

Bioassays of

Bray Mill Creek

Santa Rosa County, Florida

No NPDES Number

Sampled 3/25/96

June 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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Introduction

Bray Mill Creek, Santa Rosa County, Florida, no NPDES number, tests performed on 26 to 28 March, 1996.

Bray Mill Creek is a small sand bottom stream in northern Santa Rosa County with its headwaters northeast of the Town of Jay. It is a tributary to the Escambia River and is approximately 6.4 kilometers long. The surrounding land use is predominately oil fields and silviculture lands, although native forest biomes exist for the lower 2.4 kilometers along the creek. Historic problems in Bray Mill Creek include runoff from an oil refining plant, urban runoff from the Town of Jay, and domestic wastewater discharged from the Town of Jay WWTP. Toxicity bioassays were performed on a sample from this creek to support a biological reconnaissance performed on the creek by personnel from FDEP, Pensacola (summary from the biological reconnaissance draft document provided by Glenn Butts, FDEP, Pensacola).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample from Bray Mill Creek. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The tests results did not indicate toxicity (Table 1).

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample and numerous metals and several herbicides were identified (Table 2). Copper (8 µg/L), iron (8.48 mg/L), lead (12 µg/L), silver (0.09 µg/L), and zinc (99 µg/L) each exceeded its respective Class III surface water criterion of ≤ 3.6 µg/L copper, ≤ 1.0 mg/L iron, ≤ 0.54 µg/L lead, ≤ 0.07 µg/L silver, and ≤ 32.7 µg/L zinc (FAC 62-302.530).

Conclusion

The sample collected from Bray Mill Creek on March 25, 1996, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample from Bray Mill Creek, Santa Rosa County, Florida, no NPDES number, performed on 26 to 28 March,1996.

Facility:	**Bray Mill Creek**		**NPDES #**	**none**	Facility Type: **Other**
Location:	Headwaters north and west of Jay, Florida		Contact/District:	Glenn Butts/NW	
County:	Santa Rosa County		Test type:	static acute screen	Receiving Water: none
Sample Collection Date:	3/25/96	Time: 1000	# tests:	2	
Test Beginning Date:	3/26/96	Time: 1330	Chlorination Type:	non-chlorinated	
Test Ending Date:	3/28/96	Time: 1330			**Page 1 of 1**

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[A] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.3	-	8.3	24.4	-	24.9	8.2	-	7.3	195	200
Control B	0/20	5	5	5	-	-	8.3	-	-	24.8	-	-	7.2	-	205
Control C	0/20	5	5	5	-	-	8.4	-	-	24.7	-	-	7.3	-	205
Control D	0/20	5	5	5	-	-	8.4	-	-	24.7	-	-	7.3	-	210
100% A	20/0	5	5	5	6.9	-	7.6	24.6	-	24.7	8.4	-	7.4	60	65
100% B	20/0	5	5	5	-	-	7.6	-	-	24.7	-	-	7.3	-	65
100% C	20/0	5	5	5	-	-	7.4	-	-	24.7	-	-	7.3	-	65
100% D	20/0	5	5	5	-	-	7.4	-	-	24.7	-	-	7.3	-	65

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 24.4-24.7°C.

Organism: ***Cyprinella leedsi*** Age: 12 days

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[B] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	8.0	8.3	8.5	25.5	23.8	24.5	7.6	7.6	7.6	255	255
Control B	0/500	5	5	5	8.0	8.3	8.5	25.6	23.8	24.5	7.6	7.7	7.5	255	250
Control C	0/500	5	5	5	8.0	8.3	8.5	25.6	23.9	24.4	7.6	7.8	7.4	255	250
Control D	0/500	5	5	5	8.0	8.3	8.5	25.6	24.1	24.5	7.6	7.8	7.5	255	250
100% A	500/0	5	5	5	6.5	7.0	6.9	24.7	23.8	24.5	8.2	7.6	7.6	55	60
100% B	500/0	5	5	5	6.5	7.0	6.9	24.8	23.7	24.4	8.2	7.7	7.5	55	55
100% C	500/0	5	5	5	6.4	7.0	6.8	25.0	23.7	24.4	8.3	7.8	7.3	55	55
100% D	500/0	5	5	5	6.4	7.0	6.8	25.1	23.9	24.5	8.3	7.8	7.3	55	55

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 24.5-26°C.

Total Residual CL2	mg/L	Method
Field:	not measured	
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	<0.017	0.00

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	120	125
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	15	15

Salinity	(ppt)
Control Water:	0
100% Sample:	0

Table 2. Results of chemical analyses on the effluent from Bray Mill Creek, sampled on March 25, 1996.

Metals

Aluminum	8.71	mg/L
Cadmium	0.12	µg/L[I]
Calcium	4.39	mg/L
Chromium	11	µg/L[I]
Copper	8	µg/L[I]
Iron	8.48	mg/L
Lead	12	µg/L[I]
Magnesium	1.81	mg/L
Nickel	4	µg/L[I]
Silver	0.09	µg/L[I]
Zinc	99	µg/L[I]

Pesticides and Herbicides

Bromacil	0.50	µg/L[I]
Hexazinone	0.20	µg/L[T]
Metolachlor	0.54	µg/L[I]

Base, Neutral, & Acid Extractable Organics

none detected

[I] Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

[T] Value reported is less than the criterion of detection.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bray Mill Creek (Escambia ~~County~~ SANTA ROSA COUNTY STREAM)
County: ~~Escambia~~ Santa Rosa
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL00 NA
LIMS Sample #: 133523 (sample log 4/1/96) LIMS Job #: 96-MAR-26-02-01

Sample Collection: Date 3-25-96 Time 1000
Test Beginning: Date 3-26-96 Time 1330
Test Ending: Date 3-28-96 Time 1330
Organism Batch #: 15 Diluent Batch #: 14
Organism Age: <24hours
Test Organism: Ceriodaphnia dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.5	8.2 @ 25.6 °C	108.6 @ 106.2 1438 @ 1409 @ 24.9 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.5 @ 23.5	8.2 @ 25.6 °C	106.6 @ 106.2 1415 @ 1409 @ 25.4 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.0	8.2 @ 25.0 °C	108.0 @ 106.2 1416 @ 1409 @ 25.0 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	A	5	5	5	8.3		8.3	24.4		24.9	8.2		7.3	195		200
Control	B	5	5	5			8.3			24.8			7.2			205
Control	C	5	5	5			8.4			24.7			7.3			205
Control	D	5	5	5			8.4			24.7			7.3			210
100%	A	5	5	5	6.9		7.6	24.6		24.7	8.4		7.4	60		65
100%	B	5	5	5			7.6			24.7			7.3			65
100%	C	5	5	5		*7.4	~~7.6~~			24.7			7.3			65
100%	D	5	5	5		*7.4	~~7.6~~			24.7			7.3			65
Measured/Loaded by:		MF	MF	MF	TR		JN	TR		JN	TR		JN	TR		JN
Recorded by:		JR	MF	MF	JLS		JLS	JLS		JLS	JLS		JLS	JLS		JLS

* 3-28-96 recorded the wrong numbers. JLS the number was not stabilized

Investigators' Signatures

Reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			not measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	JLS
Alkalinity (mg/L as $CaCO_3$):	—	75	15	Hach	TR
Hardness (mg/L as $CaCO_3$):	—	85	15	Hach	TR
Total ammonia (mg/L as N):	—	<0.017	<0.017	Orion	JN

Ammonia Meter #98136 — Ammonia Meter Slope: ~~<0.017~~ −56.8 — Ammonia Blank: <0.017 — Control Salinity: 0 ppt — Sample Salinity: 8 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bray Mill Creek
County: ~~Escambia~~ Santa Rosa (District County 5/10/96mf)
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL00 NA
LIMS Sample #: 133523 (2 samples log 4-1-96) LIMS Job #: 96-MAR-26-0201

Sample Collection: Date 3-25-96 Time 1000
Test Beginning: Date 3-26-96 Time 1330
Test Ending: Date 3-28-96 Time 1330
Organism Batch #: *1819 Diluent Batch #: 14
Organism Age: ~~48 hrs~~ *10 days old
Test Organism: Cyprinella leedsi

*3 incubators #s

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.5	8.2 @ 25.6 °C	1086 @ 106.2 1424 @ 1409 @ 24.9 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.5 @ 23.5	8.1 @ 25.6 °C	106.6 @ 106.2 1415 @ 1409 @ 25.4 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.0	8.2 @ 25.0 °C	108.0 @ 106.2 1416 @ 1409 @ 25.0 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	210	5	5	5	8.0	8.3	8.5	25.5	23.8	24.5	7.6	7.6	7.6	255	245	255
Control	45	5	5	5	8.0	8.3	8.5	25.6	23.8	24.5	7.6	7.7	7.5	255	250	250
Control	198	5	5	5	8.0	8.3	8.5	25.6	23.9	24.4	7.6	7.8	7.4	255	250	250
Control	333	5	5	5	8.0	8.3	8.5	25.6	24.1	24.5	7.6	7.8	7.5	255	250	250
100%	21	5	5	5	6.5	7.0	6.9	24.7	23.8	24.5	8.2	7.6	7.6	55	55	60
100%	1272	5	5	5	6.5	7.0	6.9	24.8	23.7	24.4	8.2	7.7	7.5	55	55	55
100%	44	5	5	5	6.4	7.0	6.8	25.0	23.7	24.4	8.3	7.8	7.3	55	55	55
100%	610	5	5	5	6.4	7.0	6.8	25.1	23.9	24.5	8.3	7.8	7.3	55	55	55
Measured/Loaded by:		TM	TM	TR	TR	MF	JN	TR	MF	JN	TR	MF	JN	TR	MF	JN
Recorded by:		TR	MF	MF	JLS	JN	JLS	JLS	JN	JLS	JLS	JN	JLS	JLS	JN	JLS

Investigators' Signatures

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reviewer

form updated 5/05/95

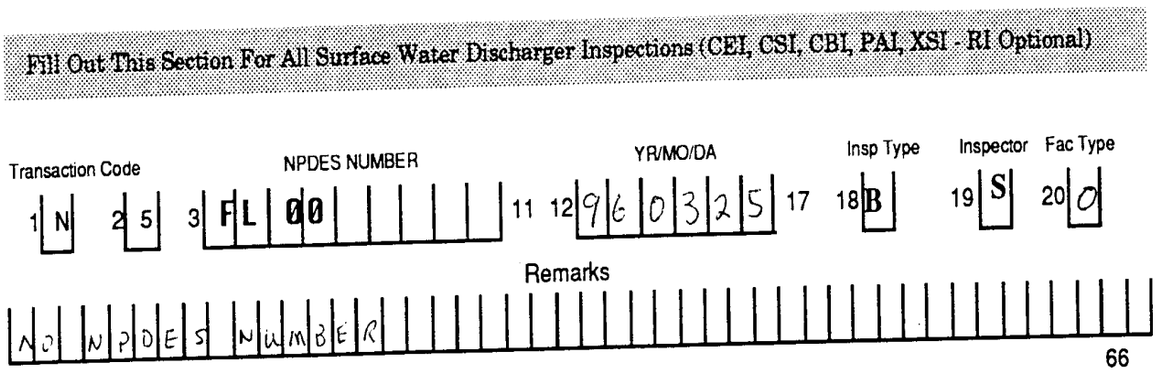
Salt Water: Well Water | 20% Min Water

Water Quality Parameters

		Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		not measured		
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.05 DR-100	JLS
Alkalinity (mg/L as $CaCO_3$):	120	—	15 Hach	TR
Hardness (mg/L as $CaCO_3$):	125	—	15 Hach	TR
Total ammonia (mg/L as N):	<0.017	—	<0.017 Orion	JN

Ammonia Meter #98136 Meter Slope: -56.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of Bray Mill Creek sampled on March 25, 1996, no NPDES number.



The Priority Pollutants Analysis for the Bioassay of Bray Mill Creek sampled on March 25, 1996, no NPDES number.

