2
 Reaeration Type is O'Connor-Dobbins

For Reach Number 1

Parameter	Value	Comment
Length (mile)	0.100	
Velocity (fps)	0.014	epa spreadsheet
Slope (ft/mile)	-0.000	
Average Depth (ft)	0.115	epa spreadsheet
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)	0.900	k20=0.5
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)	39.139
Temperature-corrected reaeration rate (1/day)	49.663
Calculated reach-averaged width (ft)	16.324

For Reach Number 2

Parameter	Value	Comment
Length (mile)	1.900	
Velocity (fps)	0.186	epa spreadsheet
Slope (ft/mile)	-0.000	
Average Depth (ft)	0.888	epa spreadsheet
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)	1.720	k20=1.0
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)	6.649
Temperature-corrected reaeration rate (1/day)	8.436
Calculated reach-averaged width (ft)	26.368

--*-*-* Results for UnTrib/FlatCreek *-*-*-*-*

Discharge is to -- UnTrib/FlatCreek
 Run Title is -- EDCC_Critical

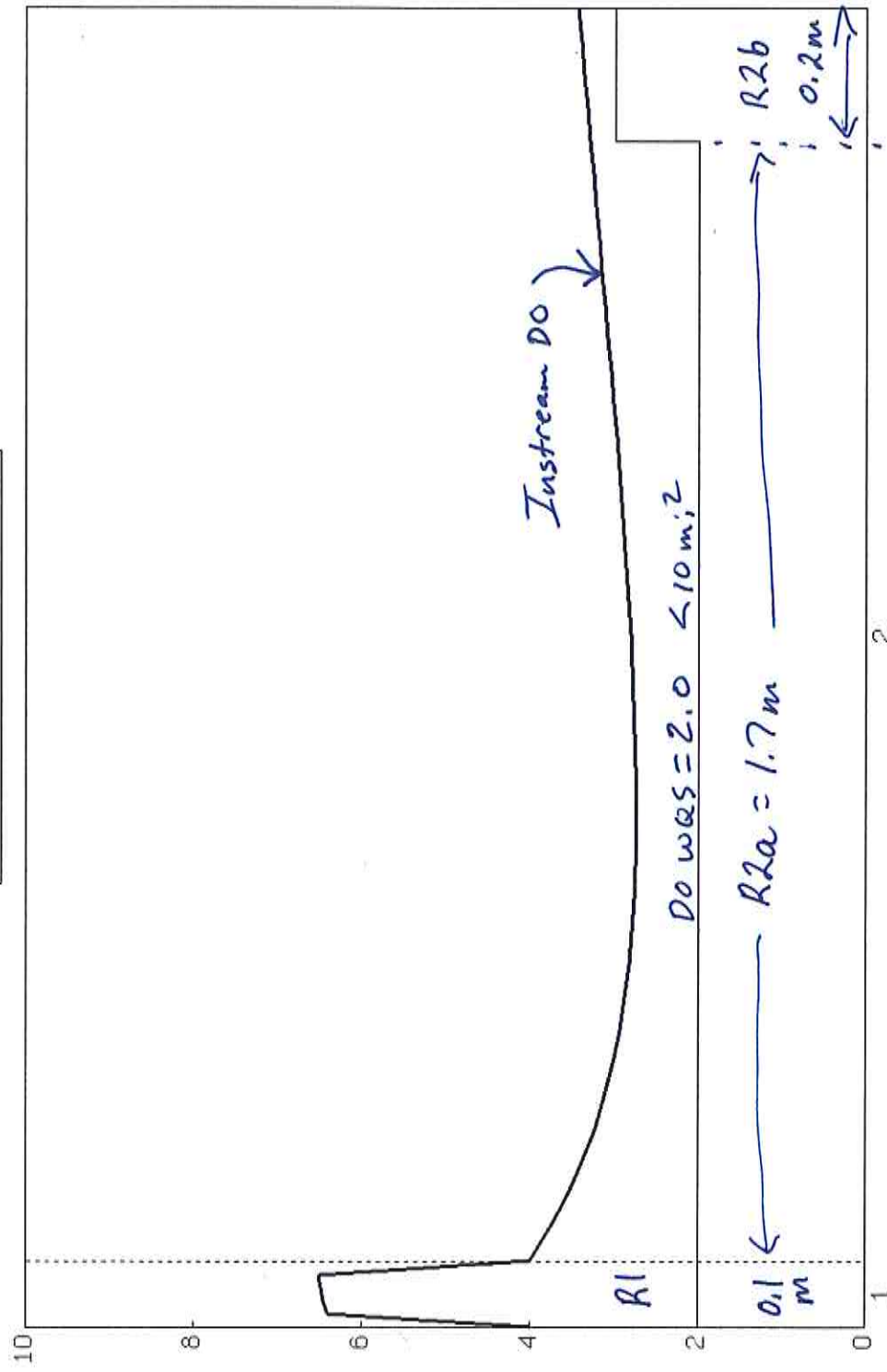
River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
2.000	4.000		23.000		2.430	
1.980	6.399		21.763		2.254	
1.960	6.459	<i>R1</i>	20.593		2.090	
1.940	6.486		19.485		1.938	
1.920	6.511		18.437		1.797	
1.900	4.015		45.828		2.425	
1.850	3.769	<i>R2a</i>	45.353		2.391	
1.800	3.561		44.884		2.358	
1.750	3.386		44.420		2.324	
1.700	3.241		43.960		2.292	
1.650	3.121		43.505		2.259	

1.600	3.022	43.055	2.227
1.550	2.943	42.609	2.196
1.500	2.880	42.169	2.165
1.450	2.831	41.732	2.135
1.400	2.795	41.300	2.105
1.350	2.769	40.873	2.075
1.300	2.753	40.450	2.046
1.250	2.745	40.031	2.017
1.200	2.743	39.617	1.989
1.150	2.747	39.207	1.960
1.100	2.757	38.802	1.933
1.050	2.771	38.400	1.906
1.000	2.788	38.003	1.879
0.950	2.809	37.609	1.852
0.900	2.832	37.220	1.826
0.850	2.858	36.835	1.801
0.800	2.886	36.454	1.775
0.750	2.915	36.077	1.750
0.700	2.946	35.703	1.726
0.650	2.977	35.334	1.701
0.600	3.010	34.968	1.677
0.550	3.043	34.607	1.654
0.500	3.078	34.248	1.630
0.450	3.112	33.894	1.607
0.400	3.147	33.543	1.585
0.350	3.182	33.196	1.562
0.300	3.217	32.853	1.540
0.250	3.252	32.513	1.519
0.200	3.288	32.176	1.497
0.150	3.323	31.843	1.476
0.100	3.358	31.514	1.455
0.050	3.393	31.188	1.435
-0.000			
-0.000	3.428	30.865	1.415

R2a

R2b

Dissolved Oxygen Profile
EDCC_Critical



Max unionized ammonia = 0.0194 mg/L

DO (mg/L)

BVC

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

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752-P

5/12/2016

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

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Name of receiving stream ----- UnTrib/Haynes Creek
Number of discharges ----- 2
Number of reaches ----- 2
Reaeration type ----- O'Connor-Dobbins
Run title ----- EDCC_Primary

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

Parameter	Value	Comment
Flow (cfs)	0.970	seasonalfishery
Temperature (°C)	22.000	Reg. 2
Dissolved Oxygen (mg/l)	6.525	75% sat erstudy
5-Day BOD (mg/l)	2.350	OUA137E
Ult. CBOD / 5-Day BOD	2.300	epa guidance
pH (su)	7.000	assumed
Ammonia (mg/l)	0.220	OUA137E
Alkalinity (mg/l)	-0.000	

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

Number of Discharges = 2

For Discharge Number 1 (EDCCoutfall 003)

Parameter	Value	Comment
Flow (MGD)	0.017	DesignQ = 0.017
Temperature (°C)	22.000	Reg. 2
Dissolved Oxygen (mg/l)	2.000	permit limit
5-Day BOD (mg/l)	10.000	permit limit
Ult. CBOD / 5-Day BOD	2.300	epa guidance
pH (su)	7.000	
Ammonia (mg/l)	5.500	WLA from TMDL
Alkalinity (mg/l)	-0.000	
Beginning of Reach Number	1.000	

For Discharge Number 2 (EDCCoutfall 001)

Parameter	Value	Comment
Flow (MGD)	2.800	permit
Temperature (°C)	22.000	reg.2
Dissolved Oxygen (mg/l)	5.000	permit limit
5-Day BOD (mg/l)	20.000	cserv assumptn
Ult. CBOD / 5-Day BOD	2.300	epa guidance
pH (su)	7.000	
Ammonia (mg/l)	5.500	WLA from TMDL
Alkalinity (mg/l)	-0.000	
Beginning of Reach Number	2.000	

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

Number of Reaches = 2
 Reaeration Type is O'Connor-Dobbins

For Reach Number 1

Parameter	Value	Comment
Length (mile)	0.100	
Velocity (fps)	0.100	epa spreadsheet
Slope (ft/mile)	-0.000	
Average Depth (ft)	0.500	epa spreadsheet
Temperature (°C)	22.000	Calculated
BOD Removal Rate (1/day)	0.400	MOA
NH3 Decay Rate (1/day)	0.400	MOA
Sediment Oxygen Demand (g/m ² /day)	0.600	k20=0.5
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)	11.538
Temperature-corrected reaeration rate (1/day)	12.101
Calculated reach-averaged width (ft)	19.926

For Reach Number 2

Parameter	Value	Comment
Length (mile)	1.900	
Velocity (fps)	0.250	to = expected W
Slope (ft/mile)	-0.000	
Average Depth (ft)	0.750	to = expected W
Temperature (°C)	22.000	Calculated
BOD Removal Rate (1/day)	0.400	MOA
NH3 Decay Rate (1/day)	0.400	MOA
Sediment Oxygen Demand (g/m ² /day)	1.120	k20=1.0
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)	9.930
Temperature-corrected reaeration rate (1/day)	10.415
Calculated reach-averaged width (ft)	28.400

--*-*-* Results for UnTrib/Haynes Creek *-*-*-*-*

Discharge is to -- UnTrib/Haynes Creek
 Run Title is -- EDCC_Primary

River Mile	DO Predicted	DO Observed	BOD Predicted	BOD Observed	NH3 Predicted	NH3 Observed
2.000	6.406		5.869		0.359	
1.980	6.621		5.838		0.357	
1.960	6.808	<i>R1</i>	5.807		0.355	
1.940	6.969		5.776		0.353	
1.920	7.108		5.745		0.351	
1.900	5.417		38.463		4.536	
1.850	5.434		38.257		4.511	
1.800	5.452	<i>R2a</i>	38.053		4.485	
1.750	5.468		37.849		4.459	
1.700	5.485		37.647		4.434	
1.650	5.501		37.446		4.409	

1.600	5.517	37.246	4.384
1.550	5.532	37.047	4.359
1.500	5.547	36.849	4.334
1.450	5.562	36.652	4.309
1.400	5.577	36.456	4.285
1.350	5.592	36.261	4.261
1.300	5.606	36.067	4.236
1.250	5.621	35.874	4.212
1.200	5.635	35.683	4.188
1.150	5.649	35.492	4.164
1.100	5.663	35.302	4.141
1.050	5.676	35.113	4.117
1.000	5.690	34.926	4.094
0.950	5.704	34.739	4.071
0.900	5.717	34.553	4.047
0.850	5.730	34.369	4.024
0.800	5.743	34.185	4.001
0.750	5.757	34.002	3.979
0.700	5.770	33.821	3.956
0.650	5.782	33.640	3.934
0.600	5.795	33.460	3.911
0.550	5.808	33.281	3.889
0.500	5.821	33.103	3.867
0.450	5.833	32.926	3.845
0.400	5.846	32.750	3.823
0.350	5.858	32.575	3.801
0.300	5.871	32.401	3.780
0.250	5.883	32.228	3.758
0.200	5.895	32.056	3.737
0.150	5.907	31.884	3.716
0.100	5.919	31.714	3.694
0.050	5.931	31.545	3.673
-0.000			
-0.000	5.943	31.376	3.653

R2a

R2b

Dissolved Oxygen Profile
EDCC_Primary

