



ASSESSMENT OF NEARSHORE  
WATER QUALITY PROBLEM AREAS  
IN WESTERN LAKE ERIE  
1978-1979

by

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Prepared for

U.S. Environmental Protection Agency  
National Great Lakes Program Office, Region V  
Chicago, Illinois

Grant No. R005351-01  
Contract No. R005368-01

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COLUMBUS, OHIO

July 1980

This report is very similiar to Technical Report # 234. However, this report is more limited, a) the appendix includes violations for only 5 of the 8 cruises, b) and there are no ammonia violations listed.

ASSESSMENT OF NEARSHORE WATER QUALITY  
PROBLEM AREAS IN WESTERN LAKE ERIE  
1978-1979

Introduction

The nearshore zone of Lake Erie is where the greatest interaction between water quality and water users takes place. These waters are the source of all water for public and industrial water supply. It is the site of virtually all recreational use and it is the most important area for the propagation and support of all aquatic life forms. With the exception of that portion of atmospheric deposition falling on the main body of the lake, the nearshore zone is the recipient of most waste input. For this reason, these waters are the first to show signs of degradation and are the first indicators of progress in abating pollution.

The Center for Lake Erie Area Research (CLEAR) and the Water Resources Center (WRC) at The Ohio State University undertook an extensive study of the nearshore waters of western Lake Erie in 1978 and 1979. Seventy-seven (77) stations (Figures 1 and 2) were visited on three consecutive days (weather permitting) during each of eight cruises.

Cruise 1	April 14-29, 1978 (104-119)
Cruise 2	June 26-July 12, 1978 (177-193)
Cruise 3	August 23-September 11, 1978 (235-254)
Cruise 4	October 3-17, 1978 (276-290)
Cruise 5	March 24-April 15, 1979 (080-105)
Cruise 6	July 25-August 5, 1979 (206-217)
Cruise 7	September 9-23, 1979 (252-266)
Cruise 8	October 9-23, 1979 (282-296)

The following report documents those areas along the Michigan and Ohio shoreline of western Lake Erie which have persistent water quality problems. Water quality problems are here defined as measured values for specific parameters which violate water quality objectives or standards established by the International Joint Commission or by the States of Ohio and Michigan in cooperation with the U.S. Environmental Protection Agency. The objectives and standards considered in this report are summarized in Table 1. Further detail on the IJC objectives and state standards is contained in the following publications:

International Joint Commission. 1978. Great Lakes Water Quality Agreement of 1978. 14 p. 12 annexes.

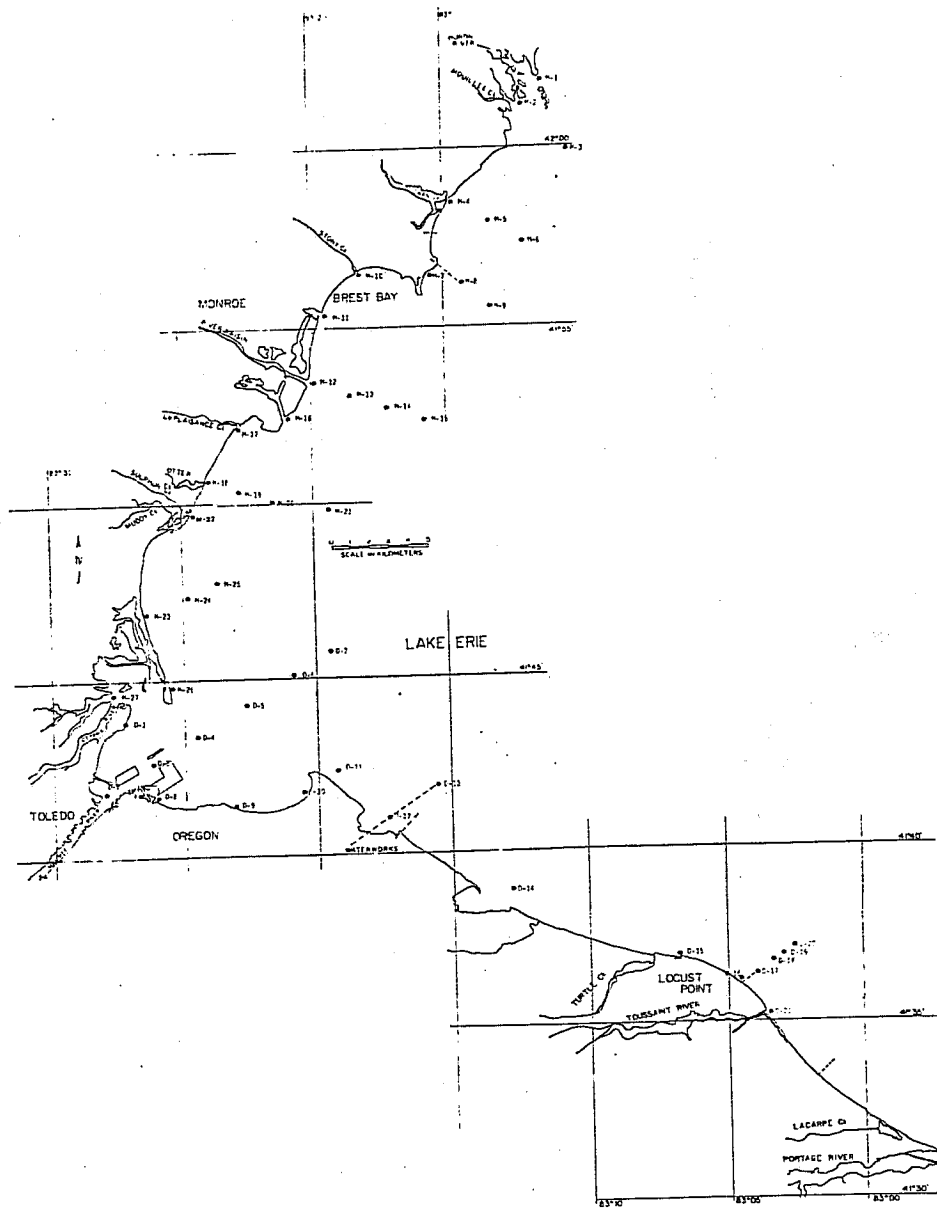


FIGURE 1. NEARSHORE STATION LOCATION MAP FOR WESTERN LAKE ERIE (WEST HALF)

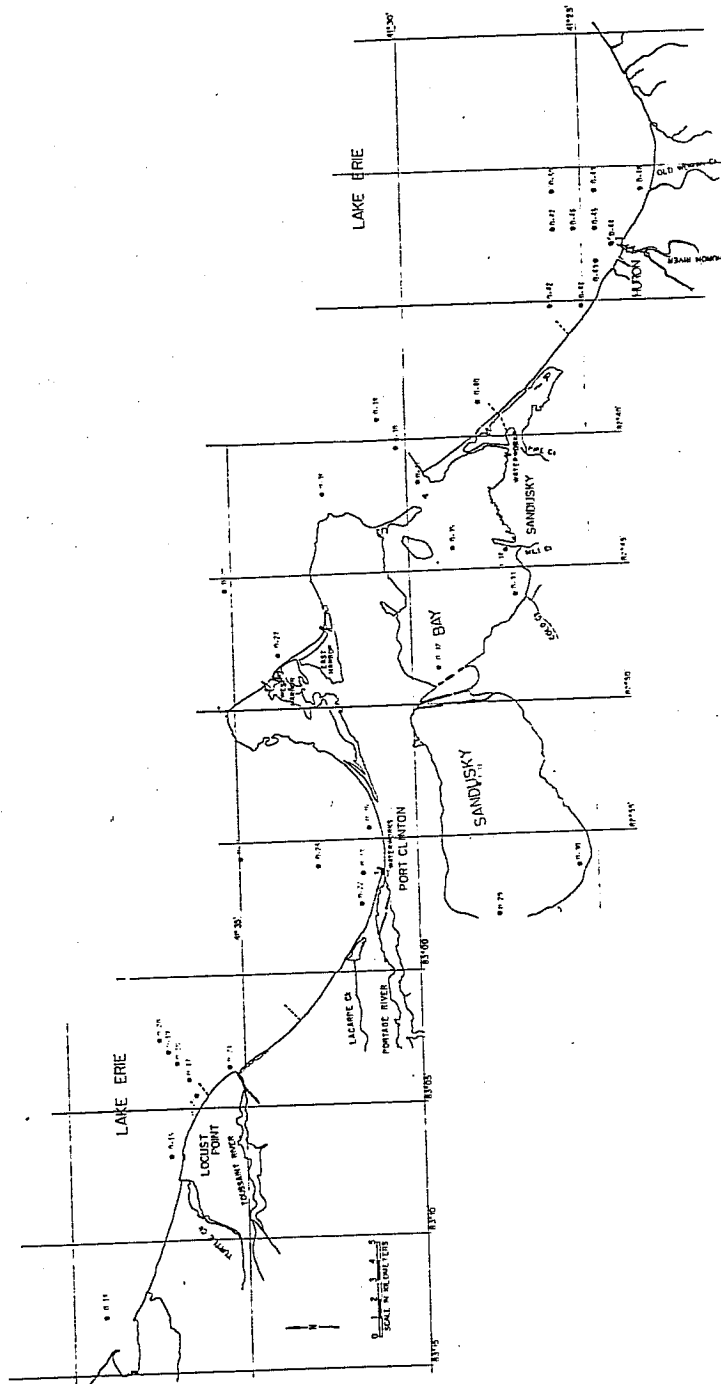


FIGURE 2. NEARSHORE STATION LOCATION MAP FOR WESTERN LAKE ERIE (EAST HALF)

TABLE 1  
WATER QUALITY OBJECTIVES AND STANDARDS  
FOR WESTERN LAKE ERIE

Parameter	IJC (1978) WATER QUALITY Objectives	OHIO EPA (1978) WATER QUALITY STANDARDS		MICHIGAN DNR (1973) WATER QUALITY STANDARDS
		Lake Erie	Excepted Areas	Lake Erie
Dissolved Oxygen	6.0 mg/l	6.0 mg/l	4.0 mg/l	6.0 mg/l; 7 mg/l (P)
pH	6.5-9.0	6.5-9.0	6.5-9.0	6.7-8.5
Total Dissolved Solids	200 mg/l	200 mg/l	1500 mg/l	200 mg/l
Conductivity	308 $\mu$ mhos/cm	320 $\mu$ mhos/cm	2400 $\mu$ mhos/cm	-
Total Phosphorus	0.5 mg/l (1)	1 mg/l (1)	1 mg/l (1)	-
Total Ammonia	500 $\mu$ g/l (NH <sub>3</sub> )	6.5 mg/l (N)	13 mg/l (N)	-
Nitrate	-	10 mg/l	-	-
Nitrite	-	100 mg/l	100 mg/l	-
Chloride	-	250 mg/l	-	50 mg/l (2)
Fluoride	1200 $\mu$ g/l	1800 $\mu$ g/l	2000 $\mu$ g/l	-
Sulfate	-	250 $\mu$ g/l	-	-
Cadmium (Total)	0.2 $\mu$ g/l	1.2 $\mu$ g/l	12 $\mu$ g/l	12 $\mu$ g/l (P)
Chromium (Total)	50 $\mu$ g/l	50 $\mu$ g/l	100 $\mu$ g/l	100 $\mu$ g/l (P)
Copper (Total)	5 $\mu$ g/l	5 $\mu$ g/l	10 $\mu$ g/l	-
Iron (Total)	300 $\mu$ g/l	300 $\mu$ g/l (dissol.) 1000 $\mu$ g/l	1000 $\mu$ g/l	300 $\mu$ g/l (P)
Lead (Total)	25 $\mu$ g/l	30 $\mu$ g/l	30 $\mu$ g/l	30 $\mu$ g/l (P)
Manganese	-	50 $\mu$ g/l	-	-
Nickel (Total)	25 $\mu$ g/l	25 $\mu$ g/l	200 $\mu$ g/l	-
Zinc (Total)	30 $\mu$ g/l	30 $\mu$ g/l	55 $\mu$ g/l	-
Arsenic	50 $\mu$ g/l	50 $\mu$ g/l	100 $\mu$ g/l	100 $\mu$ g/l (P)
Mercury (Total)	0.2 $\mu$ g/l (Dissol.)	0.2 $\mu$ g/l	0.2 $\mu$ g/l	.05 $\mu$ g/l (P)
Selenium (Total)	10 $\mu$ g/l	10 $\mu$ g/l	50 $\mu$ g/l	-
Cyanide	-	25 $\mu$ g/l	25 $\mu$ g/l	5 $\mu$ g/l (P)
Phenol	1 $\mu$ g/l	1 $\mu$ g/l	10 $\mu$ g/l	-
Fecal Coliforms	-	200/100 ml	-	200/100 ml (3) 1000/100 ml (4)
PCB	0.1 mg/l (5)			

(1) point source discharges  
(2) monthly average

(3) total body contact  
(4) other waters

(P) proposed  
(5) fish tissues

Ohio Environmental Protection Agency. 1978. Water Quality Standards. Admin. Code Chapter 3745-1. 117 p.

Michigan Department of Natural Resources. 1978. Water Resources Commission General Rules, Part 4. Water Quality Standards (proposal). 13 p.

### Assessment

Data processed thus far, April 1978 through April 1979 (cruises 1-5) indicate that water quality objectives and/or standards for 17 parameters were violated in the nearshore zone of western Lake Erie. Table 2 contains a summary of violations grouped by water quality parameter. A detailed listing of the station, date and measure value for each violation, grouped by parameter for Cruises 1-5, is presented in the Appendix.

The highest percentage of observed violations were the metals group, particularly iron, zinc, copper, cadmium and nickel. Over one-third of all samples analyzed exceed the IJC objectives limits for these five elements. In addition, chromium and manganese levels exceeded the objectives in over 10 percent of the samples. Dissolved solids were also relatively high with over 20 percent of all samples above the conductivity objective. In areas of high primary productivity, pH was a problem with over 18 percent of all samples above the 9.0 su limit. Dissolved oxygen fell below the 6.0 mg/l level in less than four percent of the samples while fecal coliforms were above 200 cells/100 ml in less than three percent of the samples. With the exception of total phosphorus, which exceeded the 1000 ug/l limit in 1.1 percent of the samples, all other non-metal parameters violated the objectives in less than one percent of the samples.

Table 3 contains a list of the seven identified water quality problem areas in the nearshore zone of western Lake Erie:

1. Pointe Mouillee to Stony Point, Michigan
2. River Raisin Mouth/Monroe, Michigan
3. Maumee River Mouth/Maumee Bay, Michigan and Ohio
4. Toussaint River/Locust Point, Ohio
5. Portage River Mouth/Port Clinton, Ohio
6. Sandusky River Mouth/Sandusky Bay, Ohio
7. Huron River Mouth/Huron, Ohio

Table 3 also identifies the most persistent violations at each area and magnitude of the problem.

The Toledo, Ohio area in the vicinity of the Maumee River mouth and Maumee Bay appears to be the most impacted area in western Lake Erie. More water quality parameters are degraded to a greater degree in this area than any of the other six problem areas. Oxygen is at times

TABLE 2

SUMMARY OF WATER QUALITY OBJECTIVES AND STANDARDS VIOLATIONS  
Western Lake Erie - April 1978 through April 1979

Parameter	Samples Processed		Samples with Violations		VIOLATIONS											
	No.	%	No.	%	IJC			MDNR			OEPA Norm			OEPA EX		
					No.	%	No.	%	No.	%	No.	%	No.	%		
Dissolved Oxygen	1637		59	3.6	59	3.6	14	0.9	45	2.8	10	0.6				
pH	1637		306	18.7	135	8.3	241	14.7	65	4.0	10	0.6				
Conductivity	1637		354	21.6	354	21.6	-	-	230	14.1	0	0.0				
Total Phosphorus	1637		18	1.1	18	1.1	-	-	1	0.1	1	0.1				
Ammonia	1637		13	0.8	13	0.8	-	-	0	0.0	0	0.0				
Chloride	1637		0	0.0	-	-	-	-	0	0.0	-	-				
Flouride	1637		0	0.0	0	0.0	-	-	0	0.0	0	0.0				
Sulfate	1637		5	0.3	-	-	-	-	5	0.3	-	-				
Phenol	309		0	0.0	0	0.0	-	-	0	0.0	0	0.0				
Fecal Coliforms	1637		45	2.8	45	2.8	11	0.7	34	2.1	-	-				
Total Arsenic	381		0	0.0	0	0.0	0	0.0	0	0.0	0	0.0				
Total Cadmium	381		44	11.6	182	47.8	3	0.8	36	9.5	1	0.3				
Total Chromium	381		196	51.4	44	11.6	0	0.0	34	8.9	0	0.0				
Total Copper	381		289	75.9	196	51.4	-	-	113	29.7	7	1.8				
Total Iron	381		3	0.8	289	75.9	108	28.4	84	22.1	15	3.9				
Total Mercury	381		65	17.1	3	0.8	0	0.0	3	0.8	0	0.0				
Total Manganese	381		9	2.4	-	-	-	-	65	17.1	-	-				
Total Lead	381		6	1.6	9	2.4	7	1.8	1	0.3	0	0.0				
Total Selenium	381		226	59.3	6	1.6	-	-	5	1.3	0	0.0				
Total Zinc	381		134	35.2	226	59.3	-	-	131	34.4	6	1.6				
Total Nickel	381		134	35.2	134	35.2	-	-	84	22.1	0	0.0				



TABLE 3

PROBLEM AREAS IN WESTERN LAKE ERIE  
April 1978 through April 1979

River Raisin Mouth/Monroe, Michigan

Dissolved oxygen: < 5.0 mg/l  
 pH: > 9.1 su  
 Conductivity: > 600  $\mu$ mhos/cm  
 Fecal coliforms: > 900/100 ml  
 Cadmium: > 5  $\mu$ g/l  
 Chromium: > 50  $\mu$ g/l  
 Copper: > 2000  $\mu$ g/l  
 Iron: > 6000  $\mu$ g/l  
 Lead: > 30  $\mu$ g/l  
 Selenium: > 50  $\mu$ g/l  
 Zinc: > 300  $\mu$ g/l  
 Nickel: > 200  $\mu$ g/l

Pointe Mouillee to Stony Point, Michigan

Dissolved oxygen: < 6.0 mg/l  
 pH: > 9.3 su  
 Conductivity: > 450  $\mu$ mhos/cm  
 Ammonia: > 600  $\mu$ g/l  
 Fecal coliforms: > 450/100 ml  
 Cadmium: > 35  $\mu$ g/l  
 Chromium: > 60  $\mu$ g/l  
 Copper: > 4000  $\mu$ g/l  
 Iron: > 5000  $\mu$ g/l  
 Lead: > 65  $\mu$ g/l  
 Zinc: > 150  $\mu$ g/l  
 Nickel: > 100  $\mu$ g/l

TABLE 3, continued

PROBLEM AREAS IN WESTERN LAKE ERIE  
April 1978 through April 1979

<u>Maumee River Mouth/Maumee Bay, Michigan and Ohio</u>	<u>Toussaint River Mouth/Locust Point, Ohio</u>
Dissolved oxygen: <2.5 mg/l	Dissolved oxygen: <6.0 mg/l
pH: > 9.4 su	Conductivity: > 400 $\mu$ mhos/cm
Conductivity: > 700 $\mu$ mhos/cm	Cadmium: >100 $\mu$ g/l
Ammonia: > 1200 $\mu$ g/l	Chromium: > 75 $\mu$ g/l
Total phosphorus: >1000 $\mu$ g/l	Copper: >1200 $\mu$ g/l
Fecal coliforms: >10000/100 ml	Iron: >3500 $\mu$ g/l
Cadmium: >100 $\mu$ g/l	Mercury: >0.45 $\mu$ g/l
Chromium: > 100 $\mu$ g/l	Manganese: >100 $\mu$ g/l
Copper: > 350 $\mu$ g/l	Zinc: >200 $\mu$ g/l
Iron: > 8000 $\mu$ g/l	Nickel: >100 $\mu$ g/l
Manganese: >150 $\mu$ g/l	
Lead: > 40 $\mu$ g/l	
Selenium: >15 $\mu$ g/l	
Zinc: >600 $\mu$ g/l	
Nickel: >100 $\mu$ g/l	

TABLE 3, continued

PROBLEM AREAS IN WESTERN LAKE ERIE  
April 1978 through April 1979

Portage River Mouth/Port Clinton, Ohio

Dissolved oxygen: <5.5 mg/l  
 Conductivity: >400  $\mu$ mhos/cm  
 Fecal coliforms: >5000/100 ml  
 Cadmium: >15  $\mu$ g/l  
 Chromium: >75  $\mu$ g/l  
 Copper: >150  $\mu$ g/l  
 Iron: >2000  $\mu$ g/l  
 Mercury: >0.25  $\mu$ g/l  
 Manganese: >75  $\mu$ g/l  
 Selenium: > 10  $\mu$ g/l  
 Zinc: >200  $\mu$ g/l  
 Nickel: >100  $\mu$ g/l

Sandusky River Mouth/Sandusky Bay, Ohio

Dissolved oxygen: <2.5 mg/l  
 pH: >9.3 su  
 Conductivity: >500  $\mu$ mhos/cm  
 Sulfate: >300  $\mu$ g/l  
 Fecal coliforms: >3500/100 ml  
 Cadmium: >100  $\mu$ g/l  
 Chromium: >75  $\mu$ g/l  
 Copper: >2000  $\mu$ g/l  
 Iron: >8000  $\mu$ g/l  
 Manganese: >200  $\mu$ g/l  
 Selenium: >10  $\mu$ g/l  
 Zinc: >200  $\mu$ g/l  
 Nickel: >200  $\mu$ g/l

TABLE 3, continued

PROBLEM AREAS IN WESTERN LAKE ERIE  
April 1978 through April 1979

Huron River Mouth/Huron, Ohio

Dissolved oxygen: <5.0 mg/l ( 0.5 in offshore hypolimnion)

pH: >9.1 su

Conductivity: >500  $\mu$ mhos/cm

Total phosphorus: > 600  $\mu$ g/l

Fecal coliforms: >20000/100 ml

Cadmium: > 15  $\mu$ g/l

Copper: > 150  $\mu$ g/l

Iron: > 2500  $\mu$ g/l

Manganese: > 100  $\mu$ g/l

Selenium: > 15  $\mu$ g/l

Zinc: >200  $\mu$ g/l

Nickel: > 75  $\mu$ g/l

low, while nutrients, ammonia, metals, fecal coliform bacteria, pH and dissolved solids are exceptionally high. These high concentrations may also be the source of the moderately high levels of metals and solids measured to the east at Locust Point and Port Clinton.

The Pointe Mouillee, Michigan area, lying immediately south of the Detroit River mouth, shows elevated metals contamination. Dissolved solids, pH, ammonia and fecal coliform bacteria were also moderately high. The Monroe, Michigan area immediately to the south also showed similar problems, but the degree of degradation was somewhat greater for most parameters near the mouth of the River Raisin.

The Sandusky River mouth and Sandusky Bay area ranks nearly equal with the Monroe, Michigan area as the next most impacted areas after Toledo. In addition to metals contamination, low oxygen and high fecal coliform bacteria were the most severe problems at Sandusky. To the east at Huron metals were a moderate problem, but the most noticeable violations were fecal coliform bacteria and phosphorus.

APPENDIX

VIOLATIONS REPORT FOR WATER QUALITY PARAMETERS  
Western Lake Erie, April 1978-April 1979

VIOLATIONS REPORT FOR DISSOLVED OXYGEN (mg/l) -

LIMITS IN EFFECT:

IJC	<	6.00
O-EPA NORM	<	6.00
O-EPA EX	<	4.00
MICH DNR	<	6.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS				
								IJC	EPANORM	EPAEX	MICHDNR	
78	118	1110	1	2	M-03	S	5.8	X				X
78	179	1925	2	2	M-12	B	5.4	X				X
78	180	840	2	3	M-12	B	4.9	X				X
78	180	900	2	3	M-13	B	4.8	X				X
78	180	928	2	3	M-14	B	5.4	X				X
78	180	945	2	3	M-15	B	5.7	X				X
78	180	1519	2	3	M-19	B	5.6	X				X
78	181	840	2	1	O-02	S	4.0	X	X		X	
78	181	840	2	1	O-02	B	2.1	X	X			
78	181	925	2	1	O-03	S	4.4	X	X		X	
78	181	925	2	1	O-03	B	3.6	X	X			
78	181	1130	2	1	O-06	B	5.9	X	X			
78	181	1200	2	1	O-07	B	4.2	X	X			
78	182	840	2	2	O-02	S	4.5	X	X			
78	182	840	2	2	O-02	B	4.5	X	X			
78	182	840	2	2	O-03	B	5.1	X	X		X	
78	182	915	2	2	O-03	S	3.7	X	X		X	
78	183	906	2	3	O-02	S	3.9	X	X		X	
78	183	906	2	3	O-02	B	3.9	X	X			
78	183	1004	2	3	O-03	S	5.5	X	X			
78	183	1038	2	1	O-17	B	5.9	X	X			
78	188	1038	2	1	O-24	B	5.3	X	X			
78	188	1426	2	1	O-25	B	5.6	X	X			
78	188	1510	2	1	O-36	B	4.7	X	X			
78	188	1654	2	2	O-27	B	5.4	X	X			
78	189	1615	2	2	O-36	B	4.8	X	X			
78	189	1450	2	2	O-36	B	4.6	X	X			
78	191	1705	2	1	O-44	B	3.4	X	X			
78	191	1530	2	1	O-47	B	4.8	X	X			
78	191	1455	2	1	O-50	B	4.8	X	X			
78	191	1455	2	3	O-44	S	5.1	X	X			X
78	193	1320	2	3	O-44	S	5.8	X	X			X
78	235	1120	3	1	M-01	S	5.4	X	X			X
78	235	1335	3	1	M-05	B	5.9	X	X			X
78	235	1310	3	1	M-06	B	5.7	X	X			X
78	236	1545	3	2	M-16	S	5.7	X	X			X
78	236	1545	3	2	M-16	B	5.9	X	X			X
78	237	1255	3	3	M-05	B	5.9	X	X		X	
78	237	1255	3	3	M-05	S	3.6	X	X		X	
78	238	830	3	1	O-02	B	3.7	X	X			
78	238	830	3	1	O-02	S	5.8	X	X			X
78	238	1540	3	1	O-08	S	5.0	X	X			
78	239	1045	3	2	M-22	S	3.4	X	X		X	
78	239	900	3	2	O-02	S	3.4	X	X		X	
78	239	900	3	2	O-02	B	3.4	X	X		X	
78	239	900	3	3	O-02	S	2.3	X	X		X	
78	240	900	3	3	O-02	S	2.4	X	X		X	
78	240	900	3	3	O-02	B	2.4	X	X		X	
78	240	900	3	3	O-02	B	3.0	X	X		X	
78	251	1703	3	3	O-36	B	2.1	X	X		X	
78	252	1020	3	1	O-39	B	2.1	X	X		X	
78	252	1500	3	1	O-44	B	5.4	X	X		X	
78	252	1500	3	1	O-46	B	1.5	X	X		X	
78	252	1417	3	1	O-46	B	0.5	X	X		X	
78	252	1355	3	1	O-47	B	0.5	X	X		X	
78	252	1320	3	1	O-50	B	2.9	X	X		X	

PAGE 1-2  
 VIOLATIONS REPORT FOR DISSOLVED OXYGEN (mg/l) -

LIMITS IN EFFECT:

IJC	<	6.00
O-EPA NORM	<	6.00
O-EPA EX	<	4.00
MICH DNR	<	6.00

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	253	905	3	2	0-44	S	4.5	X			
78	253	905	3	2	0-44	B	4.4	X			
78	253	1210	3	2	0-46	B	2.1	X			
78	253	1101	3	2	0-47	B	0.3	X			
78	253	954	3	2	0-49	B	4.4	X			
78	254	1415	3	3	0-44	S	5.2	X			
78	254	1415	3	3	0-44	B	5.0	X			
78	254	1353	3	3	0-45	B	5.0	X			
78	254	1330	3	3	0-46	B	1.9	X			
78	254	1240	3	3	0-50	B	0.5	X			
79	88	1720	1	1	M-03	S	4.0	X			X

SUMMARY:

59 SAMPLES HAD VIOLATIONS FOR IJC	( 3.60 PERCENT)
45 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 2.75 PERCENT)
10 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 0.61 PERCENT)
14 SAMPLES HAD VIOLATIONS FOR MICH DNR	( 0.85 PERCENT)
59 SAMPLES HAD VIOLATIONS IN ALL	( 3.60 PERCENT)
1637 SAMPLES PROCESSED	



LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	118	1402	1	1	M-23	S	8.62					X
78	118	1436	1	1	M-26	S	8.56					X
78	118	1537	1	1	M-27	S	8.68					X
78	119	1228	1	2	M-22	S	8.62					X
78	113	1117	1	2	O-41	S	9.10	X		X		
78	178	1000	2	1	M-07	S	8.61					X
78	178	1320	2	1	M-09	S	8.57					X
78	178	1211	2	1	M-10	S	8.51					X
78	178	1245	2	1	M-11	S	8.56					X
78	178	2000	2	1	M-12	S	8.55					X
78	178	1925	2	1	M-13	S	8.59					X
78	178	917	2	1	M-15	S	8.61					X
78	178	1347	2	1	M-17	S	8.65					X
78	178	1635	2	1	M-19	S	8.73					X
78	178	1635	2	1	M-19	B	8.70					X
78	178	1525	2	1	M-20	S	8.73					X
78	178	1445	2	1	M-21	S	8.80					X
78	178	1545	2	1	M-22	S	8.58					X
78	178	1815	2	1	M-23	S	8.91					X
78	178	1730	2	1	M-24	S	8.65					X
78	178	1730	2	1	M-24	B	8.67					X
78	178	1808	2	1	M-25	S	8.77					X
78	178	1755	2	1	M-26	S	8.84					X
78	179	1140	2	2	M-03	S	8.54					X
78	179	1235	2	2	M-06	S	8.62					X
78	179	1250	2	2	M-07	S	8.81					X
78	179	1330	2	2	M-08	S	8.77					X
78	179	1408	2	2	M-09	S	8.88					X
78	179	1320	2	2	M-10	S	8.51					X
78	179	1310	2	2	M-11	S	8.71					X
78	179	1925	2	2	M-12	B	8.73					X
78	179	1000	2	2	M-14	S	8.59					X
78	179	1000	2	2	M-14	B	8.51					X
78	179	1040	2	2	M-15	S	8.62					X
78	179	1805	2	2	M-17	S	8.70					X
78	179	1750	2	2	M-18	S	8.75					X
78	179	1718	2	2	M-19	S	8.89					X
78	179	1718	2	2	M-19	B	8.56					X
78	179	1745	2	2	M-20	S	9.00					X
78	179	1745	2	2	M-20	B	8.60					X
78	179	1815	2	2	M-21	S	9.04	X				X
78	179	1815	2	2	M-21	B	8.60					X
78	179	1718	2	2	M-23	S	8.72					X
78	179	1600	2	2	M-24	S	8.93					X
78	179	1600	2	2	M-24	B	8.54					X
78	179	1630	2	2	M-25	S	8.88					X
78	179	1630	2	2	M-25	B	8.58					X
78	179	1707	2	2	M-26	S	8.77					X

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS				
								IJC	EPANORM	EPAEX	MICH DNR	
							8.54					X
78	179	1655	2	2	M-27	S	8.71					X
78	179	1125	2	3	M-02	S	8.57					X
78	180	907	2	3	M-04	S	8.57					X
78	180	1050	2	3	M-05	S	8.51					X
78	180	1158	2	3	M-08	S	8.78					X
78	180	1304	2	3	M-09	S	3.16	X				X
78	180	1304	2	3	M-09	B	8.94					X
78	180	1000	2	3	M-10	S	8.62					X
78	180	840	2	3	M-12	S	8.60					X
78	180	900	2	3	M-13	S	8.53					X
78	180	928	2	3	M-14	S	8.69					X
78	180	945	2	3	M-15	S	8.55					X
78	180	1045	2	3	M-17	S	8.59					X
78	180	1325	2	3	M-18	S	8.98					X
78	180	1519	2	3	M-19	S	8.77					X
78	180	1442	2	3	M-20	S	8.79					X
78	180	1413	2	3	M-21	S	8.61					X
78	180	1413	2	3	M-21	B	8.79					X
78	180	1355	2	3	M-23	S	9.00					X
78	180	1635	2	3	M-24	S	8.75					X
78	180	1635	2	3	M-24	B	9.06	X				X
78	180	1555	2	3	M-25	S	8.59					X
78	180	1555	2	3	M-25	B	8.74					X
78	180	1407	2	3	M-26	S	9.24	X		X		
78	191	1222	2	1	O-29	S	9.17	X		X		
78	191	1300	2	1	O-31	S	9.02	X		X		
78	191	1340	2	1	O-32	S	9.29	X		X		
78	192	1235	2	2	O-29	S	9.19	X		X		
78	192	1250	2	2	O-31	S	9.13	X		X		
78	192	1313	2	2	O-32	S	9.13	X		X		
78	192	1350	2	2	O-34	S	9.05	X		X		
78	192	1415	2	2	O-35	S	9.04	X		X		
78	193	935	2	3	O-29	S	9.04	X		X		
78	193	945	2	3	O-31	S	9.15	X				X
78	235	1240	3	1	M-02	S	8.90					X
78	235	1330	3	1	M-03	S	9.24	X				X
78	235	1410	3	1	M-04	S	9.33	X				X
78	235	1525	3	1	M-07	S	9.33	X				X
78	235	1500	3	1	M-08	S	9.08	X				X
78	235	1230	3	1	M-09	S	9.36	X				X
78	235	1605	3	1	M-10	S	9.24	X				X
78	235	1635	3	1	M-11	S	9.05	X				X
78	235	1010	3	1	M-12	S	9.13	X				X
78	235	1010	3	1	M-12	B	9.28	X				X
78	235	1045	3	1	M-13	S	9.04	X				X
78	235	1045	3	1	M-13	B	9.22	X				X
78	235	1110	3	1	M-14	S	9.00					X
78	235	1110	3	1	M-14	B	9.00					X
78	235	1150	3	1	M-15	S						

PAGE 2-3  
 VIOLATIONS REPORT FOR PH (su) -

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS

IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	235	1150	3	1	M-15	B	8.91					X
78	235	1715	3	1	M-16	S	8.98					X
78	235	1735	3	1	M-17	S	9.10	X				X
78	235	1815	3	1	M-18	S	9.17	X				X
78	235	1610	3	1	M-19	S	9.18	X				X
78	235	1610	3	1	M-19	B	8.98					X
78	235	1635	3	1	M-20	S	9.13	X				X
78	235	1635	3	1	M-20	B	9.04	X				X
78	235	1700	3	1	M-21	S	9.13	X				X
78	235	1700	3	1	M-21	B	9.04	X				X
78	236	1140	3	2	M-02	S	8.87					X
78	236	1235	3	2	M-03	S	8.76					X
78	236	1300	3	2	M-04	S	8.78					X
78	236	1325	3	2	M-05	S	8.72					X
78	236	1325	3	2	M-05	B	8.55					X
78	236	1235	3	2	M-06	S	8.80					X
78	236	1235	3	2	M-06	B	8.56					X
78	236	1235	3	2	M-07	S	9.07	X				X
78	236	1410	3	2	M-07	S	9.19	X				X
78	236	1415	3	2	M-08	S	8.89					X
78	236	1415	3	2	M-08	B	8.92					X
78	236	1218	3	2	M-09	S	8.83					X
78	236	1218	3	2	M-09	B	8.83					X
78	236	1450	3	2	M-10	S	9.35	X				X
78	236	1515	3	2	M-11	S	9.35	X				X
78	236	920	3	2	M-12	S	8.94					X
78	236	920	3	2	M-12	B	8.97					X
78	236	950	3	2	M-13	S	9.08	X				X
78	236	950	3	2	M-13	B	9.12	X				X
78	236	1025	3	2	M-14	S	9.00					X
78	236	1025	3	2	M-14	B	9.00					X
78	236	1050	3	2	M-15	S	9.01	X				X
78	236	1050	3	2	M-15	B	9.07	X				X
78	236	1545	3	2	M-16	S	8.85					X
78	236	1730	3	2	M-17	S	9.22	X				X
78	236	1630	3	2	M-18	S	9.17	X				X
78	236	1540	3	2	M-19	S	9.18	X				X
78	236	1540	3	2	M-19	B	9.08	X				X
78	236	1615	3	2	M-20	S	9.24	X				X
78	236	1615	3	2	M-20	B	8.92					X
78	236	1635	3	2	M-21	S	9.15	X				X
78	236	1635	3	2	M-21	B	8.96					X
78	237	1115	3	3	M-02	S	8.72					X
78	237	1215	3	3	M-04	S	8.85					X
78	237	1245	3	3	M-07	S	8.99					X
78	237	1355	3	3	M-08	S	9.00					X
78	237	1355	3	3	M-08	B	8.70					X
78	237	1205	3	3	M-09	S	8.79					X
78	237	1205	3	3	M-09	B	8.72					X
78	237	1420	3	3	M-10	S	9.23	X				X

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 VIOLATIONS REPORT FOR PH (su) .

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS				
								IJC	EPANORM	EPAEX	MICH	DNR
							9.05	X				X
78	237	1440	3	3	M-11	S	9.05					X
78	237	950	3	3	M-12	S	9.04	X				X
78	237	950	3	3	M-12	B	9.06	X				X
78	237	1013	3	3	M-13	S	9.07	X				X
78	237	1013	3	3	M-13	B	9.04	X				X
78	237	1040	3	3	M-14	S	9.05	X				X
78	237	1040	3	3	M-14	B	9.11	X				X
78	237	1123	3	3	M-15	S	9.03	X				X
78	237	1123	3	3	M-15	B	9.01	X				X
78	237	1500	3	3	M-16	S	8.94					X
78	237	1520	3	3	M-17	S	9.07	X				X
78	237	1530	3	3	M-18	S	9.15	X				X
78	237	1512	3	3	M-19	S	9.18	X				X
78	237	1512	3	3	M-19	B	8.79					X
78	237	1540	3	3	M-20	S	9.25	X				X
78	237	1540	3	3	M-20	B	8.99					X
78	237	1630	3	3	M-21	S	9.21	X				X
78	237	1630	3	3	M-21	B	8.87					X
78	238	1135	3	1	M-22	S	9.17	X				X
78	238	1100	3	1	M-23	S	9.04	X				X
78	238	1130	3	1	M-24	S	9.22	X				X
78	238	1130	3	1	M-24	B	8.81					X
78	238	1213	3	1	M-25	S	9.15	X				X
78	238	1213	3	1	M-25	B	9.03	X				X
78	238	1025	3	1	M-26	S	9.21	X				X
78	238	930	3	1	M-27	S	9.10	X				X
78	238	845	3	1	O-01	S	9.27	X	X		X	
78	238	905	3	1	O-03	S	9.04	X	X		X	
78	238	905	3	1	O-03	B	9.12	X	X		X	
78	238	940	3	1	O-04	S	9.18	X	X		X	
78	238	940	3	1	O-04	B	9.20	X	X		X	
78	238	1010	3	1	O-05	S	9.08	X	X		X	
78	238	1010	3	1	O-05	B	9.20	X	X		X	
78	238	1043	3	1	O-06	S	9.14	X	X		X	
78	238	1043	3	1	O-06	B	9.18	X	X		X	
78	238	1320	3	1	O-07	S	9.12	X	X		X	
78	238	1510	3	1	O-09	S	9.35	X	X		X	
78	238	1445	3	1	O-10	S	9.36	X	X		X	
78	238	1455	3	1	O-11	S	9.06	X	X		X	
78	238	1425	3	1	O-13	S	9.16	X	X		X	
78	239	1045	3	2	M-22	S	9.07	X				X
78	239	1020	3	2	M-23	S	9.35	X				X
78	239	1141	3	2	M-24	S	9.06	X				X
78	239	1141	3	2	M-24	B	8.74					X
78	239	1310	3	2	M-25	S	9.13	X				X
78	239	1310	3	2	M-25	B	8.88					X
78	239	1000	3	2	M-26	S	9.40	X				X
78	239	937	3	2	M-27	S	9.11	X				X
78	239	900	3	2	O-01	S	9.32	X	X		X	

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	239	951	3	2	0-04	S	9.13	X	X	X		
78	239	951	3	2	0-04	B	9.71	X	X	X		
78	239	1023	3	2	0-05	B	9.02	X	X			
78	239	1046	3	2	0-06	S	9.06	X	X			
78	239	1046	3	2	0-06	B	9.09	X	X			
78	239	1046	3	2	0-07	S	9.06	X	X			
78	239	1340	3	2	0-07	B	9.06	X	X			
78	239	1340	3	2	0-09	S	9.31	X	X			
78	239	1420	3	2	0-10	S	9.22	X	X			
78	239	1400	3	2	0-10	S	9.07	X	X			
78	239	1445	3	2	0-13	S	9.07					X
78	240	1025	3	3	M-22	S	8.79	X				X
78	240	1000	3	3	M-23	S	9.28					X
78	240	1130	3	3	M-24	S	8.94					X
78	240	1130	3	3	M-24	B	8.97					X
78	240	1130	3	3	M-24	S	8.98					X
78	240	1250	3	3	M-25	B	8.90					X
78	240	1250	3	3	M-25	S	9.13	X				X
78	240	940	3	3	M-26	S	8.55					X
78	240	907	3	3	M-27	S	9.09	X	X	X		
78	240	845	3	3	0-01	S	9.10	X	X	X		
78	240	953	3	3	0-04	S	9.02	X	X			
78	240	1040	3	3	0-06	B	9.04	X	X			
78	240	1335	3	3	0-07	S	9.03	X	X			
78	240	1335	3	3	0-07	B	9.03	X	X			
78	240	1255	3	3	0-09	S	9.24	X	X			
78	240	1310	3	3	0-10	S	9.24	X	X			
78	240	1310	3	3	0-13	S	9.01	X	X			
78	240	1455	3	3	0-13	S	9.17	X	X			
78	252	1054	3	1	0-29	S	9.07	X	X			
78	252	1015	3	1	0-30	S	9.48	X	X			
78	252	1113	3	1	0-31	S	9.40	X	X			
78	252	1155	3	1	0-32	S	9.09	X	X			
78	252	1220	3	1	0-33	S	9.05	X	X			
78	252	1245	3	1	0-34	S	9.26	X	X			
78	252	1315	3	1	0-35	S	9.39	X	X			
78	253	1130	3	2	0-31	S	9.07	X	X			
78	253	1010	3	2	0-32	S	9.27	X	X			
78	253	1205	3	2	0-33	S	9.31	X	X			
78	253	1217	3	2	0-34	S	9.49	X	X			
78	253	1235	3	2	0-35	S	9.15	X	X			
78	254	1045	3	3	0-29	S	9.06	X	X			
78	254	1028	3	3	0-30	S	9.15	X	X			
78	254	1145	3	3	0-34	S	9.15	X	X			
78	254	1200	3	3	0-35	S	9.35	X	X			
78	254	1300	3	3	0-41	S	9.06	X	X			
78	254	1315	3	3	0-48	S	9.03	X	X			
78	276	1130	4	1	M-04	S	8.72					X
78	276	1230	4	1	M-06	S	8.82					X
78	276	1230	4	1	M-06	B	8.88					X
78	276	1230	4	1	M-07	S	8.76					X
78	276	1210	4	1	M-07	S	8.52					X
78	276	1435	4	1	M-08	S						X

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 VIOLATIONS REPORT FOR PH (su) -

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS					
								IJC	EPANORM	EPAEX	MICH	DNR	
													X
78	276	1150	4	1	M-09	S	8.53						X
78	276	900	4	1	M-12	S	9.49	X					X
78	276	900	4	1	M-12	B	9.50	X					X
78	276	942	4	1	M-13	S	8.61						X
78	276	942	4	1	M-13	B	8.60						X
78	276	1020	4	1	M-14	S	8.55						X
78	276	1020	4	1	M-14	B	8.59						X
78	276	1655	4	1	M-19	S	8.62						X
78	276	1655	4	1	M-19	B	8.69						X
78	276	1655	4	1	M-20	S	8.51						X
78	276	1630	4	1	M-20	B	8.54						X
78	276	1630	4	1	M-20	B	8.64						X
78	277	1035	4	2	M-03	S	8.57						X
78	277	1105	4	2	M-04	S	8.58						X
78	277	1205	4	2	M-05	S	8.57						X
78	277	1205	4	2	M-05	B	8.56						X
78	277	1143	4	2	M-06	S	8.56						X
78	277	1143	4	2	M-06	B	8.63						X
78	277	1130	4	2	M-07	S	8.58						X
78	277	1130	4	2	M-08	S	8.60						X
78	277	1235	4	2	M-08	B	8.57						X
78	277	1235	4	2	M-10	S	8.66						X
78	277	1210	4	2	M-11	S	8.63						X
78	277	1230	4	2	M-11	S	8.55						X
78	277	855	4	2	M-12	S	8.53						X
78	277	955	4	2	M-14	S	8.57						X
78	277	1430	4	2	M-16	S	8.57						X
78	278	1020	4	3	M-03	S	8.64						X
78	278	1020	4	3	M-04	S	8.68						X
78	278	1055	4	3	M-05	B	8.56						X
78	278	1230	4	3	M-06	B	8.51						X
78	278	1155	4	3	M-07	S	8.74						X
78	278	1130	4	3	M-09	S	9.21	X					X
78	278	1130	4	3	M-09	B	9.23	X					X
78	278	1130	4	3	M-09	B	8.79						X
78	278	1200	4	3	M-10	S	8.62						X
78	278	1225	4	3	M-11	S	8.62						X
78	278	1225	4	3	M-12	S	8.57						X
78	278	905	4	3	M-12	B	8.59						X
78	278	905	4	3	M-12	B	8.61						X
78	278	930	4	3	M-13	S	8.61						X
78	278	930	4	3	M-13	B	8.61						X
78	278	930	4	3	M-13	B	8.61						X
78	278	930	4	3	M-13	B	8.61						X
78	279	940	4	3	M-16	S	8.57						X
78	279	940	4	3	M-16	S	8.77						X
78	279	1115	4	3	M-18	S	8.72						X
78	279	1115	4	3	M-18	S	8.72						X
78	280	1040	4	1	M-22	S	8.72						X
78	280	1040	4	1	M-23	S	8.79						X
78	281	1200	4	1	M-23	S	8.56						X
78	279	1230	4	1	M-24	S	8.54						X
78	279	1230	4	1	M-24	B	8.54						X
78	279	1230	4	1	M-24	B	8.62						X
78	279	1155	4	1	M-25	S	8.62						X
78	279	1155	4	1	M-25	B	8.61						X
78	279	1155	4	1	M-25	B	8.61						X
78	279	1155	4	1	M-25	B	8.89						X
78	280	1010	4	1	M-26	S	8.89						X
78	280	1010	4	1	M-26	S	8.70						X
78	280	935	4	1	M-27	S	8.70						X
78	281	1310	4	2	M-22	S	8.69						X

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 VIOLATIONS REPORT FOR PH (su) -

LIMITS IN EFFECT:

IJC	6.50 -	9.00
O-EPA NORM	6.50 -	9.00
O-EPA EX	6.50 -	9.00
MICH DNR	6.70 -	8.50

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
							8.98					X
78	282	1130	4	2	M-23	S	8.60					X
78	280	1200	4	2	M-24	S	8.53					X
78	280	1200	4	2	M-24	B	8.87					X
78	281	1145	4	2	M-26	S	8.62					X
78	281	915	4	2	M-27	S	9.03	X		X		
78	281	1405	4	2	O-07	S	9.01	X		X		
78	281	1405	4	2	O-07	B	8.71					X
78	282	1150	4	3	M-22	S	8.59					X
78	281	1200	4	3	M-24	S	8.56					X
78	281	1200	4	3	M-24	B	8.92					X
78	281	1200	4	3	M-26	S	8.66					X
78	282	1115	4	3	M-27	S	5.46	X		X		
78	282	1050	4	3	M-27	S						
78	284	1037	4	1	O-20	B						

SUMMARY:

135 SAMPLES HAD VIOLATIONS FOR IJC ( 8.25 PERCENT)  
 65 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 3.97 PERCENT)  
 10 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.61 PERCENT)  
 241 SAMPLES HAD VIOLATIONS FOR MICH DNR ( 14.72 PERCENT)  
  
 306 SAMPLES HAD VIOLATIONS IN ALL ( 18.69 PERCENT)  
 1637 SAMPLES PROCESSED

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	117	931	1	1	M-02	S	330	X				
78	114	1340	1	1	M-04	S	325	X				
78	114	1555	1	1	M-10	S	400	X				
78	115	920	1	1	M-16	S	419	X				
78	115	1012	1	1	M-17	S	320	X				
78	118	1131	1	2	M-02	S	380	X				
78	117	1150	1	2	M-07	S	340	X				
78	117	1207	1	2	M-10	S	420	X				
78	117	1250	1	2	M-16	S	340	X				
78	117	1315	1	2	M-17	S	320	X				
78	117	1440	1	2	M-18	S	430	X				
78	118	1510	1	1	O-01	S	400	X		X		
78	117	1420	1	1	O-02	S	435	X		X		
78	117	1420	1	1	O-02	B	440	X		X		
78	117	1330	1	1	O-03	S	410	X		X		
78	117	1330	1	1	O-03	B	410	X		X		
78	117	1830	1	1	O-08	S	370	X		X		
78	117	1741	1	1	O-11	S	400	X		X		
78	117	1741	1	1	O-11	B	400	X		X		
78	117	1645	1	1	O-12	S	320	X				
78	117	1650	1	1	O-13	S	410	X		X		
78	117	1650	1	1	O-13	B	440	X		X		
78	118	1402	1	1	M-23	S	320	X				
78	118	1537	1	1	M-27	S	420	X				
78	119	1126	1	2	O-01	S	360	X		X		
78	118	945	1	2	O-02	S	485	X		X		
78	118	945	1	2	O-02	B	490	X		X		
78	118	1024	1	2	O-03	S	480	X		X		
78	118	1024	1	2	O-03	B	480	X		X		
78	118	1050	1	2	O-04	S	440	X		X		
78	118	1050	1	2	O-04	B	440	X		X		
78	118	1105	1	2	O-05	S	440	X		X		
78	118	1105	1	2	O-05	B	440	X		X		
78	118	1131	1	2	O-06	S	330	X		X		
78	118	1131	1	2	O-06	B	390	X		X		
78	118	1812	1	2	O-08	S	385	X		X		
78	118	1827	1	2	O-09	S	340	X				
78	118	1843	1	2	O-10	S	320	X				
78	118	1515	1	2	O-11	S	410	X		X		
78	118	1515	1	2	O-11	B	410	X		X		
78	118	1900	1	2	O-12	S	340	X				
78	118	1445	1	2	O-13	S	430	X		X		
78	118	1445	1	2	O-13	B	445	X		X		
78	118	1250	1	2	M-24	S	330	X				
78	118	1250	1	2	M-24	B	325	X				
78	118	1335	1	2	M-25	S	320	X				
78	119	1137	1	2	M-27	S	440	X				
78	112	1407	1	1	O-30	S	340	X			X	
78	112	1529	1	1	O-31	S	330	X			X	



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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	112	1606	1	1	0-32	S	320	X			
78	112	1740	1	1	0-33	S	340	X		X	
78	112	1755	1	1	0-34	S	340	X		X	
78	110	1900	1	1	0-44	S	364	X		X	
78	110	1900	1	1	0-44	B	450	X		X	
78	113	1224	1	2	0-32	S	320	X			
78	113	1300	1	2	0-33	S	340	X		X	
78	113	1315	1	2	0-34	S	360	X		X	
78	177	924	2	1	M-01	S	455	X			
78	177	1050	2	1	M-02	S	340	X			
78	178	1211	2	1	M-10	S	330	X			
78	178	1245	2	1	M-11	S	450	X			
78	178	1245	2	1	M-16	S	350	X			
78	178	1347	2	1	M-17	S	340	X			
78	178	1515	2	1	M-18	S	400	X			
78	178	1545	2	1	M-22	S	390	X			
78	178	1815	2	1	M-23	S	425	X			
78	178	1755	2	1	M-26	S	490	X			
78	178	1705	2	1	M-27	S	500	X			
78	178	1735	2	1	O-01	S	475	X		X	
78	179	1320	2	2	M-10	S	420	X			
78	179	1310	2	2	M-11	S	420	X			
78	179	1820	2	2	M-16	S	440	X			
78	179	1805	2	2	M-17	S	400	X			
78	179	1750	2	2	M-18	S	410	X			
78	179	1740	2	2	M-22	S	350	X			
78	179	1718	2	2	M-23	S	350	X			
78	179	1707	2	2	M-26	S	330	X			
78	179	1655	2	2	M-27	S	425	X			
78	179	1640	2	2	O-01	S	540	X		X	
78	180	1000	2	3	M-10	S	360	X			
78	180	950	2	3	M-11	S	620	X			
78	180	1020	2	3	M-16	S	535	X			
78	180	1045	2	3	M-17	S	475	X			
78	180	1325	2	3	M-18	S	355	X			
78	180	1337	2	3	M-22	S	360	X			
78	180	1355	2	3	M-23	S	330	X			
78	180	1407	2	3	M-26	S	340	X			
78	180	1422	2	3	M-27	S	400	X			
78	180	1441	2	3	O-01	S	560	X		X	
78	181	1200	2	1	O-07	B	400	X		X	
78	181	1140	2	1	O-08	S	560	X		X	
78	181	1122	2	1	O-09	S	525	X		X	
78	181	1050	2	1	O-10	S	525	X		X	
78	181	1019	2	1	O-12	S	340	X		X	
78	181	950	2	1	O-14	S	340	X		X	
78	182	1055	2	2	O-05	S	355	X		X	
78	182	1055	2	2	O-05	B	340	X		X	
78	182	1153	2	2	O-06	S	320	X			
78	182	855	2	2	O-08	S	550	X		X	

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	182	918	2	2	0-09	S	530	X		X	
78	182	937	2	2	0-10	S	480	X		X	
78	182	1010	2	2	0-12	S	390	X		X	
78	182	1037	2	2	0-14	S	330	X		X	
78	183	906	2	3	0-02	S	560	X		X	
78	183	906	2	3	0-02	B	570	X		X	
78	183	1004	2	3	0-03	S	540	X		X	
78	183	1004	2	3	0-03	B	410	X		X	
78	183	1110	2	3	0-04	S	350	X		X	
78	183	1110	2	3	0-04	B	350	X		X	
78	183	1142	2	3	0-05	S	355	X		X	
78	183	1142	2	3	0-05	B	360	X		X	
78	188	1254	2	1	0-22	S	310	X			
78	188	1320	2	1	0-23	S	320	X			
78	189	1200	2	2	0-23	S	320	X			
78	189	1211	2	2	0-26	S	310	X			
78	190	1035	2	3	0-21	S	310	X			
78	191	1222	2	1	0-29	S	530	X		X	
78	191	1125	2	1	0-30	S	550	X		X	
78	191	1300	2	1	0-31	S	525	X		X	
78	191	1340	2	1	0-32	S	510	X		X	
78	191	1423	2	1	0-33	S	475	X		X	
78	191	1445	2	1	0-34	S	400	X		X	
78	191	1525	2	1	0-35	S	365	X		X	
78	191	-98	2	1	0-41	S	360	X		X	
78	192	1235	2	2	0-29	S	535	X		X	
78	192	1135	2	2	0-30	S	590	X		X	
78	192	1250	2	2	0-31	S	545	X		X	
78	192	1313	2	2	0-32	S	540	X		X	
78	192	1330	2	2	0-33	S	565	X		X	
78	192	1330	2	2	0-33	S	500	X		X	
78	192	1350	2	2	0-34	S	370	X		X	
78	192	1415	2	2	0-35	S	370	X		X	
78	193	935	2	3	0-29	S	530	X		X	
78	193	915	2	3	0-30	S	505	X		X	
78	193	945	2	3	0-31	S	525	X		X	
78	193	1010	2	3	0-32	S	450	X		X	
78	193	1020	2	3	0-33	S	540	X		X	
78	193	1032	2	3	0-34	S	450	X		X	
78	193	1040	2	3	0-35	S	380	X		X	
78	193	1525	2	3	0-40	S	390	X		X	
78	193	1525	2	3	0-40	B	385	X			
78	193	1405	2	3	0-42	S	310	X			
78	193	1320	2	3	0-44	S	380	X		X	
78	193	1320	2	3	0-44	B	310	X			
78	193	1250	2	3	0-45	B	310	X			
78	236	1545	3	2	M-16	S	313	X			
78	237	1115	3	3	M-02	S	340	X			
78	237	1440	3	3	M-11	S	325	X			
78	237	950	3	3	M-12	B	344	X			
78	237	1500	3	3	M-16	S	320	X			

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	237	1520	3	3	M-17	S	310	X			
78	238	930	3	1	M-27	S	445	X			
78	238	845	3	1	O-01	S	360	X	X		
78	238	830	3	1	O-02	S	450	X	X		
78	238	830	3	1	O-02	B	439	X	X		
78	238	1540	3	1	O-08	S	395	X	X		
78	239	1020	3	2	M-23	S	310	X			
78	239	1000	3	2	M-26	S	310	X			
78	239	937	3	2	M-27	S	430	X			
78	239	900	3	2	O-02	S	435	X	X		
78	239	900	3	2	O-02	B	432	X	X		
78	239	900	3	2	O-02	B	327	X	X		
78	239	926	3	2	O-03	S	319	X			
78	239	926	3	2	O-03	B	400	X	X		
78	239	1435	3	2	O-08	S	400	X	X		
78	240	1000	3	3	M-23	S	320	X			
78	240	940	3	3	M-26	S	345	X			
78	240	907	3	3	M-27	S	485	X			
78	240	900	3	3	O-02	S	477	X	X		
78	240	900	3	3	O-02	B	457	X	X		
78	240	900	3	3	O-02	B	450	X	X		
78	240	1238	3	3	O-08	S	315	X			
78	249	1030	3	1	O-21	S	310	X			
78	250	1145	3	2	O-26	S	535	X	X		
78	252	1054	3	1	O-29	S	540	X	X		
78	252	1015	3	1	O-30	S	540	X	X		
78	252	1113	3	1	O-31	S	430	X	X		
78	252	1155	3	1	O-32	S	365	X	X		
78	252	1220	3	1	O-33	S	330	X	X		
78	252	1245	3	1	O-34	S	335	X	X		
78	252	1315	3	1	O-35	S	322	X	X		
78	252	915	3	1	O-37	S	330	X	X		
78	252	915	3	1	O-37	B	545	X	X		
78	253	1115	3	2	O-29	S	395	X	X		
78	253	1100	3	2	O-30	S	545	X	X		
78	253	1130	3	2	O-31	S	425	X	X		
78	253	1010	3	2	O-32	S	330	X	X		
78	253	1205	3	2	O-33	S	350	X	X		
78	253	1217	3	2	O-34	S	330	X	X		
78	253	1235	3	2	O-35	S	535	X	X		
78	254	1045	3	3	O-29	S	540	X	X		
78	254	1028	3	3	O-30	S	525	X	X		
78	254	1100	3	3	O-31	S	435	X	X		
78	254	940	3	3	O-32	S	365	X	X		
78	254	1134	3	3	O-33	S	350	X	X		
78	254	1145	3	3	O-34	S	360	X	X		
78	254	1200	3	3	O-35	S	328	X	X		
78	254	900	3	3	O-37	S	320	X			
78	254	900	3	3	O-37	B	395	X			
78	276	1450	4	1	M-16	S	340	X			
78	277	1430	4	2	M-16	S	340	X			
78	277	1520	4	2	M-18	S	340	X			

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	280	935	4	1	M-27	S	328	X			
78	280	800	4	1	O-02	S	309	X			
78	280	1535	4	1	O-08	S	310	X			
78	280	1510	4	1	O-09	S	325	X	X		
78	281	915	4	2	M-27	S	318	X			
78	281	910	4	2	O-02	S	340	X		X	
78	281	910	4	2	O-02	B	326	X		X	
78	281	1540	4	2	O-08	S	330	X		X	
78	281	1500	4	2	O-10	S	320	X			
78	281	900	4	3	O-02	S	330	X		X	
78	282	900	4	3	O-02	B	347	X		X	
78	282	900	4	3	O-02	S	400	X		X	
78	282	1230	4	3	O-08	S	342	X		X	
78	288	1350	4	1	O-32	S	338	X		X	
78	289	1030	4	2	O-32	S	442	X		X	
78	290	1040	4	3	O-29	S	358	X		X	
78	290	1100	4	3	O-30	S	358	X		X	
78	290	1115	4	3	O-31	S	419	X		X	
78	290	1015	4	3	O-32	S	359	X		X	
78	290	1015	4	3	O-32	S	477	X			
79	89	1415	1	1	M-10	S	393	X			
79	89	1450	1	1	M-11	S	380	X			
79	88	1950	1	1	M-12	S	341	X			
79	88	1950	1	1	M-12	B	507	X			
79	89	1535	1	1	M-16	S	377	X			
79	89	1725	1	1	M-17	S	357	X			
79	89	1750	1	1	M-18	S	467	X			
79	91	1120	1	1	M-23	S	597	X			
79	91	1055	1	1	M-26	S	747	X			
79	91	1020	1	1	M-27	S	637	X		X	
79	91	950	1	1	O-01	S	377	X		X	
79	91	935	1	1	O-02	S	378	X		X	
79	91	935	1	1	O-02	B	367	X		X	
79	91	1010	1	1	O-03	S	372	X		X	
79	91	1010	1	1	O-03	B	394	X		X	
79	91	1045	1	1	O-04	S	385	X		X	
79	91	1045	1	1	O-04	B	405	X		X	
79	91	1105	1	1	O-05	S	390	X		X	
79	91	1105	1	1	O-05	B	339	X		X	
79	91	1145	1	1	O-06	B	587	X		X	
79	91	1615	1	1	O-08	S	532	X		X	
79	91	1710	1	1	O-09	S	427	X		X	
79	91	1740	1	1	O-10	S	527	X		X	
79	97	1130	1	1	O-14	S	477	X		X	
79	97	1215	1	1	O-15	S	487	X		X	
79	97	1240	1	1	O-16	S	467	X		X	
79	97	1230	1	1	O-17	S	497	X		X	
79	97	1230	1	1	O-17	B	417	X		X	
79	97	1205	1	1	O-18	S	417	X		X	
79	97	1205	1	1	O-18	B	407	X		X	
79	97	1145	1	1	O-19	S	412	X		X	
79	97	1145	1	1	O-19	B		X		X	

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:  
 IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
			1	1	0-20	B	327	X			X
79	97	1115	1	1	0-21	S	467	X			X
79	97	1315	1	1	0-22	S	347	X			X
79	97	1415	1	1	0-23	S	357	X			X
79	97	1440	1	1	0-25	S	372	X			X
79	97	1410	1	1	0-25	B	382	X			X
79	97	1410	1	1	0-26	S	332	X			X
79	97	1500	1	1	0-29	S	467	X			X
79	103	1030	1	1	0-30	S	487	X			X
79	103	1005	1	1	0-31	S	457	X			X
79	103	1055	1	1	0-32	S	477	X			X
79	103	1215	1	1	0-33	S	387	X			X
79	103	1305	1	1	0-34	S	387	X			X
79	103	1350	1	1	0-44	S	527	X			X
79	103	1630	1	1	0-44	B	457	X			X
79	103	1630	1	1	0-45	B	342	X			X
79	103	1540	1	1	0-45	B	480	X			X
79	90	1305	1	2	M-10	S	320	X			X
79	90	1330	1	2	M-11	S	328	X			X
79	89	920	1	2	M-12	S	324	X			X
79	89	920	1	2	M-12	B	380	X			X
79	90	1405	1	2	M-16	S	350	X			X
79	90	1450	1	2	M-17	S	420	X			X
79	90	1510	1	2	M-18	S	330	X			X
79	90	1525	1	2	M-22	S	537	X			X
79	92	1140	1	2	M-23	S	317	X			X
79	92	1350	1	2	M-24	S	337	X			X
79	92	1350	1	2	M-24	B	361	X			X
79	92	1230	1	2	M-25	B	597	X			X
79	92	1120	1	2	M-26	S	747	X			X
79	92	1050	1	2	M-27	S	527	X			X
79	92	1025	1	2	0-01	S	338	X			X
79	92	1000	1	2	0-02	S	348	X			X
79	92	1000	1	2	0-02	B	333	X			X
79	92	1040	1	2	0-03	S	338	X			X
79	92	1040	1	2	0-03	B	353	X			X
79	92	1110	1	2	0-04	S	352	X			X
79	92	1110	1	2	0-04	B	393	X			X
79	92	1130	1	2	0-05	S	393	X			X
79	92	1130	1	2	0-05	B	350	X			X
79	92	1205	1	2	0-06	S	375	X			X
79	92	1205	1	2	0-06	B	537	X			X
79	92	1245	1	2	0-08	S	437	X			X
79	92	1330	1	2	0-09	S	407	X			X
79	92	1335	1	2	0-10	S	327	X			X
79	98	1100	1	2	0-12	S	517	X			X
79	98	1310	1	2	0-14	S	477	X			X
79	98	1420	1	2	0-15	S	427	X			X
79	98	1445	1	2	0-16	S	427	X			X
79	98	1150	1	2	0-17	S	397	X			X
79	98	1150	1	2	0-17	B					X

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) .

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS					
								IJC	EPANORM	EPAEX	MICH	DNR	
			1	2	0-18	B	312	X					
79	98	1135	1	2	0-20	S	347	X		X			
79	98	1055	1	2	0-20	B	322	X		X			
79	98	1055	1	2	0-21	S	397	X		X			
79	98	1515	1	2	0-25	S	347	X		X			
79	98	1345	1	2	0-25	B	377	X		X			
79	98	1345	1	2	0-32	S	477	X		X			
79	104	1250	1	2	0-33	S	447	X		X			
79	104	1310	1	2	0-34	S	347	X		X			
79	104	1405	1	2	0-34	S	320	X		X			
79	90	1025	1	3	M-01	S	370	X		X			
79	90	1100	1	3	M-02	S	310	X		X			
79	90	1210	1	3	M-04	S	457	X		X			
79	90	1210	1	3	M-10	S	377	X		X			
79	91	1445	1	3	M-11	S	339	X		X			
79	91	1505	1	3	M-12	B	467	X		X			
79	90	934	1	3	M-16	S	467	X		X			
79	91	1350	1	3	M-18	S	347	X		X			
79	91	1210	1	3	M-22	S	317	X		X			
79	91	1155	1	3	M-23	S	627	X		X			
79	93	1110	1	3	M-24	S	527	X		X			
79	93	1245	1	3	M-24	B	527	X		X			
79	93	1245	1	3	M-26	S	547	X		X			
79	93	1050	1	3	M-27	S	647	X		X			
79	93	1005	1	3	0-01	S	627	X		X			
79	93	935	1	3	0-02	S	527	X		X			
79	93	930	1	3	0-02	B	537	X		X			
79	93	930	1	3	0-03	S	527	X		X			
79	93	955	1	3	0-03	B	597	X		X			
79	93	955	1	3	0-04	S	487	X		X			
79	93	1025	1	3	0-04	B	527	X		X			
79	93	1025	1	3	0-05	S	357	X		X			
79	93	1050	1	3	0-05	B	547	X		X			
79	93	1050	1	3	0-06	B	587	X		X			
79	93	1135	1	3	0-07	B	527	X		X			
79	93	1415	1	3	0-08	S	527	X		X			
79	93	1305	1	3	0-09	S	487	X		X			
79	93	1345	1	3	0-10	S	477	X		X			
79	93	1410	1	3	0-11	S	367	X		X			
79	93	1450	1	3	0-11	B	567	X		X			
79	93	1450	1	3	0-13	S	497	X		X			
79	93	1535	1	3	0-13	B	557	X		X			
79	93	1535	1	3	0-16	S	357	X		X			
79	102	1205	1	3	0-21	S	472	X		X			
79	102	1240	1	3	0-22	S	362	X		X			
79	102	1335	1	3	0-23	S	357	X		X			
79	102	1355	1	3	0-24	S	347	X		X			
79	102	1235	1	3	0-24	B	347	X		X			
79	102	1235	1	3	0-30	S	477	X		X			
79	105	1055	1	3	0-31	S	427	X		X			
79	105	1140	1	3	0-33	S	457	X		X			
79	105	1230	1	3	0-33	S							

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 VIOLATIONS REPORT FOR CONDUCTIVITY (umho/cm) -

LIMITS IN EFFECT:

IJC > 308.00  
 O-EPA NORM > 320.00  
 O-EPA EX > 2400.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
							537	X		X	
79	105	1250	1	3	0-34	S	392	X		X	
79	105	1315	1	3	0-35	S	317	X			
79	105	950	1	3	0-37	S	342	X		X	
79	105	1015	1	3	0-38	S	322	X		X	
79	105	1015	1	3	0-38	B					

SUMMARY:

354 SAMPLES HAD VIOLATIONS FOR IJC ( 21.62 PERCENT)  
 230 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 14.05 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.00 PERCENT)  
 354 SAMPLES HAD VIOLATIONS IN ALL ( 21.62 PERCENT)  
 1637 SAMPLES PROCESSED

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 VIOLATIONS REPORT FOR TOTAL PHOSPHORUS (ug/l) -

LIMITS IN EFFECT:

IJC > 500.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	117	1830	1	1	0-08	S	618.4	X			
78	117	1645	1	1	0-12	S	874.0	X			
78	118	945	1	2	0-02	S	616.4	X			
78	118	945	1	2	0-02	B	1030.4	X	X		X
78	118	1024	1	2	0-03	B	661.2	X			
78	118	1131	1	2	0-06	B	617.6	X			
78	118	1812	1	2	0-08	S	540.8	X			
78	118	1812	1	2	0-11	B	524.0	X			
78	118	1515	1	2	0-42	B	644.4	X			
78	111	1230	1	2	0-42	B	774.8	X			
78	178	1705	2	1	M-27	S	535.2	X			
78	178	1735	2	1	0-01	S	658.4	X			
78	180	1422	2	3	M-27	S	581.6	X			
78	181	840	2	1	0-02	S	574.0	X			
78	181	1140	2	1	0-08	S	628.1	X			
78	183	1004	2	3	0-03	B	626.0	X			
78	183	1110	2	3	0-04	S	502.0	X			
78	239	937	3	2	M-27	S	502.3	X			
78	281	1500	4	2	0-10	S					

SUMMARY:

18 SAMPLES HAD VIOLATIONS FOR IJC ( 1.10 PERCENT)  
 1 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.06 PERCENT)  
 1 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.06 PERCENT)  
 18 SAMPLES HAD VIOLATIONS IN ALL ( 1.10 PERCENT)  
 1637 SAMPLES PROCESSED



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VIOLATIONS REPORT FOR CHLORIDE (mg/l) -

LIMITS IN EFFECT:  
O-EPA NORM > 250.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR

SUMMARY:

0 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.00 PERCENT)  
0 SAMPLES HAD VIOLATIONS IN ALL ( 0.00 PERCENT)  
1637 SAMPLES PROCESSED

PAGE 7-1  
 VIOLATIONS REPORT FOR FLOURIDE (mg/l) -

LIMITS IN EFFECT:  
 IJC > 1.20  
 O-EPA NORM > 1.80  
 O-EPA EX > 2.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR DAY TIME CRUISE RUN STA DEPTH  
 CODE VALUE

SUMMARY:

0 SAMPLES HAD VIOLATIONS FOR IJC	( 0.00 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 0.00 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 0.00 PERCENT)
0 SAMPLES HAD VIOLATIONS IN ALL	( 0.00 PERCENT)
1637 SAMPLES PROCESSED	

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 VIOLATIONS REPORT FOR SULFATE (ug/l) .

LIMITS IN EFFECT:

O-EPA NORM > 250.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	191	1125	2	1	0-30	S	283.2				X
78	252	1054	3	1	0-29	S	334.8				X
78	252	1015	3	1	0-30	S	348.4				X
78	252	1113	3	1	0-31	S	334.0				X
78	253	1115	3	2	0-29	S	342.0				X

SUMMARY:

5 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.31 PERCENT)

5 SAMPLES HAD VIOLATIONS IN ALL ( 0.31 PERCENT)  
 1637 SAMPLES PROCESSED

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 VIOLATIONS REPORT FOR PHENOL (ug/l) -

LIMITS IN EFFECT:

IJC > 1.00  
 O-EPA NORM > 1.00  
 O-EPA EX > 10.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR DAY TIME CRUISE RUN STA DEPTH  
 CODE VALUE

SUMMARY:

0 SAMPLES HAD VIOLATIONS FOR IJC ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS IN ALL ( 0.00 PERCENT)  
 309 SAMPLES PROCESSED

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 VIOLATIONS REPORT FOR FECAL COLIFORMS (col/100ml) -

LIMITS IN EFFECT:  
 IJC > 200.00  
 O-EPA NORM > 200.00  
 MICH DNR > 200.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	178	1705	2	1	M-27	S	230	X				X
78	179	1925	2	2	M-12	S	250	X				X
78	179	1718	2	2	M-19	S	630	X				X
78	179	1600	2	2	M-24	S	3300	X				X
78	181	840	2	1	O-02	S	10000	X	X			
78	181	840	2	1	O-02	B	1200	X	X			
78	181	925	2	1	O-03	S	370	X	X			
78	188	1019	2	1	O-15	S	220	X	X			
78	188	1254	2	1	O-22	S	3200	X	X			
78	188	1320	2	1	O-23	S	220	X	X			X
78	188	1320	3	1	M-01	S	720	X				
78	235	1120	3	2	O-02	S	440	X	X			
78	239	900	3	2	O-02	B	800	X	X			
78	239	900	3	2	O-26	S	660	X	X			
78	250	1145	3	2	O-42	S	230	X	X			
78	253	1315	3	2	O-44	S	23000	X	X			
78	253	905	3	2	O-44	B	9800	X	X			
78	253	905	3	2	O-45	B	980	X	X			X
78	253	925	3	2	O-45	S	330	X				X
78	277	925	4	2	M-01	S	250	X				X
78	277	1010	4	2	M-02	S	460	X				X
78	277	1035	4	2	M-03	S	980	X				X
78	277	1520	4	2	M-18	S	980	X				
78	286	930	4	3	O-23	S	210	X	X			
78	286	945	4	3	O-26	S	5100	X	X			
78	286	945	4	2	O-33	S	240	X	X			
78	289	910	4	3	O-44	B	480	X	X			X
78	290	910	4	3	O-44	S	420	X				
79	89	1415	1	1	M-10	S	420	X		X		
79	89	1415	1	2	O-34	S	3300	X	X			
79	104	1405	1	2	O-44	S	2000	X	X			
79	104	930	1	2	O-44	B	360	X	X			
79	104	930	1	2	O-44	B	210	X	X			
79	104	1135	1	2	O-45	B	210	X	X			
79	104	1405	1	2	O-48	S	1300	X	X			X
79	105	1405	1	2	O-48	S	240	X				
79	93	1005	1	3	M-27	S	350	X	X			
79	93	935	1	3	O-01	S	670	X	X			
79	93	930	1	3	O-02	S	850	X	X			
79	93	930	1	3	O-02	B	850	X	X			
79	93	930	1	3	O-02	S	550	X	X			
79	93	955	1	3	O-03	S	670	X	X			
79	93	955	1	3	O-03	B	670	X	X			
79	93	955	1	3	O-04	B	300	X	X			
79	93	1025	1	3	O-09	S	500	X	X			
79	93	1345	1	3	O-09	S	500	X	X			
79	105	1120	1	3	O-29	S	3800	X	X			
79	105	1120	1	3	O-30	S	410	X	X			
79	105	1055	1	3	O-30	S	1200	X	X			
79	105	1140	1	3	O-31	S	2100	X	X			
79	105	1223	1	3	O-44	S	2100	X	X			
79	105	1223	1	3	O-44	B	1500	X	X			

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VIOLATIONS REPORT FOR FECAL COLIFORMS (col/100ml) -

SUMMARY:

45 SAMPLES HAD VIOLATIONS FOR IJC	( 2.75 PERCENT)
34 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 2.08 PERCENT)
11 SAMPLES HAD VIOLATIONS FOR MICH DNR	( 0.67 PERCENT)
45 SAMPLES HAD VIOLATIONS IN ALL	( 2.75 PERCENT)
1637 SAMPLES PROCESSED	

LIMITS IN EFFECT:  
 IJC > 50.00  
 O-EPA NORM > 50.00  
 O-EPA EX > 100.00  
 MICH DNR > 100.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR DAY TIME CRUISE RUN STA DEPTH  
 CODE VALUE

SUMMARY:

0 SAMPLES HAD VIOLATIONS FOR IJC ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR MICH DNR ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS IN ALL ( 0.00 PERCENT)  
 370 SAMPLES PROCESSED

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 VIOLATIONS REPORT FOR TOTAL CADMIUM (ug/l) -

LIMITS IN EFFECT:

IJC	>	0.20
O-EPA NORM	>	1.20
O-EPA EX	>	12.00
MICH DNR	>	12.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	118	1510	1	1	0-01	S	0.25	X				
78	117	1420	1	1	0-02	S	0.33	X				
78	117	1330	1	1	0-03	S	0.27	X				
78	117	1055	1	1	0-05	S	0.36	X				
78	117	1010	1	1	0-06	S	0.63	X				
78	117	1010	1	1	0-06	S	0.36	X				
78	117	1010	1	1	0-06	S	1.09	X				
78	117	1010	1	1	0-06	S	1.79	X		X		
78	117	1010	1	1	0-06	S	0.75	X				
78	117	1724	1	1	0-10	S	2.39	X		X		
78	117	1724	1	2	0-11	S	1.39	X		X		
78	118	1515	1	1	0-12	S	0.25	X				
78	117	1645	1	1	0-13	S	0.73	X				
78	117	1650	1	1	0-14	S	0.30	X				
78	106	1145	1	1	0-16	S	0.42	X				
78	105	1620	1	1	0-16	S	0.29	X				
78	105	1620	1	1	0-18	S	0.53	X				
78	106	1300	1	1	0-23	S	0.23	X				
78	104	1245	1	1	0-25	S	0.44	X				
78	104	1250	1	1	0-26	S	0.89	X				
78	106	1530	1	1	0-26	S	0.93	X				
78	106	1530	1	1	0-34	S	5.69	X		X		
78	112	1755	1	1	0-37	S	0.58	X				
78	109	1645	1	1	0-46	S	1.29	X		X		
78	110	1654	1	1	0-46	S	2.59	X				
78	114	1140	1	1	M-06	S	0.50	X				
78	115	1425	1	1	M-15	S	0.56	X				
78	115	1700	1	1	M-21	S	1.79	X				
78	115	1700	1	1	M-21	S	1.00	X				
78	118	1402	1	1	M-23	S	0.25	X				
78	178	1735	2	1	0-01	S	0.56	X				
78	181	840	2	1	0-02	S	0.70	X				
78	181	925	2	1	0-03	S	0.26	X				
78	181	1050	2	1	0-10	S	0.42	X				
78	182	1037	2	2	0-14	S	0.23	X				
78	188	1426	2	1	0-24	S	0.43	X				
78	191	1222	2	1	0-29	S	0.22	X				
78	191	1125	2	1	0-30	S	0.31	X				
78	191	1300	2	1	0-31	S	0.32	X				
78	191	1445	2	1	0-34	S	0.38	X				
78	191	1525	2	1	0-35	S	0.42	X				
78	188	1654	2	1	0-36	S	0.21	X				
78	191	1000	2	1	0-37	S	0.47	X				
78	191	1120	2	1	0-39	S	0.39	X				
78	191	-98	2	1	0-41	S	0.52	X				
78	191	1330	2	1	0-43	S	0.64	X				
78	191	1705	2	1	0-44	S	0.45	X				
78	191	1635	2	1	0-45	S	0.54	X				
78	191	-98	2	1	0-46	S						



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 VIOLATIONS REPORT FOR TOTAL CADMIUM (ug/l) -

LIMITS IN EFFECT:

IJC	>	0.20
O-EPA NORM	>	1.20
O-EPA EX	>	12.00
MICH DNR	>	12.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	191	1530	2	1	O-47	S	0.67	X			
78	192	915	2	1	O-48	S	0.46	X			
78	191	1415	2	1	O-49	S	0.55	X			
78	191	1455	2	1	O-50	S	0.32	X			
78	177	924	2	1	M-01	S	0.75	X			
78	177	924	2	2	M-01	S	0.76	X			
78	178	800	2	1	M-02	S	0.30	X			
78	177	1050	2	1	M-02	S	1.59	X			
78	177	1050	2	2	M-02	S	0.60	X			
78	178	826	2	2	M-02	S	0.93	X			
78	178	845	2	1	M-03	S	2.39	X			
78	178	1030	2	1	M-05	S	0.45	X			
78	178	1135	2	1	M-06	S	0.80	X			
78	178	1000	2	1	M-07	S	0.80	X			
78	178	1000	2	1	M-07	S	10.00	X			
78	178	1000	2	1	M-09	S	0.50	X			
78	178	1320	2	1	M-10	S	0.35	X			
78	178	1211	2	1	M-11	S	0.61	X			
78	178	1245	2	1	M-18	S	1.89	X			
78	178	1515	2	1	M-19	S	0.50	X			
78	178	1635	2	1	M-20	S	1.29	X			
78	178	1525	2	1	M-20	S	1.19	X			
78	178	1755	2	1	M-26	S	0.26	X			
78	238	845	3	1	O-01	S	0.26	X			
78	238	845	3	1	O-03	S	0.38	X			
78	238	905	3	1	O-06	S	0.30	X			
78	238	1043	3	1	O-08	S	2.79	X		X	
78	238	1540	3	1	O-09	S	0.25	X			
78	238	1510	3	1	O-10	S	0.35	X			
78	239	1400	3	2	O-10	S	0.35	X			
78	238	1455	3	1	O-11	S	0.50	X			
78	238	1455	3	1	O-12	S	0.27	X			
78	238	1410	3	1	O-12	S	1.69	X		X	
78	239	1337	3	2	O-12	S	0.21	X			
78	239	1337	3	1	O-16	S	0.21	X			
78	249	1000	3	1	O-21	S	0.25	X			
78	249	1030	3	1	O-21	S	0.47	X			
78	249	1130	3	1	O-23	S	0.37	X			
78	249	1150	3	1	O-26	S	0.37	X			
78	249	1150	3	1	O-34	S	1.29	X		X	
78	252	1245	3	1	M-05	S	1.19	X			
78	235	1335	3	1	M-06	S	0.55	X			
78	235	1310	3	1	M-06	S	1.79	X			
78	237	1245	3	3	M-07	S	0.70	X			
78	235	1500	3	1	M-08	S	0.69	X			
78	235	1010	3	1	M-12	S	0.93	X			
78	235	1045	3	1	M-13	S	5.89	X			
78	235	1110	3	1	M-14	S	4.50	X			
78	235	1110	3	1	M-14	S	1.79	X			
78	235	1150	3	1	M-15	S	1.19	X			
78	237	1520	3	3	M-17	S	1.50	X			
78	237	1530	3	3	M-18	S	0.57	X			
78	237	1530	3	3	M-18	S	1.50	X			
78	235	1610	3	1	M-19	S	1.50	X			
78	235	1635	3	1	M-20	S	1.50	X			

PAGE 14- 3  
 VIOLATIONS REPORT FOR TOTAL CADMIUM (ug/l).

LIMITS IN EFFECT:

IJC	>	0.20
O-EPA NORM	>	1.20
O-EPA EX	>	12.00
MICH DNR	>	12.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH	VALUE	OBJECTIVES & STANDARDS				
						CODE		IJC	EPANORM	EPAEX	MICH	DNR
78	235	1700	3	1	M-21	S	0.71	X				
78	238	1135	3	1	M-22	S	0.88	X				
78	238	1100	3	1	M-23	S	1.29	X				
78	238	1130	3	1	M-24	S	1.09	X				
78	238	1213	3	1	M-25	S	1.19	X				
78	238	1025	3	1	M-26	S	2.29	X				
78	238	930	3	1	M-27	S	2.09	X	X		X	
78	280	925	4	1	O-03	S	18.00	X	X			
78	280	1535	4	1	O-08	S	12.00	X				
78	280	1405	4	1	O-12	S	0.48	X				
78	280	1110	4	1	O-15	S	0.26	X				
78	284	1200	4	1	O-17	S	0.75	X		X		
78	284	1140	4	1	O-18	S	1.79	X				
78	284	1105	4	1	O-19	S	0.85	X		X		
78	284	1037	4	1	O-20	S	3.00	X		X		
78	284	1037	4	1	O-20	S	120.00	X		X		
78	284	1155	4	1	O-21	S	8.89	X				
78	284	1310	4	1	O-22	S	0.97	X				
78	284	1330	4	1	O-23	S	1.09	X		X		
78	284	1327	4	1	O-24	S	17.00	X		X		
78	284	1400	4	1	O-26	S	6.00	X				
78	284	1523	4	1	O-28	S	0.63	X		X		
78	288	1230	4	1	O-29	S	1.29	X		X		
78	288	1310	4	1	O-30	S	1.39	X		X		
78	288	1330	4	1	O-31	S	11.00	X		X		
78	288	1330	4	1	O-32	S	16.00	X		X		
78	288	1350	4	1	O-32	S	13.00	X		X		
78	288	1130	4	1	O-33	S	1.19	X				
78	288	1058	4	1	O-34	S	0.52	X				
78	288	1058	4	1	O-34	S	0.83	X				
78	288	1035	4	1	O-35	S	15.00	X		X		
78	284	1703	4	1	O-36	S	120.00	X		X		
78	288	1520	4	1	O-37	S	2.50	X		X		
78	288	1450	4	1	O-38	S	15.00	X		X		
78	288	1405	4	1	O-39	S	5.89	X		X		
78	288	1405	4	1	O-39	S	1.00	X				
78	288	1310	4	1	O-40	S	5.59	X		X		
78	288	950	4	1	O-41	S	13.00	X		X		
78	288	1230	4	1	O-42	S	6.50	X		X		
78	288	1201	4	1	O-43	S	18.00	X		X		
78	288	1201	4	1	O-43	S	0.41	X				
78	288	922	4	1	O-44	S	4.19	X		X		
78	288	1137	4	1	O-45	S	3.39	X		X		
78	288	1120	4	1	O-46	S	1.59	X		X		
78	288	1047	4	1	O-47	S	0.55	X				
78	288	930	4	1	O-48	S	0.91	X				
78	288	1015	4	1	O-50	S	1.59	X				
78	276	935	4	1	M-01	S	18.00	X				X
78	276	1030	4	1	M-02	S	0.25	X				
78	276	1030	4	1	M-02	S		X				

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 VIOLATIONS REPORT FOR TOTAL CADMIUM (ug/l) -

LIMITS IN EFFECT:  
 IJC > 0.20  
 O-EPA NORM > 1.20  
 O-EPA EX > 12.00  
 MICH DNR > 12.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICH DNR
78	276	1100	4	1	M-03	S	1.89	X			
78	276	1130	4	1	M-04	S	0.56	X			
78	276	1350	4	1	M-05	S	7.39	X			
78	276	1230	4	1	M-06	S	8.59	X			
78	276	1210	4	1	M-07	S	1.29	X			
78	276	1210	4	1	M-07	S	3.00	X			
78	276	1210	4	1	M-07	S	0.69	X			
78	276	1210	4	1	M-07	S	5.59	X			X
78	276	1435	4	1	M-08	S	39.00	X			
78	276	1150	4	1	M-09	S	6.89	X			
78	276	1350	4	1	M-10	S	1.39	X			
78	276	1420	4	1	M-11	S	9.29	X			
78	276	900	4	1	M-12	S	0.29	X			
78	276	942	4	1	M-13	S	2.59	X			
78	276	1020	4	1	M-14	S	0.83	X			
78	276	1020	4	1	M-14	S	4.59	X			
78	276	1020	4	1	M-14	S	0.66	X			
78	276	1105	4	1	M-15	S	0.53	X			
78	276	1450	4	1	M-16	S	1.00	X			X
78	276	1515	4	1	M-17	S	13.00	X			
78	276	1625	4	1	M-18	S	6.50	X			
78	276	1655	4	1	M-19	S	2.79	X			
78	276	1655	4	1	M-19	S	6.89	X			
78	276	1630	4	1	M-20	S	0.80	X			
78	280	1040	4	1	M-22	S	1.89	X			
78	281	1200	4	1	M-23	S	8.50	X			
78	280	1200	4	2	M-24	S	6.79	X			
78	279	1155	4	1	M-25	S	7.09	X			
78	279	1155	4	1	M-25	S	8.09	X			
78	280	1010	4	1	M-26	S	6.79	X			
78	280	935	4	1	M-27	S	8.79	X			
78	280	935	4	1	M-27	S					

SUMMARY:  
 177 SAMPLES HAD VIOLATIONS FOR IJC ( 47.84 PERCENT)  
 33 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 8.92 PERCENT)  
 1 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.27 PERCENT)  
 3 SAMPLES HAD VIOLATIONS FOR MICH DNR ( 0.81 PERCENT)  
 177 SAMPLES HAD VIOLATIONS IN ALL ( 47.84 PERCENT)  
 370 SAMPLES PROCESSED

PAGE 15- 1  
 VIOLATIONS REPORT FOR TOTAL CHROMIUM (ug/l) -

LIMITS IN EFFECT:  
 IJC > 50.00  
 O-EPA NORM > 50.00  
 O-EPA EX > 100.00  
 MICH DNR > 100.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	118	1515	1	2	O-11	S	100.00	X		X		
78	105	1620	1	1	O-16	S	98.00	X		X		
78	106	1530	1	1	O-26	S	110.00	X		X		
78	115	1700	1	1	M-21	S	68.00	X				
78	118	1402	1	1	M-23	S	84.00	X				
78	177	1050	2	1	M-02	S	66.00	X				
78	178	915	2	1	M-04	S	52.00	X				
78	178	1235	2	1	M-08	S	56.00	X				
78	178	1315	2	1	M-16	S	57.00	X		X		
78	240	900	3	3	O-02	S	72.00	X		X	X	
78	238	905	3	1	O-03	S	81.00	X		X	X	
78	238	1010	3	1	O-05	S	76.00	X		X	X	
78	238	1043	3	1	O-06	S	67.00	X		X	X	
78	238	1320	3	1	O-07	S	62.00	X		X	X	
78	238	1510	3	1	O-09	S	90.00	X		X	X	
78	239	1400	3	2	O-10	S	66.00	X		X	X	
78	238	1410	3	1	O-12	S	110.00	X		X	X	
78	239	1337	3	2	O-12	S	120.00	X		X	X	
78	238	1340	3	1	O-14	S	81.00	X		X	X	
78	249	930	3	1	O-15	S	87.00	X		X	X	
78	249	1000	3	1	O-16	S	71.00	X		X	X	
78	249	1125	3	1	O-17	S	73.00	X		X	X	
78	249	1150	3	1	O-18	S	65.00	X		X	X	
78	249	1204	3	1	O-19	S	64.00	X		X	X	
78	249	1222	3	1	O-20	S	79.00	X		X	X	
78	249	1105	3	1	O-22	S	69.00	X		X	X	
78	249	1130	3	1	O-23	S	83.00	X		X	X	
78	249	1325	3	1	O-24	S	58.00	X		X	X	
78	252	1245	3	1	O-34	S	83.00	X		X	X	
78	252	1315	3	1	O-35	S	70.00	X		X	X	
78	284	1155	4	1	O-21	S	83.00	X		X	X	
78	284	1330	4	1	O-23	S	57.00	X		X	X	
78	284	1400	4	1	O-26	S	70.00	X		X	X	
78	284	1400	4	1	O-26	S	87.00	X		X	X	
78	288	1310	4	1	O-30	S	51.00	X		X	X	
78	288	1330	4	1	O-31	S	79.00	X		X	X	
78	288	1350	4	1	O-32	S	56.00	X		X	X	
78	288	1130	4	1	O-33	S	52.00	X		X	X	
78	284	1703	4	1	O-36	S	52.00	X		X	X	
78	276	1030	4	1	M-02	S	61.00	X		X	X	
78	276	900	4	1	M-12	S	58.00	X		X	X	
78	276	1515	4	1	M-17	S	52.00	X		X	X	
78	276	1600	4	1	M-21	S	76.00	X		X	X	

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VIOLATIONS REPORT FOR TOTAL CHROMIUM (ug/l) -

SUMMARY:

43 SAMPLES HAD VIOLATIONS FOR IJC	( 11.62 PERCENT)
33 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 8.92 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 0.00 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR MICH DNR	( 0.00 PERCENT)
43 SAMPLES HAD VIOLATIONS IN ALL	( 11.62 PERCENT)
370 SAMPLES PROCESSED	

PAGE 16- 1  
 VIOLATIONS REPORT FOR TOTAL COPPER (ug/l) .

LIMITS IN EFFECT:

IJC > 5.00  
 O-EPA NORM > 5.00  
 O-EPA EX > 10.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
							25	X	X		X
						S	8	X	X		
78	118	1510	1	1	0-01	S	8	X	X		
78	117	1330	1	1	0-03	S	8	X	X		
78	117	1200	1	1	0-04	S	8	X	X		
78	117	1055	1	1	0-05	S	11	X	X		
78	117	1010	1	1	0-06	S	11	X	X		
78	117	1010	1	1	0-06	S	19	X	X		
78	117	1010	1	1	0-06	S	18	X	X		
78	117	1010	1	1	0-06	S	44	X	X		
78	117	1010	1	1	0-07	S	7	X	X		
78	117	900	1	1	0-09	S	9	X	X		
78	117	1801	1	1	0-10	S	9	X	X		
78	117	1724	1	1	0-11	S	9	X	X		
78	117	1741	1	1	0-11	S	6	X	X		
78	118	1515	1	2	0-12	S	8	X	X		
78	117	1645	1	1	0-14	S	6	X	X		
78	106	1145	1	1	0-16	S	6	X	X		
78	105	1620	1	1	0-16	S	15	X	X		
78	105	1620	1	1	0-19	S	8	X	X		
78	106	1145	1	1	0-24	S	18	X	X		
78	104	1510	1	1	0-24	S	9	X	X		
78	104	1510	1	1	0-25	S	20	X	X		
78	104	1250	1	1	0-25	S	12	X	X		
78	104	1250	1	1	0-26	S	11	X	X		
78	106	1530	1	1	0-26	S	13	X	X		
78	106	1530	1	1	0-30	S	10	X	X		
78	112	1407	1	1	0-32	S	160	X	X		
78	112	1606	1	1	0-37	S	160	X	X		
78	109	1645	1	1	0-45	S	14	X	X		
78	110	1822	1	1	0-46	S	8	X	X		
78	110	1654	1	1	0-46	S	31	X	X		
78	110	1654	1	1	0-46	S	13	X	X		
78	110	1654	1	1	0-50	S	12	X	X		
78	110	1312	1	1	M-01	S	9	X	X		
78	117	1022	1	1	M-03	S	110	X	X		
78	117	845	1	1	M-05	S	12	X	X		
78	114	1230	1	1	M-06	S	17	X	X		
78	114	1140	1	1	M-06	S	8	X	X		
78	114	1140	1	1	M-15	S	53	X	X		
78	115	1425	1	1	M-16	S	7	X	X		
78	115	920	1	1	M-17	S	16	X	X		X
78	115	1012	1	1	M-23	S	14	X	X		X
78	118	1402	1	1	0-02	S	26	X	X		X
78	181	840	2	1	0-02	S	76	X	X		X
78	181	840	2	1	0-03	S	76	X	X		X
78	181	925	2	1	0-03	S	25	X	X		X
78	181	925	2	1	0-05	S	7	X	X		X
78	181	1100	2	1	0-06	S	19	X	X		X
78	181	1130	2	1	0-10	S	20	X	X		X
78	181	1050	2	1	0-10	S					
78	181	1050	2	1	0-10	S					

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 VIOLATIONS REPORT FOR TOTAL COPPER (ug/l) -

LIMITS IN EFFECT:

IJC > 5.00  
 O-EPA NORM > 5.00  
 O-EPA EX > 10.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	181	950	2	1	0-14	S	22	X		X	
78	182	1037	2	2	0-14	S	22	X		X	
78	188	1235	2	1	0-19	S	120	X		X	
78	188	1300	2	1	0-20	S	1200	X		X	
78	188	1130	2	1	0-21	S	210	X		X	
78	188	1254	2	1	0-22	S	160	X		X	
78	188	1320	2	1	0-23	S	93	X		X	
78	188	1426	2	1	0-24	S	18	X		X	
78	188	1426	2	1	0-24	S	110	X		X	
78	188	1426	2	1	0-24	S	130	X		X	
78	188	1510	2	1	0-25	S	51	X		X	
78	188	1354	2	1	0-26	S	32	X		X	
78	188	1755	2	1	0-27	S	12	X		X	
78	188	1840	2	1	0-28	S	12	X		X	
78	191	1222	2	1	0-29	S	19	X		X	
78	191	1125	2	1	0-30	S	23	X		X	
78	191	1125	2	1	0-30	S	2100	X		X	
78	191	1300	2	1	0-31	S	7	X		X	
78	191	1340	2	1	0-32	S	11	X		X	
78	191	1423	2	1	0-33	S	110	X		X	
78	191	1445	2	1	0-34	S	30	X		X	
78	191	1525	2	1	0-35	S	62	X		X	
78	188	1654	2	1	0-36	S	12	X		X	
78	191	1000	2	1	0-37	S	20	X		X	
78	191	1000	2	1	0-37	S	94	X		X	
78	191	1203	2	1	0-40	S	10	X		X	
78	191	1330	2	1	0-43	S	12	X		X	
78	191	1705	2	1	0-44	S	6	X		X	
78	191	1635	2	1	0-45	S	9	X		X	
78	191	-98	2	1	0-46	S	12	X		X	
78	191	1530	2	1	0-47	S	9	X		X	
78	192	915	2	1	0-48	S	17	X		X	
78	191	1415	2	1	0-49	S	35	X		X	
78	191	1455	2	1	0-50	S	12	X		X	
78	177	924	2	1	M-01	S	130	X		X	
78	177	1050	2	1	M-02	S	110	X		X	
78	178	845	2	1	M-03	S	140	X		X	
78	178	915	2	1	M-04	S	66	X		X	
78	178	1030	2	1	M-05	S	130	X		X	
78	178	1135	2	1	M-06	S	140	X		X	
78	178	1000	2	1	M-07	S	170	X		X	
78	178	1235	2	1	M-08	S	350	X		X	
78	178	1320	2	1	M-09	S	20	X		X	
78	178	1211	2	1	M-10	S	8	X		X	
78	178	1245	2	1	M-11	S	68	X		X	
78	178	2000	2	1	M-12	S	35	X		X	
78	178	1925	2	1	M-13	S	95	X		X	
78	178	835	2	1	M-14	S	31	X		X	
78	178	917	2	1	M-15	S	50	X		X	
78	178	1315	2	1	M-16	S	140	X		X	
78	178	1347	2	1	M-17	S					

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 VIOLATIONS REPORT FOR TOTAL COPPER (ug/l).

LIMITS IN EFFECT:  
 IJC > 5.00  
 O-EPA NORM > 5.00  
 O-EPA EX > 10.00

							OBJECTIVES & STANDARDS				
YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICHDNR
78	178	1515	2	1	M-18	S	7	X			
78	178	1635	2	1	M-19	S	17	X			
78	178	1525	2	1	M-20	S	7	X			
78	178	1445	2	1	M-21	S	16	X			
78	178	1545	2	1	M-22	S	50	X			
78	178	1815	2	1	M-23	S	45	X			
78	178	1730	2	1	M-24	S	130	X			
78	178	1808	2	1	M-25	S	31	X			
78	178	1755	2	1	M-26	S	35	X			
78	178	1705	2	1	M-27	S	22	X			
78	178	1705	2	1	M-27	S	18	X			X
78	178	1705	2	1	M-27	S	20	X		X	
78	238	845	3	1	O-01	S	6	X		X	
78	240	900	3	3	O-02	S	6	X		X	
78	238	940	3	1	O-04	S	15	X		X	
78	238	1540	3	1	O-08	S	8	X		X	
78	238	1455	3	1	O-11	S	34	X		X	
78	249	1222	3	1	O-20	S	6	X		X	
78	252	1245	3	1	O-34	S	19	X		X	
78	252	1020	3	1	O-39	S	18	X		X	
78	252	1118	3	1	O-40	S	8	X		X	
78	252	1355	3	1	O-47	S	7	X		X	
78	252	1430	3	1	O-48	S	8	X		X	
78	252	1252	3	1	O-49	S	7	X		X	
78	252	1320	3	1	O-50	S	9	X		X	
78	237	1025	3	3	M-01	S	30	X			
78	237	1115	3	3	M-02	S	7	X			
78	237	1215	3	3	M-04	S	8	X			
78	235	1310	3	1	M-06	S	4000	X			
78	237	1245	3	3	M-07	S	35	X			
78	237	1245	3	3	M-07	S	6	X			
78	235	1045	3	1	M-13	S	150	X			
78	235	1110	3	1	M-14	S	69	X			
78	235	1110	3	1	M-14	S	30	X			
78	235	1150	3	1	M-15	S	950	X			
78	237	1500	3	3	M-16	S	2200	X			
78	237	1520	3	3	M-17	S	48	X			
78	237	1530	3	3	M-18	S	47	X			
78	237	1530	3	3	M-18	S	14	X			
78	235	1610	3	1	M-19	S	28	X			
78	235	1635	3	1	M-20	S	21	X			
78	235	1700	3	1	M-21	S	22	X			
78	235	1700	3	1	M-21	S	8	X			
78	238	1135	3	1	M-22	S	30	X			
78	238	1100	3	1	M-23	S	22	X			
78	238	1130	3	1	M-24	S	41	X			
78	238	1213	3	1	M-25	S	49	X			
78	238	1025	3	1	M-26	S	66	X			
78	238	930	3	1	M-27	S	270	X			
78	238	930	3	1	M-27	S	6	X			X
78	280	855	4	1	O-01	S					



PAGE 16-4  
 VIOLATIONS REPORT FOR TOTAL COPPER (ug/l) -

LIMITS IN EFFECT:  
 IJC > 5.00  
 O-EPA NORM > 5.00  
 O-EPA EX > 10.00

							OBJECTIVES & STANDARDS					
YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAREX	MICH	DNR
78	280	800	4	1	O-02	S	9	X		X		
78	280	950	4	1	O-04	S	14	X		X		X
78	284	1037	4	1	O-20	S	11	X		X		
78	284	1327	4	1	O-24	S	7	X		X		
78	288	1330	4	1	O-31	S	6	X		X		
78	288	1350	4	1	O-32	S	110	X		X		
78	288	1520	4	1	O-37	S	30	X		X		
78	288	1405	4	1	O-39	S	43	X		X		
78	288	1405	4	1	O-39	S	10	X		X		
78	288	1310	4	1	O-40	S	40	X		X		
78	288	950	4	1	O-41	S	9	X		X		
78	288	1230	4	1	O-42	S	12	X		X		
78	288	1201	4	1	O-43	S	34	X		X		
78	288	1201	4	1	O-43	S	41	X		X		
78	288	922	4	1	O-44	S	6	X		X		
78	288	1047	4	1	O-47	S	21	X		X		
78	288	930	4	1	O-48	S	19	X		X		
78	288	950	4	1	O-49	S	21	X		X		
78	288	1015	4	1	O-50	S	20	X		X		
78	276	935	4	1	M-01	S	19	X		X		
78	276	1030	4	1	M-02	S	53	X		X		
78	276	1030	4	1	M-02	S	24	X		X		
78	276	1100	4	1	M-03	S	13	X		X		
78	276	1130	4	1	M-04	S	8	X		X		
78	276	1350	4	1	M-05	S	15	X		X		
78	276	1210	4	1	M-07	S	16	X		X		
78	276	1210	4	1	M-07	S	14	X		X		
78	276	1210	4	1	M-07	S	11	X		X		
78	276	1435	4	1	M-08	S	12	X		X		
78	276	1150	4	1	M-09	S	16	X		X		
78	276	1350	4	1	M-10	S	7	X		X		
78	276	1420	4	1	M-11	S	25	X		X		
78	276	900	4	1	M-12	S	83	X		X		
78	276	942	4	1	M-13	S	8	X		X		
78	276	1020	4	1	M-14	S	10	X		X		
78	276	1020	4	1	M-14	S	6	X		X		
78	276	1450	4	1	M-16	S	70	X		X		
78	276	1625	4	1	M-18	S	8	X		X		
78	280	1010	4	1	M-26	S	15	X		X		
78	280	935	4	1	M-27	S	7	X		X		

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VIOLATIONS REPORT FOR TOTAL COPPER (ug/l) -

SUMMARY:

189 SAMPLES HAD VIOLATIONS FOR IJC	( 51.08 PERCENT)
106 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 28.65 PERCENT)
7 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 1.89 PERCENT)
189 SAMPLES HAD VIOLATIONS IN ALL	( 51.08 PERCENT)
370 SAMPLES PROCESSED	

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 VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l) .

LIMITS IN EFFECT:  
 IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICH DNR
78	118	1510	1	1	0-01	S	1100.0	X	X	X	
78	117	1420	1	1	0-02	S	1600.0	X	X	X	
78	117	1330	1	1	0-03	S	2000.0	X	X	X	
78	117	1200	1	1	0-04	S	2500.0	X	X	X	
78	117	1055	1	1	0-05	S	2500.0	X	X	X	
78	117	1010	1	1	0-06	S	1600.0	X	X	X	
78	117	1010	1	1	0-06	S	1700.0	X	X	X	
78	117	1010	1	1	0-06	S	1400.0	X	X	X	
78	117	1010	1	1	0-07	S	730.0	X	X	X	
78	117	900	1	1	0-08	S	1800.0	X	X	X	
78	117	1830	1	1	0-08	S	2900.0	X	X	X	
78	117	1801	1	1	0-09	S	2900.0	X	X	X	
78	117	1801	1	1	0-09	S	3300.0	X	X	X	
78	117	1724	1	1	0-10	S	2100.0	X	X	X	
78	117	1741	1	1	0-11	S	2100.0	X	X	X	
78	117	1741	1	1	0-11	S	2600.0	X	X	X	
78	117	1645	1	1	0-12	S	2600.0	X	X	X	
78	117	1645	1	1	0-12	S	1500.0	X	X	X	
78	117	1650	1	1	0-13	S	2500.0	X	X	X	
78	117	1650	1	1	0-13	S	2500.0	X	X	X	
78	105	1525	1	1	0-15	S	2500.0	X	X	X	
78	105	1525	1	1	0-15	S	2500.0	X	X	X	
78	105	1620	1	1	0-16	S	2700.0	X	X	X	
78	105	1620	1	1	0-16	S	3100.0	X	X	X	
78	105	1620	1	1	0-16	S	3100.0	X	X	X	
78	106	1545	1	1	0-17	S	2000.0	X	X	X	
78	106	1545	1	1	0-17	S	2000.0	X	X	X	
78	106	1300	1	1	0-18	S	3900.0	X	X	X	
78	106	1300	1	1	0-18	S	3900.0	X	X	X	
78	106	1145	1	1	0-19	S	2000.0	X	X	X	
78	106	1145	1	1	0-19	S	2000.0	X	X	X	
78	106	1015	1	1	0-20	S	2100.0	X	X	X	
78	106	1015	1	1	0-20	S	2100.0	X	X	X	
78	105	1705	1	1	0-21	S	1800.0	X	X	X	
78	105	1705	1	1	0-21	S	1800.0	X	X	X	
78	104	1445	1	1	0-22	S	2300.0	X	X	X	
78	104	1445	1	1	0-22	S	2300.0	X	X	X	
78	104	1245	1	1	0-23	S	690.0	X	X	X	
78	104	1245	1	1	0-23	S	690.0	X	X	X	
78	104	1510	1	1	0-24	S	1100.0	X	X	X	
78	104	1510	1	1	0-24	S	1100.0	X	X	X	
78	104	1510	1	1	0-24	S	490.0	X	X	X	
78	104	1510	1	1	0-24	S	490.0	X	X	X	
78	104	1250	1	1	0-25	S	1700.0	X	X	X	
78	104	1250	1	1	0-25	S	1700.0	X	X	X	
78	104	1250	1	1	0-25	S	2100.0	X	X	X	
78	104	1250	1	1	0-25	S	2100.0	X	X	X	
78	106	1530	1	1	0-26	S	2400.0	X	X	X	
78	106	1530	1	1	0-26	S	2400.0	X	X	X	
78	106	1530	1	1	0-26	S	1000.0	X	X	X	
78	106	1530	1	1	0-26	S	1000.0	X	X	X	
78	107	1510	1	1	0-27	S	800.0	X	X	X	
78	107	1510	1	1	0-27	S	800.0	X	X	X	
78	107	1410	1	1	0-28	S	3300.0	X	X	X	
78	107	1410	1	1	0-28	S	3300.0	X	X	X	
78	112	1320	1	1	0-29	S	2300.0	X	X	X	
78	112	1320	1	1	0-29	S	2300.0	X	X	X	
78	112	1407	1	1	0-30	S	700.0	X	X	X	
78	112	1407	1	1	0-30	S	700.0	X	X	X	
78	112	1529	1	1	0-31	S	1100.0	X	X	X	
78	112	1529	1	1	0-31	S	1100.0	X	X	X	
78	112	1606	1	1	0-32	S	660.0	X	X	X	
78	112	1606	1	1	0-32	S	660.0	X	X	X	
78	112	1740	1	1	0-33	S	1000.0	X	X	X	
78	112	1740	1	1	0-33	S	1000.0	X	X	X	
78	112	1755	1	1	0-34	S	1100.0	X	X	X	
78	112	1755	1	1	0-34	S	1100.0	X	X	X	
78	112	1755	1	1	0-34	S	730.0	X	X	X	
78	112	1755	1	1	0-34	S	730.0	X	X	X	
78	112	1715	1	1	0-35	S	1000.0	X	X	X	
78	112	1715	1	1	0-35	S	1000.0	X	X	X	
78	109	1100	1	1	0-36	S	1000.0	X	X	X	
78	109	1100	1	1	0-36	S	1000.0	X	X	X	
78	109	1645	1	1	0-37	S	670.0	X	X	X	
78	109	1645	1	1	0-37	S	670.0	X	X	X	
78	109	1530	1	1	0-38	S	430.0	X	X	X	
78	109	1530	1	1	0-38	S	430.0	X	X	X	
78	109	1230	1	1	0-39	S	640.0	X	X	X	
78	109	1230	1	1	0-39	S	640.0	X	X	X	
78	109	1340	1	1	0-40	S	700.0	X	X	X	
78	109	1340	1	1	0-40	S	700.0	X	X	X	
78	112	1100	1	1	0-41	S	770.0	X	X	X	
78	112	1100	1	1	0-41	S	770.0	X	X	X	
78	110	1055	1	1	0-42	S					

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 VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l) .

LIMITS IN EFFECT:  
 IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

							OBJECTIVES & STANDARDS					
YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	110	1600	1	1	O-43	S	640.0	X				
78	110	1900	1	1	O-44	S	2700.0	X	X			
78	110	1822	1	1	O-45	S	330.0	X				
78	110	1654	1	1	O-46	S	800.0	X				
78	110	1654	1	1	O-46	S	680.0	X				
78	110	1654	1	1	O-46	S	540.0	X				
78	110	1200	1	1	O-47	S	530.0	X				
78	110	1640	1	1	O-48	S	320.0	X				
78	119	1640	1	1	O-50	S	440.0	X				X
78	110	1312	1	1	O-50	S	680.0	X				X
78	117	1022	1	1	M-01	S	2100.0	X				X
78	117	931	1	1	M-02	S	350.0	X				X
78	117	845	1	1	M-03	S	1300.0	X				X
78	114	1340	1	1	M-04	S	530.0	X				X
78	114	1230	1	1	M-05	S	530.0	X				X
78	114	1240	1	1	M-07	S	310.0	X				X
78	114	1240	1	1	M-08	S	380.0	X				X
78	114	1330	1	1	M-10	S	380.0	X				X
78	114	1555	1	1	M-11	S	530.0	X				X
78	114	1622	1	1	M-12	S	600.0	X				X
78	115	1000	1	1	M-13	S	420.0	X				X
78	115	1045	1	1	M-15	S	350.0	X				X
78	115	1425	1	1	M-16	S	1500.0	X				X
78	115	920	1	1	M-17	S	1300.0	X				X
78	115	1012	1	1	M-18	S	1300.0	X				X
78	115	1115	1	1	M-19	S	850.0	X				X
78	115	1540	1	1	M-20	S	870.0	X				X
78	115	1620	1	1	M-21	S	810.0	X				X
78	115	1700	1	1	M-22	S	410.0	X				X
78	118	1324	1	1	M-23	S	720.0	X				X
78	118	1402	1	1	M-23	S	700.0	X				X
78	118	1402	1	1	M-26	S	610.0	X				X
78	118	1436	1	1	M-27	S	770.0	X				X
78	118	1537	1	1	M-27	S	1300.0	X	X			X
78	178	1735	2	1	O-01	S	1400.0	X	X			X
78	181	840	2	1	O-02	S	1800.0	X	X			X
78	181	840	2	1	O-02	S	1100.0	X	X			X
78	181	925	2	1	O-03	S	1100.0	X	X			X
78	181	925	2	1	O-03	S	340.0	X	X			X
78	181	1005	2	1	O-04	S	1500.0	X		X		
78	181	1140	2	1	O-08	S	950.0	X				
78	181	1050	2	1	O-10	S	650.0	X				
78	181	1050	2	1	O-10	S	310.0	X				
78	181	1435	2	1	O-11	S	1200.0	X		X		
78	181	1019	2	1	O-12	S	4900.0	X		X		
78	181	950	2	1	O-14	S	1400.0	X		X		
78	182	1037	2	2	O-14	S	800.0	X				
78	188	1019	2	1	O-15	S	500.0	X				
78	188	1019	2	1	O-15	S	740.0	X				
78	188	1130	2	1	O-18	S	500.0	X				
78	188	1235	2	1	O-19	S						

LIMITS IN EFFECT:  
 IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

										OBJECTIVES & STANDARDS			
YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH	VALUE	IJC	EPANORM	EPAEX	MICH	DNR	
78	188	1130	2	1	0-21	S	1800.0	X					
78	188	1254	2	1	0-22	S	1300.0	X					
78	188	1320	2	1	0-23	S	1600.0	X					
78	188	1426	2	1	0-24	S	810.0	X					
78	188	1426	2	1	0-24	S	760.0	X					
78	188	1510	2	1	0-25	S	340.0	X					
78	188	1354	2	1	0-26	S	630.0	X					
78	188	1755	2	1	0-27	S	540.0	X					
78	188	1840	2	1	0-28	S	340.0	X					
78	191	1222	2	1	0-29	S	1600.0	X	X				
78	191	1125	2	1	0-30	S	5200.0	X	X				
78	191	1125	2	1	0-30	S	8700.0	X	X				
78	191	1300	2	1	0-31	S	1900.0	X	X				
78	191	1340	2	1	0-32	S	1800.0	X	X				
78	191	1423	2	1	0-33	S	1800.0	X	X				
78	191	1445	2	1	0-34	S	1700.0	X	X				
78	191	1525	2	1	0-35	S	1200.0	X	X				
78	191	1000	2	1	0-37	S	350.0	X					
78	191	1000	2	1	0-37	S	510.0	X					
78	191	1330	2	1	0-43	S	330.0	X					
78	192	915	2	1	0-48	S	570.0	X				X	
78	177	924	2	1	M-01	S	3500.0	X				X	
78	177	1050	2	1	M-02	S	1900.0	X				X	
78	177	1050	2	1	M-02	S	370.0	X				X	
78	178	845	2	1	M-03	S	760.0	X				X	
78	178	915	2	1	M-04	S	1000.0	X				X	
78	178	1030	2	1	M-05	S	670.0	X				X	
78	178	1135	2	1	M-06	S	510.0	X				X	
78	178	1235	2	1	M-07	S	1100.0	X				X	
78	178	1235	2	1	M-08	S	570.0	X				X	
78	178	1320	2	1	M-08	S	460.0	X				X	
78	178	1211	2	1	M-09	S	410.0	X				X	
78	178	1245	2	1	M-10	S	1300.0	X				X	
78	178	2000	2	1	M-11	S	1300.0	X				X	
78	178	1925	2	1	M-12	S	880.0	X				X	
78	178	835	2	1	M-13	S	510.0	X				X	
78	178	917	2	1	M-14	S	440.0	X				X	
78	178	1315	2	1	M-15	S	390.0	X				X	
78	178	1347	2	1	M-16	S	1100.0	X				X	
78	178	1515	2	1	M-17	S	1500.0	X				X	
78	178	1635	2	1	M-18	S	840.0	X				X	
78	178	1525	2	1	M-19	S	450.0	X				X	
78	178	1445	2	1	M-20	S	360.0	X				X	
78	178	1545	2	1	M-21	S	310.0	X				X	
78	178	1815	2	1	M-22	S	940.0	X				X	
78	178	1815	2	1	M-23	S	1100.0	X				X	
78	178	1730	2	1	M-23	S	760.0	X				X	
78	178	1808	2	1	M-24	S	540.0	X				X	
78	178				M-25	S	410.0	X				X	

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 VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l).

LIMITS IN EFFECT:  
 IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICH DNR
						S	1100.0	X			X
						S	1300.0	X			X
78	178	1755	2	1	M-26	S	1800.0	X	X	X	
78	178	1705	2	1	M-27	S	1400.0	X	X	X	
78	238	845	3	1	O-01	S	1300.0	X	X	X	
78	240	900	3	3	O-02	S	1200.0	X	X	X	
78	238	905	3	1	O-03	S	800.0	X	X	X	
78	238	940	3	1	O-04	S	530.0	X			
78	238	1010	3	1	O-05	S	350.0	X			
78	238	1043	3	1	O-06	S	1800.0	X	X		
78	238	1320	3	1	O-07	S	1200.0	X	X		
78	238	1540	3	1	O-08	S	1200.0	X	X		
78	238	1510	3	1	O-09	S	480.0	X			
78	239	1400	3	2	O-10	S	1500.0	X	X		
78	238	1455	3	1	O-11	S	2400.0	X	X		
78	238	1410	3	1	O-12	S	980.0	X			
78	238	1340	3	1	O-14	S	940.0	X			
78	249	930	3	1	O-15	S	390.0	X			
78	249	1000	3	1	O-16	S	310.0	X			
78	249	1125	3	1	O-17	S	2700.0	X	X		
78	249	1204	3	1	O-19	S	550.0	X			
78	249	1030	3	1	O-21	S	840.0	X			
78	249	1105	3	1	O-22	S	410.0	X			
78	249	1130	3	1	O-23	S	380.0	X			
78	249	1150	3	1	O-26	S	2000.0	X	X		
78	249	1150	3	1	O-26	S	330.0	X			
78	249	1150	3	1	O-29	S	1300.0	X	X		
78	252	1054	3	1	O-30	S	1800.0	X	X		
78	252	1015	3	1	O-31	S	1000.0	X			
78	252	1113	3	1	O-32	S	1100.0	X	X		
78	252	1155	3	1	O-33	S	1100.0	X			
78	252	1220	3	1	O-34	S	860.0	X			
78	252	1245	3	1	O-34	S	450.0	X			
78	252	1245	3	1	O-35	S	650.0	X			
78	252	1315	3	1	O-37	S	1400.0	X	X		
78	252	915	3	1	O-43	S	1700.0	X			
78	252	1227	3	1	O-44	S	1800.0	X			
78	253	905	3	2	O-44	S	630.0	X			
78	237	1025	3	3	M-01	S	1900.0	X			
78	237	1115	3	3	M-02	S	510.0	X			
78	237	1155	3	3	M-03	S	520.0	X			
78	237	1215	3	3	M-04	S	390.0	X			
78	237	1245	3	3	M-07	S	520.0	X			
78	237	1245	3	3	M-07	S	890.0	X			
78	237	1245	3	3	M-07	S	580.0	X			
78	237	1420	3	3	M-10	S	910.0	X			
78	237	1440	3	3	M-11	S	790.0	X			
78	235	1010	3	1	M-12	S	600.0	X			
78	237	1500	3	3	M-16	S	610.0	X			
78	237	1520	3	3	M-17	S					
78	237	1530	3	3	M-18	S					
78	237	1530	3	3	M-18	S					

VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l) -

LIMITS IN EFFECT:

IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

							OBJECTIVES & STANDARDS					
YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	238	1135	3	1	M-22	S	450.0	X				X
78	238	1100	3	1	M-23	S	1100.0	X				X
78	238	1130	3	1	M-24	S	410.0	X				X
78	238	1213	3	1	M-25	S	420.0	X				X
78	238	1025	3	1	M-26	S	720.0	X				X
78	238	930	3	1	M-27	S	2300.0	X				X
78	238	930	3	1	M-27	S	2100.0	X		X		X
78	280	855	4	1	O-01	S	1600.0	X	X			X
78	280	800	4	1	O-02	S	2000.0	X	X			X
78	280	950	4	1	O-04	S	1000.0	X				
78	280	1012	4	1	O-05	S	880.0	X				
78	280	1040	4	1	O-06	S	950.0	X				
78	280	1340	4	1	O-07	S	790.0	X				
78	280	1340	4	1	O-07	S	950.0	X		X		
78	280	1535	4	1	O-08	S	1800.0	X	X			
78	280	1535	4	1	O-08	S	1900.0	X	X			
78	280	1510	4	1	O-09	S	7300.0	X	X			
78	280	1445	4	1	O-10	S	5500.0	X				
78	280	1518	4	1	O-11	S	520.0	X				
78	280	1405	4	1	O-12	S	910.0	X				
78	280	1437	4	1	O-13	S	560.0	X		X		
78	280	1335	4	1	O-14	S	2000.0	X				
78	284	1110	4	1	O-15	S	580.0	X				
78	284	1200	4	1	O-17	S	330.0	X				
78	284	1140	4	1	O-18	S	350.0	X				
78	284	1037	4	1	O-20	S	420.0	X				
78	284	1155	4	1	O-21	S	960.0	X				
78	284	1310	4	1	O-22	S	600.0	X				
78	284	1327	4	1	O-24	S	400.0	X				
78	284	1327	4	1	O-24	S	390.0	X				
78	284	1415	4	1	O-25	S	380.0	X				
78	284	1400	4	1	O-26	S	660.0	X				
78	284	1400	4	1	O-26	S	650.0	X				
78	284	1523	4	1	O-28	S	350.0	X		X		
78	288	1230	4	1	O-29	S	1500.0	X		X		
78	288	1310	4	1	O-30	S	1700.0	X		X		
78	288	1330	4	1	O-31	S	4900.0	X				
78	288	1350	4	1	O-32	S	1000.0	X				
78	288	1130	4	1	O-33	S	880.0	X			X	
78	288	1058	4	1	O-34	S	1200.0	X			X	
78	288	1058	4	1	O-34	S	1300.0	X				
78	288	1035	4	1	O-35	S	760.0	X				
78	284	1703	4	1	O-36	S	390.0	X				
78	288	1520	4	1	O-37	S	980.0	X				
78	288	1450	4	1	O-38	S	610.0	X				
78	288	1405	4	1	O-39	S	570.0	X				
78	288	1405	4	1	O-39	S	570.0	X				
78	288	1310	4	1	O-40	S	930.0	X				
78	288	950	4	1	O-41	S	1000.0	X				

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 VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l) -

LIMITS IN EFFECT:  
 IJC > 300.00  
 O-EPA NORM > 1000.00  
 O-EPA EX > 1000.00  
 MICH DNR > 300.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS				
								IJC	EPANORM	EPAEX	MICHDNR	
								X				
							970.0	X				
							880.0	X				
78	288	1230	4	1	O-42	S	1000.0	X				
78	288	1201	4	1	O-43	S	2400.0	X		X		
78	288	1201	4	1	O-43	S	2500.0	X		X		
78	288	922	4	1	O-44	S	1000.0	X				
78	288	922	4	1	O-44	S	1000.0	X				
78	288	1137	4	1	O-45	S	1000.0	X				
78	288	1120	4	1	O-46	S	870.0	X				
78	288	1120	4	1	O-47	S	1200.0	X		X		
78	288	1047	4	1	O-48	S	980.0	X				
78	288	930	4	1	O-49	S	950.0	X				X
78	288	950	4	1	O-50	S	3900.0	X				X
78	288	1015	4	1	M-01	S	3700.0	X				X
78	276	935	4	1	M-02	S	410.0	X				X
78	276	1030	4	1	M-02	S	5000.0	X				X
78	276	1030	4	1	M-03	S	4700.0	X				X
78	276	1100	4	1	M-04	S	1900.0	X				X
78	276	1130	4	1	M-05	S	1400.0	X				X
78	276	1350	4	1	M-06	S	3200.0	X				X
78	276	1230	4	1	M-07	S	3200.0	X				X
78	276	1210	4	1	M-07	S	2300.0	X				X
78	276	1210	4	1	M-07	S	1300.0	X				X
78	276	1210	4	1	M-08	S	1200.0	X				X
78	276	1435	4	1	M-09	S	3100.0	X				X
78	276	1150	4	1	M-10	S	6200.0	X				X
78	276	1350	4	1	M-11	S	2300.0	X				X
78	276	1420	4	1	M-12	S	1100.0	X				X
78	276	900	4	1	M-13	S	1000.0	X				X
78	276	942	4	1	M-14	S	1100.0	X				X
78	276	1020	4	1	M-14	S	830.0	X				X
78	276	1020	4	1	M-14	S	1000.0	X				X
78	276	1020	4	1	M-15	S	1700.0	X				X
78	276	1105	4	1	M-16	S	1400.0	X				X
78	276	1450	4	1	M-17	S	1800.0	X				X
78	276	1515	4	1	M-18	S	410.0	X				X
78	276	1625	4	1	M-19	S	440.0	X				X
78	276	1655	4	1	M-19	S	320.0	X				X
78	276	1655	4	1	M-20	S	680.0	X				X
78	276	1630	4	1	M-21	S	490.0	X				X
78	276	1600	4	1	M-22	S	380.0	X				X
78	280	1040	4	1	M-23	S	370.0	X				X
78	281	1200	4	2	M-24	S	510.0	X				X
78	280	1200	4	1	M-25	S	310.0	X				X
78	279	1155	4	1	M-26	S	1600.0	X				X
78	280	1010	4	1	M-27	S	930.0	X				X
78	280	935	4	1	M-27	S						
78	280	935	4			S						



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VIOLATIONS REPORT FOR TOTAL IRON<W> (ug/l) -

SUMMARY:

289 SAMPLES HAD VIOLATIONS FOR IJC	( 78.11 PERCENT)
84 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 22.70 PERCENT)
15 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 4.05 PERCENT)
108 SAMPLES HAD VIOLATIONS FOR MICH DNR	( 29.19 PERCENT)
289 SAMPLES HAD VIOLATIONS IN ALL	( 78.11 PERCENT)
370 SAMPLES PROCESSED	

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 VIOLATIONS REPORT FOR TOTAL MERCURY (ug/l) .

LIMITS IN EFFECT:  
 IJC > 0.20  
 O-EPA NORM > 0.20  
 O-EPA EX > 0.20  
 MICH DNR > 0.05

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	105	1705	1	1	0-21	S	0.459	X			X
78	106	1530	1	1	0-26	S	0.250	X			X

SUMMARY:  
 2 SAMPLES HAD VIOLATIONS FOR IJC ( 0.54 PERCENT)  
 2 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 0.54 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.00 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR MICH DNR ( 0.00 PERCENT)  
 2 SAMPLES HAD VIOLATIONS IN ALL ( 0.54 PERCENT)  
 370 SAMPLES PROCESSED

PAGE 19- 1  
 VIOLATIONS REPORT FOR TOTAL MANGANESE<W> (ug/l) -

LIMITS IN EFFECT:  
 O-EPA NORM >

50.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	118	1510	1	1	0-01	S	53.000					X
78	117	1420	1	1	0-02	S	60.000					X
78	117	1330	1	1	0-03	S	76.000					X
78	117	1200	1	1	0-04	S	65.000					X
78	117	1055	1	1	0-05	S	81.000					X
78	117	1010	1	1	0-06	S	56.000					X
78	117	1010	1	1	0-06	S	59.000					X
78	117	1830	1	1	0-08	S	83.000					X
78	117	1801	1	1	0-09	S	73.000					X
78	117	1724	1	1	0-10	S	83.000					X
78	117	1741	1	1	0-11	S	67.000					X
78	117	1645	1	1	0-12	S	80.000					X
78	117	1650	1	1	0-13	S	57.000					X
78	105	1525	1	1	0-15	S	53.000					X
78	105	1620	1	1	0-16	S	77.000					X
78	105	1620	1	1	0-16	S	56.000					X
78	106	1545	1	1	0-17	S	63.000					X
78	106	1300	1	1	0-18	S	53.000					X
78	106	1015	1	1	0-20	S	51.000					X
78	105	1705	1	1	0-21	S	73.000					X
78	104	1445	1	1	0-22	S	64.000					X
78	104	1245	1	1	0-23	S	78.000					X
78	104	1250	1	1	0-25	S	54.000					X
78	106	1530	1	1	0-26	S	51.000					X
78	112	1320	1	1	0-29	S	92.000					X
78	112	1407	1	1	0-30	S	76.000					X
78	109	1645	1	1	0-37	S	60.000					X
78	110	1900	1	1	0-44	S	130.000					X
78	181	840	2	1	0-02	S	62.000					X
78	181	840	2	1	0-02	S	75.000					X
78	181	925	2	1	0-03	S	53.000					X
78	181	925	2	1	0-03	S	58.000					X
78	181	1140	2	1	0-08	S	77.000					X
78	181	1019	2	1	0-12	S	72.000					X
78	181	950	2	1	0-14	S	65.000					X
78	191	1125	2	1	0-30	S	140.000					X
78	191	1125	2	1	0-30	S	210.000					X
78	191	1300	2	1	0-31	S	86.000					X
78	191	1340	2	1	0-32	S	64.000					X
78	191	1423	2	1	0-33	S	62.000					X
78	191	1445	2	1	0-34	S	65.000					X
78	238	845	3	1	0-01	S	65.000					X
78	240	900	3	3	0-02	S	88.000					X
78	238	1540	3	1	0-08	S	74.000					X
78	238	1410	3	1	0-12	S	56.000					X
78	238	1340	3	1	0-14	S	67.000					X
78	249	1030	3	1	0-21	S	110.000					X
78	252	1054	3	1	0-29	S	95.000					X
78	252	1015	3	1	0-30	S	140.000					X
78	252	1113	3	1	0-31	S	61.000					X
78	252	1155	3	1	0-32	S	83.000					X

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 VIOLATIONS REPORT FOR TOTAL MANGANESE<W> (ug/l) -

LIMITS IN EFFECT:  
 O-EPA NORM > 50.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS					
								IJC	EPANORM	EPAEX	MICHDNR		
											X		
							54.000				X		
78	252	1245	3	1	0-34	S	57.000				X		
78	253	905	3	2	0-44	S	56.000				X		
78	280	855	4	1	0-01	S	81.000				X		
78	280	800	4	1	0-02	S	70.000				X		
78	280	1535	4	1	0-08	S	78.000				X		
78	280	1535	4	1	0-08	S	170.000				X		
78	280	1510	4	1	0-09	S	150.000				X		
78	280	1445	4	1	0-10	S	62.000				X		
78	280	1335	4	1	0-14	S	53.000				X		
78	280	1230	4	1	0-29	S	67.000				X		
78	288	1310	4	1	0-30	S	110.000				X		
78	288	1330	4	1	0-31	S	98.000				X		
78	288	922	4	1	0-44	S	110.000				X		
78	288	922	4	1	0-44	S							

SUMMARY:  
 65 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 17.57 PERCENT)  
 65 SAMPLES HAD VIOLATIONS IN ALL ( 17.57 PERCENT)  
 370 SAMPLES PROCESSED

PAGE 20- 1  
 VIOLATIONS REPORT FOR TOTAL LEAD (ug/l) -

LIMITS IN EFFECT:

IJC	>	25.00
O-EPA NORM	>	30.00
O-EPA EX	>	30.00
MICH DNR	>	30.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
							45	X		X		
78	117	1010	1	1	O-06	S	66	X				X
78	237	1215	3	3	M-04	S	32	X				X
78	235	1110	3	1	M-14	S	33	X				X
78	237	1530	3	3	M-18	S	34	X				X
78	235	1635	3	1	M-20	S	37	X				X
78	238	1213	3	1	M-25	S	44	X				X
78	238	1025	3	1	M-26	S	46	X				X
78	238	930	3	1	M-27	S	30	X				
78	238	930	3	1	M-27	S						

SUMMARY:

9 SAMPLES HAD VIOLATIONS FOR IJC	( 2.43 PERCENT)
1 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	( 0.27 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR O-EPA EX	( 0.00 PERCENT)
7 SAMPLES HAD VIOLATIONS FOR MICH DNR	( 1.89 PERCENT)
9 SAMPLES HAD VIOLATIONS IN ALL	( 2.43 PERCENT)
370 SAMPLES PROCESSED	

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 VIOLATIONS REPORT FOR TOTAL SELENIUM (ug/l) -

LIMITS IN EFFECT:

IJC	>	10.00
O-EPA NORM	>	10.00
O-EPA EX	>	50.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
							15.000	X			X	
78	118	1515	1	2	O-11	S	16.000	X			X	
78	110	1654	1	1	O-46	S	14.000	X			X	
78	110	1654	1	1	O-46	S	55.000	X				
78	115	1700	1	1	M-21	S	12.000	X			X	
78	284	1330	4	1	O-23	S	12.000	X			X	
78	288	1058	4	1	O-34	S						

SUMMARY:

6 SAMPLES HAD VIOLATIONS FOR IJC	(	1.62 PERCENT)
5 SAMPLES HAD VIOLATIONS FOR O-EPA NORM	(	1.35 PERCENT)
0 SAMPLES HAD VIOLATIONS FOR O-EPA EX	(	0.00 PERCENT)
6 SAMPLES HAD VIOLATIONS IN ALL	(	1.62 PERCENT)
370 SAMPLES PROCESSED		

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 VIOLATIONS REPORT FOR TOTAL ZINC (ug/l) -

LIMITS IN EFFECT:

IJC > 30.00  
 O-EPA NORM > 30.00  
 O-EPA EX > 55.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	117	1055	1	1	0-05	S	46	X				X
78	117	1010	1	1	0-06	S	130	X				X
78	118	1515	1	2	0-11	S	81	X				X
78	105	1620	1	1	0-16	S	73	X				X
78	106	1015	1	1	0-20	S	170	X				X
78	104	1250	1	1	0-25	S	34	X				X
78	104	1250	1	1	0-25	S	130	X				X
78	104	1250	1	1	0-26	S	110	X				X
78	106	1530	1	1	0-27	S	55	X				X
78	107	1510	1	1	0-30	S	55	X				X
78	112	1407	1	1	0-32	S	46	X				X
78	112	1606	1	1	0-34	S	98	X				X
78	112	1755	1	1	0-46	S	34	X				X
78	110	1654	1	1	0-46	S	100	X				X
78	110	1654	1	1	0-46	S	76	X				X
78	110	1654	1	1	M-02	S	31	X				
78	117	931	1	1	M-06	S	33	X				
78	114	1140	1	1	M-06	S	150	X				
78	114	1140	1	1	M-07	S	74	X				
78	114	1240	1	1	M-08	S	91	X				
78	114	1330	1	1	M-09	S	43	X				
78	114	1420	1	1	M-10	S	34	X				
78	114	1555	1	1	M-11	S	100	X				
78	114	1622	1	1	M-12	S	74	X				
78	115	1000	1	1	M-13	S	92	X				
78	115	1045	1	1	M-14	S	120	X				
78	115	1135	1	1	M-14	S	190	X				
78	115	1135	1	1	M-15	S	42	X				
78	115	1425	1	1	M-16	S	74	X				
78	115	920	1	1	M-17	S	91	X				
78	115	1012	1	1	M-18	S	96	X				
78	115	1115	1	1	M-19	S	74	X				
78	115	1540	1	1	M-20	S	110	X				
78	115	1620	1	1	M-21	S	76	X				
78	115	1700	1	1	M-21	S	58	X				
78	115	1700	1	1	M-21	S	120	X				
78	115	1700	1	1	M-22	S	41	X				
78	118	1324	1	1	M-23	S	61	X				
78	118	1402	1	1	M-23	S	180	X				
78	118	1402	1	1	M-26	S	33	X				
78	118	1436	1	1	M-27	S	82	X				
78	118	1537	1	1	0-01	S	210	X		X		X
78	178	1735	2	1	0-02	S	120	X		X		X
78	181	840	2	1	0-02	S	64	X		X		X
78	181	840	2	1	0-03	S	150	X		X		X
78	181	925	2	1	0-03	S	160	X		X		X
78	181	925	2	1	0-04	S	110	X		X		X
78	181	1005	2	1	0-05	S	130	X		X		X
78	181	1100	2	1	0-06	S	110	X		X		X
78	181	1130	2	1	0-06	S						

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 VIOLATIONS REPORT FOR TOTAL ZINC (ug/l) -

LIMITS IN EFFECT:

IJC > 30.00  
 O-EPA NORM > 30.00  
 O-EPA EX > 55.00

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	OBJECTIVES & STANDARDS			
								IJC	EPANORM	EPAEX	MICHDNR
78	181	1200	2	1	0-07	S	72	X		X	
78	181	1140	2	1	0-08	S	160	X		X	
78	181	1050	2	1	0-10	S	120	X		X	
78	181	1050	2	1	0-10	S	170	X		X	
78	181	1435	2	1	0-11	S	170	X		X	
78	181	1019	2	1	0-12	S	59	X		X	
78	181	1320	2	1	0-13	S	98	X		X	
78	181	950	2	1	0-14	S	110	X		X	
78	181	1037	2	2	0-14	S	51	X		X	
78	182	1037	2	2	0-14	S	120	X		X	
78	182	1037	2	1	0-15	S	84	X		X	
78	188	1019	2	1	0-15	S	75	X		X	
78	188	1019	2	1	0-16	S	120	X		X	
78	188	1110	2	1	0-17	S	89	X		X	
78	188	1038	2	1	0-18	S	79	X		X	
78	188	1130	2	1	0-19	S	110	X		X	
78	188	1235	2	1	0-20	S	95	X		X	
78	188	1300	2	1	0-21	S	220	X		X	
78	188	1130	2	1	0-22	S	61	X		X	
78	188	1254	2	1	0-23	S	120	X		X	
78	188	1320	2	1	0-24	S	200	X		X	
78	188	1426	2	1	0-24	S	210	X		X	
78	188	1426	2	1	0-25	S	96	X		X	
78	188	1510	2	1	0-26	S	140	X		X	
78	188	1354	2	1	0-27	S	72	X		X	
78	188	1755	2	1	0-28	S	56	X		X	
78	188	1840	2	1	0-29	S	100	X		X	
78	191	1222	2	1	0-30	S	120	X		X	
78	191	1125	2	1	0-30	S	83	X		X	
78	191	1125	2	1	0-31	S	80	X		X	
78	191	1300	2	1	0-32	S	78	X		X	
78	191	1340	2	1	0-33	S	80	X		X	
78	191	1423	2	1	0-34	S	90	X		X	
78	191	1445	2	1	0-35	S	73	X		X	
78	191	1525	2	1	0-36	S	72	X		X	
78	188	1654	2	1	0-37	S	80	X		X	
78	191	1000	2	1	0-37	S	120	X		X	
78	191	1000	2	1	0-38	S	63	X		X	
78	191	1025	2	1	0-39	S	83	X		X	
78	191	1120	2	1	0-39	S	68	X		X	
78	191	1120	2	1	0-40	S	70	X		X	
78	191	1203	2	1	0-41	S	80	X		X	
78	191	-98	2	1	0-42	S	41	X		X	
78	191	1250	2	1	0-43	S	93	X		X	
78	191	1330	2	1	0-44	S	55	X		X	
78	191	1705	2	1	0-45	S	66	X		X	
78	191	1635	2	1	0-46	S	110	X		X	
78	191	-98	2	1	0-47	S	87	X		X	
78	191	1530	2	1	0-48	S	99	X		X	
78	192	915	2	1	0-49	S	84	X		X	
78	191	1415	2	1	0-49	S					



LIMITS IN EFFECT:  
 IJC > 30.00  
 O-EPA NORM > 30.00  
 O-EPA EX > 55.00

OBJECTIVES & STANDARDS

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICHDNR
					O-50	S	60	X		X	
78	191	1455	2	1	M-01	S	64	X			
78	177	924	2	1	M-02	S	40	X			
78	177	1050	2	1	M-02	S	92	X			
78	177	1050	2	1	M-02	S	38	X			
78	178	826	2	2	M-02	S	35	X			
78	178	1235	2	1	M-08	S	59	X			
78	178	1235	2	1	M-08	S	32	X			
78	178	2000	2	1	M-12	S	41	X			
78	178	1315	2	1	M-16	S	36	X			
78	178	1525	2	1	M-20	S	56	X			
78	178	1445	2	1	M-21	S	33	X			
78	178	1545	2	1	M-22	S	39	X			
78	178	1815	2	1	M-23	S	59	X			
78	178	1730	2	1	M-24	S	39	X			
78	178	1808	2	1	M-25	S	56	X			
78	178	1755	2	1	M-26	S	51	X			
78	178	1705	2	1	M-27	S	50	X			
78	178	1705	2	1	M-27	S	45	X		X	
78	238	845	3	1	O-01	S	45	X		X	
78	238	845	3	3	O-02	S	45	X		X	
78	240	900	3	1	O-04	S	31	X		X	
78	238	940	3	1	O-08	S	51	X		X	
78	238	1540	3	1	O-11	S	52	X		X	
78	238	1455	3	1	O-14	S	34	X		X	
78	238	1340	3	1	O-21	S	31	X		X	
78	249	1030	3	1	O-23	S	70	X		X	
78	249	1130	3	1	O-38	S	99	X		X	
78	252	945	3	1	O-39	S	220	X		X	
78	252	1020	3	1	O-39	S	140	X		X	
78	252	1020	3	1	O-40	S	110	X		X	
78	252	1118	3	1	O-41	S	120	X		X	
78	252	1405	3	1	O-42	S	120	X		X	
78	252	1155	3	1	O-43	S	100	X		X	
78	252	1227	3	1	O-47	S	210	X		X	
78	252	1355	3	1	O-48	S	190	X		X	
78	252	1430	3	1	O-49	S	140	X		X	
78	252	1252	3	1	O-50	S	180	X		X	
78	252	1320	3	3	M-01	S	83	X			
78	237	1025	3	3	M-02	S	41	X			
78	237	1115	3	3	M-03	S	35	X			
78	237	1155	3	3	M-04	S	33	X			
78	237	1215	3	3	M-07	S	97	X			
78	237	1245	3	3	M-07	S	92	X			
78	235	1500	3	1	M-08	S	90	X			
78	235	1230	3	1	M-09	S	56	X			
78	237	1420	3	3	M-10	S	82	X			
78	237	1440	3	3	M-11	S	150	X			
78	235	1010	3	1	M-12	S	150	X			
78	235	1045	3	1	M-13	S	300	X			
78	235	1110	3	1	M-14	S	310	X			
78	235	1110	3	1	M-14	S					

LIMITS IN EFFECT:  
 IJC > 30.00  
 O-EPA NORM > 30.00  
 O-EPA EX > 55.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	235	1150	3	1	M-15	S	310	X				
78	237	1500	3	3	M-16	S	200	X				
78	237	1520	3	3	M-17	S	190	X				
78	237	1530	3	3	M-18	S	190	X				
78	237	1530	3	3	M-18	S	150	X				
78	237	1530	3	1	M-19	S	240	X				
78	235	1610	3	1	M-20	S	330	X				
78	235	1635	3	1	M-21	S	240	X				
78	235	1700	3	1	M-21	S	120	X				
78	235	1700	3	1	M-22	S	270	X				
78	238	1135	3	1	M-23	S	200	X				
78	238	1100	3	1	M-24	S	290	X				
78	238	1130	3	1	M-24	S	260	X				
78	238	1213	3	1	M-25	S	310	X				
78	238	1025	3	1	M-26	S	250	X				
78	238	930	3	1	M-27	S	680	X				
78	238	930	3	1	M-27	S	45	X		X		
78	280	855	4	1	O-01	S	40	X		X		
78	280	800	4	1	O-02	S	31	X		X		
78	280	950	4	1	O-04	S	64	X		X		
78	280	1340	4	1	O-07	S	50	X		X		
78	280	1535	4	1	O-08	S	61	X		X		
78	280	1510	4	1	O-09	S	65	X		X		
78	280	1445	4	1	O-10	S	43	X		X		
78	280	1405	4	1	O-12	S	32	X		X		
78	280	1335	4	1	O-14	S	31	X		X		
78	284	1200	4	1	O-17	S	32	X		X		
78	284	1140	4	1	O-18	S	42	X		X		
78	284	1105	4	1	O-19	S	34	X		X		
78	284	1037	4	1	O-20	S	42	X		X		
78	284	1330	4	1	O-23	S	68	X		X		
78	284	1327	4	1	O-24	S	38	X		X		
78	284	1400	4	1	O-26	S	49	X		X		
78	288	1330	4	1	O-31	S	62	X		X		
78	288	1350	4	1	O-32	S	40	X		X		
78	284	1703	4	1	O-36	S	51	X		X		
78	288	1520	4	1	O-37	S	41	X		X		
78	288	1405	4	1	O-39	S	35	X		X		
78	288	1405	4	1	O-39	S	31	X		X		
78	288	1310	4	1	O-40	S	46	X		X		
78	288	950	4	1	O-41	S	53	X		X		
78	288	1201	4	1	O-43	S	37	X		X		
78	288	1201	4	1	O-43	S	36	X		X		
78	288	922	4	1	O-44	S	34	X		X		
78	288	922	4	1	O-44	S	33	X		X		
78	288	930	4	1	O-48	S	50	X		X		
78	288	950	4	1	O-49	S	44	X		X		
78	288	1015	4	1	O-50	S	150	X		X		
78	276	935	4	1	M-01	S	130	X				
78	276	1030	4	1	M-02	S	120	X				
78	276	1030	4	1	M-02	S						

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 VIOLATIONS REPORT FOR TOTAL ZINC (ug/l) .

LIMITS IN EFFECT:

IJC > 30.00  
 O-EPA NORM > 30.00  
 O-EPA EX > 55.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	276	1100	4	1	M-03	S	99	X				
78	276	1130	4	1	M-04	S	64	X				
78	276	1350	4	1	M-05	S	66	X				
78	276	1230	4	1	M-06	S	68	X				
78	276	1210	4	1	M-07	S	55	X				
78	276	1210	4	1	M-07	S	53	X				
78	276	1210	4	1	M-07	S	60	X				
78	276	1210	4	1	M-07	S	45	X				
78	276	1435	4	1	M-08	S	62	X				
78	276	1150	4	1	M-09	S	61	X				
78	276	1350	4	1	M-10	S	73	X				
78	276	1420	4	1	M-11	S	73	X				
78	276	900	4	1	M-12	S	49	X				
78	276	942	4	1	M-13	S	45	X				
78	276	1020	4	1	M-14	S	51	X				
78	276	1105	4	1	M-15	S	73	X				
78	276	1450	4	1	M-16	S	35	X				
78	276	1625	4	1	M-18	S	53	X				
78	279	1155	4	1	M-25	S	35	X				
78	280	1010	4	1	M-26	S	32	X				
78	280	935	4	1	M-27	S	120	X				

SUMMARY:

219 SAMPLES HAD VIOLATIONS FOR IJC ( 59.19 PERCENT)  
 124 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 33.51 PERCENT)  
 6 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 1.62 PERCENT)

219 SAMPLES HAD VIOLATIONS IN ALL ( 59.19 PERCENT)  
 370 SAMPLES PROCESSED

PAGE 23- 1  
 VIOLATIONS REPORT FOR TOTAL NICKEL (ug/l) .

LIMITS IN EFFECT:  
 IJC > 25.00  
 O-EPA NORM > 25.00  
 O-EPA EX > 200.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICHDNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICHDNR
							40.000	X		X	
78	118	1510	1	1	0-01	S	33.000	X		X	
78	117	1330	1	1	0-03	S	56.000	X		X	
78	117	1200	1	1	0-04	S	33.000	X		X	
78	117	1055	1	1	0-05	S	72.000	X		X	
78	117	1010	1	1	0-06	S	38.000	X		X	
78	117	1010	1	1	0-06	S	54.000	X		X	
78	117	1010	1	1	0-06	S	30.000	X		X	
78	117	1724	1	1	0-10	S	26.000	X		X	
78	117	1724	1	2	0-11	S	43.000	X		X	
78	118	1515	1	2	0-11	S	39.000	X		X	
78	118	1515	1	1	0-13	S	61.000	X		X	
78	117	1650	1	1	0-22	S	51.000	X		X	
78	104	1445	1	1	0-25	S	33.000	X		X	
78	104	1250	1	1	0-25	S	40.000	X		X	
78	104	1250	1	1	0-26	S	49.000	X		X	
78	106	1530	1	1	0-26	S	45.000	X		X	
78	106	1530	1	1	0-27	S	48.000	X		X	
78	107	1510	1	1	0-29	S	230.000	X		X	
78	112	1320	1	1	0-30	S	100.000	X		X	
78	112	1407	1	1	0-32	S	28.000	X		X	
78	112	1606	1	1	0-33	S	43.000	X		X	
78	112	1740	1	1	0-34	S	45.000	X		X	
78	112	1755	1	1	0-34	S	43.000	X		X	
78	112	1755	1	1	0-46	S	39.000	X		X	
78	110	1654	1	1	M-01	S	100.000	X		X	
78	117	1022	1	1	M-06	S	93.000	X		X	
78	114	1140	1	1	M-06	S	96.000	X		X	
78	114	1140	1	1	M-07	S	90.000	X		X	
78	114	1240	1	1	M-09	S	33.000	X		X	
78	114	1420	1	1	M-11	S	91.000	X		X	
78	115	1000	1	1	M-12	S	76.000	X		X	
78	115	1045	1	1	M-13	S	59.000	X		X	
78	115	1135	1	1	M-14	S	59.000	X		X	
78	115	1135	1	1	M-14	S	93.000	X		X	
78	115	1425	1	1	M-15	S	99.000	X		X	
78	115	1425	1	1	M-15	S	66.000	X		X	
78	115	920	1	1	M-16	S	45.000	X		X	
78	115	1012	1	1	M-17	S	54.000	X		X	
78	115	1115	1	1	M-18	S	180.000	X		X	
78	115	1540	1	1	M-19	S	74.000	X		X	
78	115	1620	1	1	M-20	S	36.000	X		X	
78	115	1700	1	1	M-21	S	40.000	X		X	
78	115	1700	1	1	M-21	S	31.000	X		X	
78	118	1324	1	1	M-22	S	36.000	X		X	
78	118	1402	1	1	M-23	S	140.000	X		X	
78	118	1402	1	1	M-23	S	49.000	X		X	
78	118	1436	1	1	M-26	S	83.000	X		X	
78	118	1537	1	1	M-27	S	35.000	X		X	
78	181	840	2	1	0-02	S					X

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 VIOLATIONS REPORT FOR TOTAL NICKEL (ug/l) -

LIMITS IN EFFECT:

IJC > 25.00  
 O-EPA NORM > 25.00  
 O-EPA EX > 200.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICH DNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICH	DNR
78	181	925	2	1	0-03	S	48.000	X			X	
78	181	1005	2	1	0-04	S	57.000	X			X	
78	181	1100	2	1	0-05	S	29.000	X			X	
78	181	1140	2	1	0-08	S	26.000	X			X	
78	182	1037	2	2	0-14	S	36.000	X			X	
78	188	1110	2	1	0-16	S	35.000	X			X	
78	188	1130	2	1	0-21	S	100.000	X			X	
78	188	1320	2	1	0-23	S	43.000	X			X	
78	188	1426	2	1	0-24	S	140.000	X			X	
78	188	1426	2	1	0-24	S	71.000	X			X	
78	191	1222	2	1	0-29	S	61.000	X			X	
78	191	1125	2	1	0-30	S	100.000	X			X	
78	191	1300	2	1	0-31	S	58.000	X			X	
78	191	1340	2	1	0-32	S	40.000	X			X	
78	191	1423	2	1	0-33	S	35.000	X			X	
78	191	1445	2	1	0-34	S	38.000	X			X	
78	191	1525	2	1	0-35	S	32.000	X			X	
78	191	1000	2	1	0-37	S	51.000	X			X	
78	191	1000	2	1	0-37	S	29.000	X			X	
78	191	1120	2	1	0-39	S	32.000	X			X	
78	191	-98	2	1	0-41	S	52.000	X			X	
78	191	1250	2	1	0-42	S	29.000	X			X	
78	191	1330	2	1	0-43	S	57.000	X			X	
78	191	1705	2	1	0-44	S	41.000	X			X	
78	191	1635	2	1	0-45	S	31.000	X			X	
78	191	-98	2	1	0-46	S	84.000	X			X	
78	191	1530	2	1	0-47	S	78.000	X			X	
78	192	915	2	1	0-48	S	63.000	X			X	
78	191	1415	2	1	0-49	S	52.000	X			X	
78	191	1455	2	1	0-50	S	29.000	X			X	
78	178	1235	2	1	M-08	S	35.000	X			X	
78	252	915	3	1	0-37	S	29.000	X			X	
78	252	945	3	1	0-38	S	50.000	X			X	
78	252	1020	3	1	0-39	S	170.000	X			X	
78	252	1020	3	1	0-39	S	82.000	X			X	
78	252	1118	3	1	0-40	S	120.000	X			X	
78	252	1405	3	1	0-41	S	66.000	X			X	
78	252	1155	3	1	0-42	S	33.000	X			X	
78	252	1227	3	1	0-43	S	40.000	X			X	
78	252	1355	3	1	0-47	S	59.000	X			X	
78	252	1430	3	1	0-48	S	46.000	X			X	
78	252	1252	3	1	0-49	S	45.000	X			X	
78	252	1320	3	1	0-50	S	46.000	X			X	
78	237	1115	3	3	M-02	S	54.000	X			X	
78	235	1310	3	1	M-06	S	44.000	X			X	
78	237	1245	3	3	M-07	S	38.000	X			X	
78	237	1245	3	3	M-07	S	38.000	X			X	
78	235	1230	3	1	M-09	S	39.000	X			X	
78	235	1010	3	1	M-12	S	32.000	X			X	
78	235	1110	3	1	M-14	S	220.000	X			X	

PAGE 23- 3  
 VIOLATIONS REPORT FOR TOTAL NICKEL (ug/l) .

LIMITS IN EFFECT:

IJC > 25.00  
 O-EPA NORM > 25.00  
 O-EPA EX > 200.00

OBJECTIVES & STANDARDS  
 IJC EPANORM EPAEX MICHDNR

YEAR	DAY	TIME	CRUISE	RUN	STA	DEPTH CODE	VALUE	IJC	EPANORM	EPAEX	MICHDNR
78	235	1110	3	1	M-14	S	150.000	X			
78	235	1150	3	1	M-15	S	41.000	X			
78	237	1500	3	3	M-16	S	28.000	X			
78	237	1530	3	3	M-18	S	30.000	X			
78	237	1530	3	3	M-18	S	38.000	X			
78	235	1635	3	1	M-20	S	44.000	X			
78	235	1700	3	1	M-21	S	28.000	X			
78	235	1700	3	1	M-21	S	35.000	X			
78	238	1135	3	1	M-22	S	27.000	X			
78	238	1100	3	1	M-23	S	40.000	X			
78	238	1213	3	1	M-25	S	38.000	X			
78	238	1025	3	1	M-26	S	91.000	X			
78	238	930	3	1	M-27	S	41.000	X		X	
78	280	800	4	1	O-02	S	90.000	X		X	
78	280	1535	4	1	O-08	S	33.000	X		X	
78	280	1445	4	1	O-10	S	26.000	X		X	
78	280	1518	4	1	O-11	S	29.000	X		X	
78	280	1405	4	1	O-12	S	36.000	X		X	
78	284	1037	4	1	O-20	S	68.000	X		X	
78	284	1327	4	1	O-24	S	39.000	X		X	
78	284	1327	4	1	O-28	S	190.000	X		X	
78	284	1523	4	1	O-30	S	33.000	X		X	
78	288	1310	4	1	O-31	S	45.000	X		X	
78	288	1330	4	1	O-33	S	27.000	X		X	
78	288	1130	4	1	O-37	S	77.000	X		X	
78	288	1520	4	1	O-43	S	52.000	X		X	
78	288	1201	4	1	O-44	S	27.000	X		X	
78	288	922	4	1	M-02	S	26.000	X		X	
78	276	1030	4	1	M-11	S	26.000	X		X	
78	276	1420	4	1	M-12	S	94.000	X		X	
78	276	900	4	1	M-16	S	33.000	X		X	
78	276	1450	4	1	M-16	S	30.000	X		X	
78	276	1655	4	1	M-19	S	30.000	X		X	

SUMMARY:

131 SAMPLES HAD VIOLATIONS FOR IJC ( 35.40 PERCENT)  
 81 SAMPLES HAD VIOLATIONS FOR O-EPA NORM ( 21.89 PERCENT)  
 0 SAMPLES HAD VIOLATIONS FOR O-EPA EX ( 0.00 PERCENT)

131 SAMPLES HAD VIOLATIONS IN ALL ( 35.40 PERCENT)  
 370 SAMPLES PROCESSED