RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 07-28

CONTINUOUS DISSOLVED OXYGEN MONITORING

IN CHICAGO AREA WADEABLE STREAMS

DURING 2006

May 2007

Metropolitan Water Reclamation District of Greater Chicago
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CONTINUOUS DISSOLVED OXYGEN MONITORING IN CHICAGO AREA WADEABLE STREAMS DURING 2006

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ACKNOWLEDGMENT

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MONITORING STATIONS

Locations and Descriptions

The CDOM Program and the Ambient Water Quality Monitoring (AWQM) Program supply the District with water quality data throughout the year for both the wadeable streams and deep-draft waterways within its jurisdiction. All stations for both programs are shown in Figure 1. Descriptions of the wadeable CDOM stations are listed in Table 1.

Designated Uses

The IPCB has assigned water uses for specific water bodies within the state of Illinois. All waters in Illinois are designated for General Use, except those selected as Secondary Contact and Indigenous Aquatic Life Waters (Secondary Contact).

In the Chicago and Calumet River Systems, General Use Waters include the North Shore Channel from Lake Michigan to the North Side WRP, the deep-draft Chicago and Calumet Rivers, and the wadeable streams of the Chicago, Des Plaines, and Calumet River Systems.

Secondary Contact Waters include the North Shore Channel from the North Side WRP to the North Branch Chicago River, the North Branch Chicago River from the North Shore Channel to the Chicago River, the South Branch Chicago River, Bubbly Creek, the Chicago Sanitary and Ship Canal, the Grand Calumet River, the deep-draft portion of the Little Calumet River, the Calumet-Sag Channel, and the Des Plaines River from its confluence with the Chicago Sanitary and Ship Canal to the Interstate Highway 55 bridge southwest of Joliet.

Water Quality Standards

The IPCB has established water quality standards for DO in both General Use and Secondary Contact Waters. In General Use Waters, the DO shall not be less than 6.0 mg/L during 16 hours of any 24-hour period, nor less than 5.0 mg/L at any time. In Secondary Contact Waters, the DO shall not be less than 4.0 mg/L at any time, except in the Calumet-Sag Channel where the DO shall not be less than 3.0 mg/L at any time. For this report, we have selected the 5.0 mg/L DO standard when calculating percent compliance for General Use Waters.

MATERIALS AND METHODS

Water Quality Monitor

The continuous water quality monitors (monitor) used to collect these data were manufactured by YSI Incorporated (YSI) of Yellow Springs, Ohio. DO was measured hourly using the YSI Model 6920 or Model 6600 monitor. In order to protect and safeguard the monitors from marine navigation and vandalism, the monitors were deployed in the field in stainless steel pipes. Installation designs resulted in a fixed length of pipe at each location with multiple 2-inch circular openings on the submerged end to allow sufficient flow of water through the pipe. Each monitor housing was vertically mounted on the side of a bridge abutment with an access hatch on the top end to allow for the exchange of monitors.

Servicing the monitors followed a weekly schedule. Industrial Waste Division personnel retrieved each monitor from the field following seven days of continuous monitoring. Prior to retrieval, a water sample for DO analysis was collected next to the protective housing. An additional monitor, that had been previously calibrated and serviced in the laboratory, was then deployed to replace the retrieved monitor. The retrieved monitors were returned to the laboratory for data downloading, exterior cleaning, servicing, and calibration of the DO sensors. The moni-

After careful review of the DO data, weekly summary statistics (mean, minimum, maximum, and percent observations above DO standard), and individual line drawings for each monitoring station showing hourly DO concentrations were prepared.

Verification of Representative Data

During the spring, summer, and fall of 2006, cross-sectional DO surveys were conducted in the CWS and Des Plaines River System to determine if a fixed continuous monitoring location represented the DO concentration across the waterway. Verification was achieved by comparing the DO concentrations measured in grab samples at multiple fixed locations and depths across the waterway with the fixed monitor measurements. The results from the cross-sectional surveys clearly showed that the differences across the waterway were minimal and equivalent to the DO concentration measured by the monitor at the fixed locations.

RESULTS

The annual minimum, maximum, and mean DO concentrations measured at all 12 stations during 2006 are shown in Table 2.

TABLE 1: WADEABLE STREAM CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
	Chicago River System	
Central Park Avenue	North Branch Chicago River	0.8 mile above junction with North Shore Channel, water quality monitor on northeast side of Central Park Avenue bridge, 2 feet below water surface.
	Des Plaines River System	
Devon Avenue	Des Plaines River	0.7 mile above junction with Willow Creek, water quality monitor on northwest side of Devon Avenue bridge, 2 feet below water surface.
Irving Park Road	Des Plaines River	3.1 miles below junction with Willow Creek, water quality monitor on northeast side of Irving Park Road bridge, 2 feet below water surface.
Ogden Avenue	Des Plaines River	1.7 miles below junction with Salt Creek, 25.8 miles above junction with Chicago Sanitary and Ship Canal, water quality monitor on center of

TABLE 1 (Continued): WADEABLE STREAM CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
	Des Plaines River System (Continued)	
Busse Lake Dam	Salt Creek	0.1 mile above Egan WRP outfall, water quality monitor on bike path bridge support, downstream of Busse Woods South Dam, in center of creek, 2 feet below water surface.
J. F. Kennedy Boulevard	Salt Creek	0.8 mile below Egan WRP outfall, water quality monitor on southeast side of J. F. Kennedy Boulevard bridge, 2 feet below water surface.
Thorndale Avenue	Salt Creek	2.6 miles below Egan WRP outfall, water quality monitor on southeast side of Thorndale Avenue bridge, 2 feet below water surface.
Wolf Road	Salt Creek	8.0 miles above junction with Des Plaines River, water quality monitor on northwest side of Wolf Road bridge, 1 foot below water surface.
	Calumet River System	
Hohman Avenue	Grand Calumet River	3.1 miles above junction with Calumet River, water quality monitor on southeast side of Hohman Avenue bridge, 1 foot below water surface.

TABLE 1 (Continued): WADEABLE STREAM CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
	Calumet River System (Continued)	
Wentworth Avenue	Little Calumet River	12.4 miles above junction with Calumet-Sag Channel, water quality monitor on center of east side of Wentworth Avenue bridge, 2 feet below water surface.
Ashland Avenue	Little Calumet River	0.5 mile above junction with Calumet-Sag Channel, water quality monitor attached to east side Ashland Avenue bridge, 2 feet below water surface.

TABLE 2: MINIMUM, MAXIMUM, AND MEAN HOURLY DISSOLVED OXYGEN CONCENTRATIONS[1]

Monitoring Station	Waterway	DO Concentration (mg/L)		
		Minimum	Maximum	Mean
	Chicago River System			
Central Park Avenue	North Branch Chicago River	0.1	18.0	8.8
	Des Plaines River System			

TABLE 3: NUMBER AND PERCENT OF DISSOLVED OXYGEN VALUES NOT MEETING ACCEPTANCE CRITERIA[1]

Monitoring Station	Waterway	Number of DO Values Rejected	Percent of DO Values Rejected
	Chicago River System		
Central Park Avenue	North Branch Chicago River	169	2
	Des Plaines River System		
Devon Avenue	Des Plaines River	339	4
Irving Park Road	Des Plaines River	186	2
Ogden Avenue	Des Plaines River	1	0
Material Service Road	Des Plaines River	923	11
Busse Lake Dam	Salt Creek	237	3
J. F. Kennedy Boulevard	Salt Creek	0	0
Thorndale Avenue	Salt Creek	1,180	14
Wolf Road	Salt Creek	193	2
	Calumet River System		
Hohman Avenue	Grand Calumet River	5,462	62
Wentworth Avenue	Little Calumet River	252	3
Ashland Avenue	Little Calumet River	361	4

[1]Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor. DO values were rejected based on quality control check and/or operational problems with monitor.

TABLE 4: NUMBER AND PERCENT OF DISSOLVED OXYGEN VALUES MEASURED ABOVE THE ILLINOIS POLLUTION CONTROL BOARD'S WATER QUALITY STANDARD[1]

Monitoring Station	Waterway	IPCB DO Standard	Number of DO Values	Number Above Standard	Percent Above Standard
	Chicago River System				

TABLE 5: PERCENT OF DISSOLVED OXYGEN VALUES IN SELECTED RANGES

Monitoring Station	Waterway	Percent of DO Values in Range (mg/L)					
		0-<1	1-<2	2-<3	3-<4	4-<5	≥5
	Chicago River System						
Central Park Avenue	North Branch Chicago River	<1	<1	<1	1	7	92
	Des Plaines River System						
Devon Avenue	Des Plaines River	<1	<1	2	4	7	87
Irving Park Road	Des Plaines River	0	0	1	4	6	89
Ogden Avenue	Des Plaines River	0	0	0	0	<1	>99
Material Service Road	Des Plaines River	0	0	0	0	1	99
Busse Lake Dam	Salt Creek	<1	<1	<1	<1	<1	98
J. F. Kennedy Boulevard	Salt Creek	0	0	0	0	0	100
Thorndale Avenue	Salt Creek	0	0	0	<1	1	99
Wolf Road	Salt Creek	0	0	0	<1	4	96
	Calumet River System						
Hohman Avenue	Grand Calumet River	24	18	15	16	13	13
Wentworth Avenue	Little Calumet River	<1	<1	3	8	12	77
Ashland Avenue	Little Calumet River	0	0	<1	7	14	79

FIGURE 1: CONTINUOUS DISSOLVED OXYGEN MONITORING AND AMBIENT WATER QUALITY MONITORING SAMPLE STATIONS

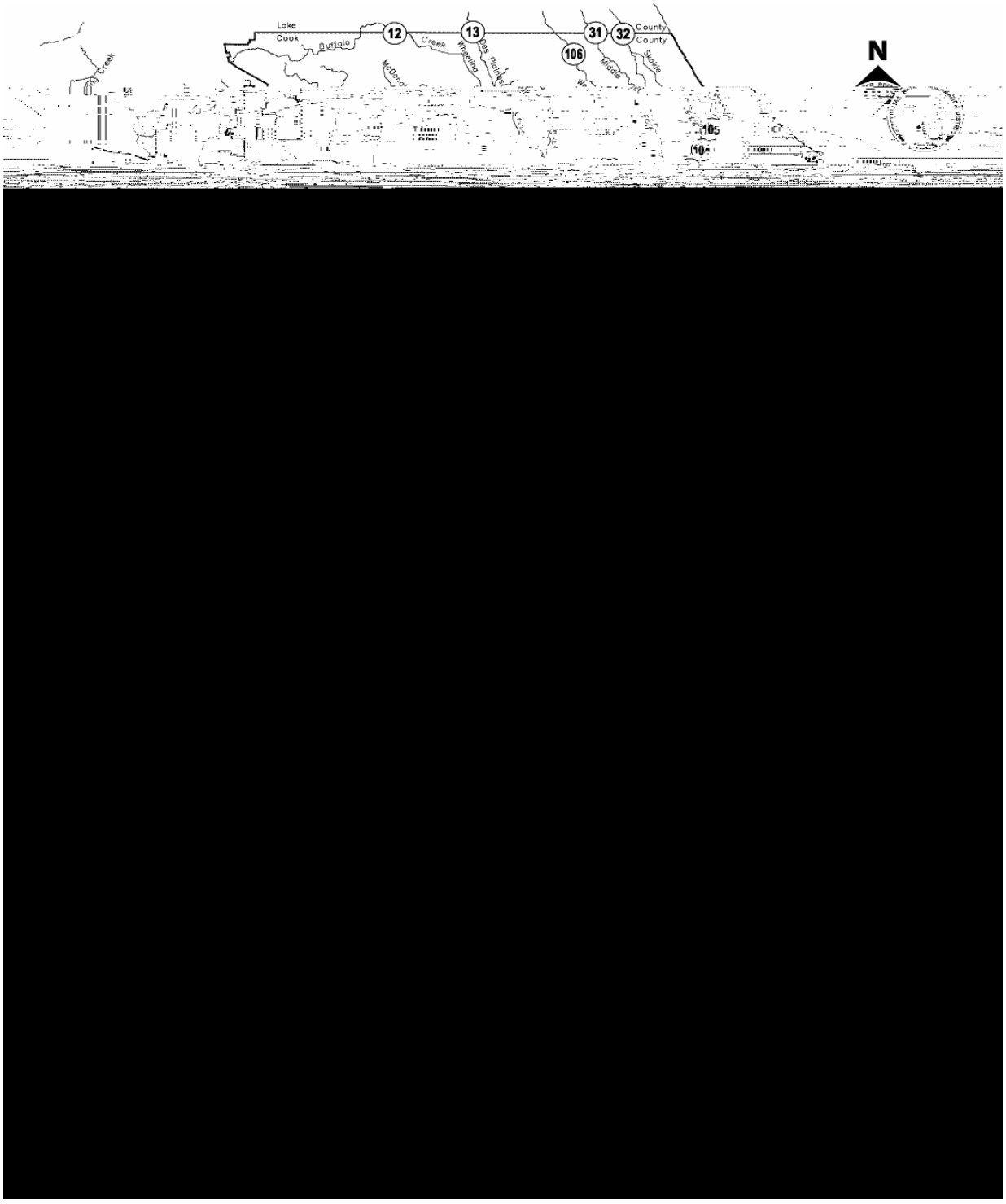

FIGURE 2: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CENTRAL PARK AVENUE ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006

FIGURE 3: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT DEVON AVENUE ON THE DES PLAINES RIVER FROM

FIGURE 4: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT IRVING PARK ROAD ON THE DES PLAINES RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006

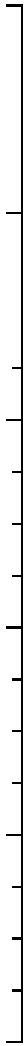

FIGURE 6: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT MATERIAL SERVICE ROAD ON THE DES PLAINES RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006

FIGURE 7: DISSOLVED

FIGURE 8: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT J. F. KENNEDY BOULEVARD ON SALT CREEK FROM JANUARY 2006 THROUGH DECEMBER 2006

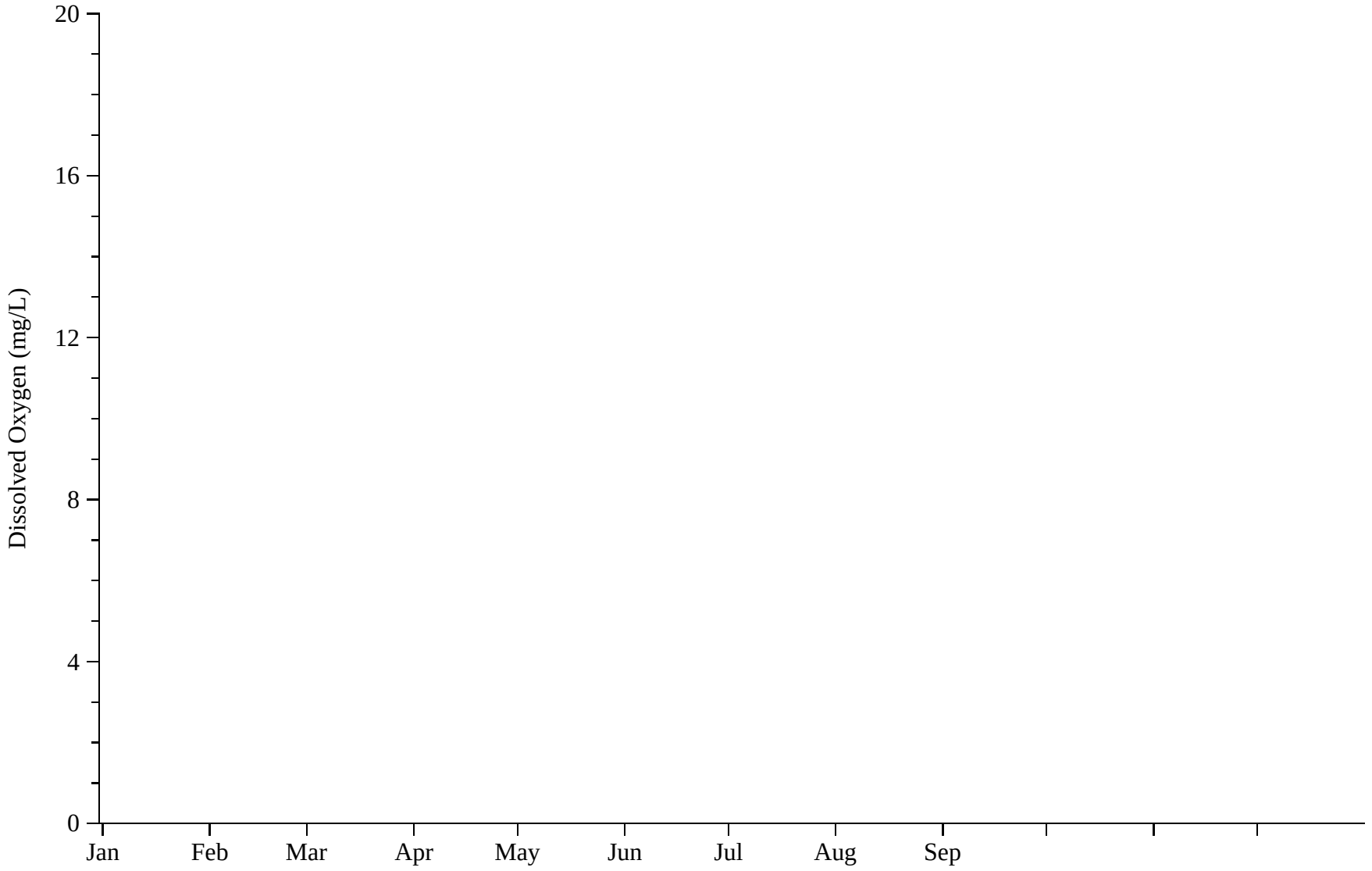

FIGURE 9: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT THORNDALE AVENUE ON SALT CREEK FROM JANUARY 2006 THROUGH DECEMBER 2006

FIGURE 10: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT WOLF ROAD
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FIGURE 11: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT HOHMAN AVENUE ON THE GRAND CALUMET RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006

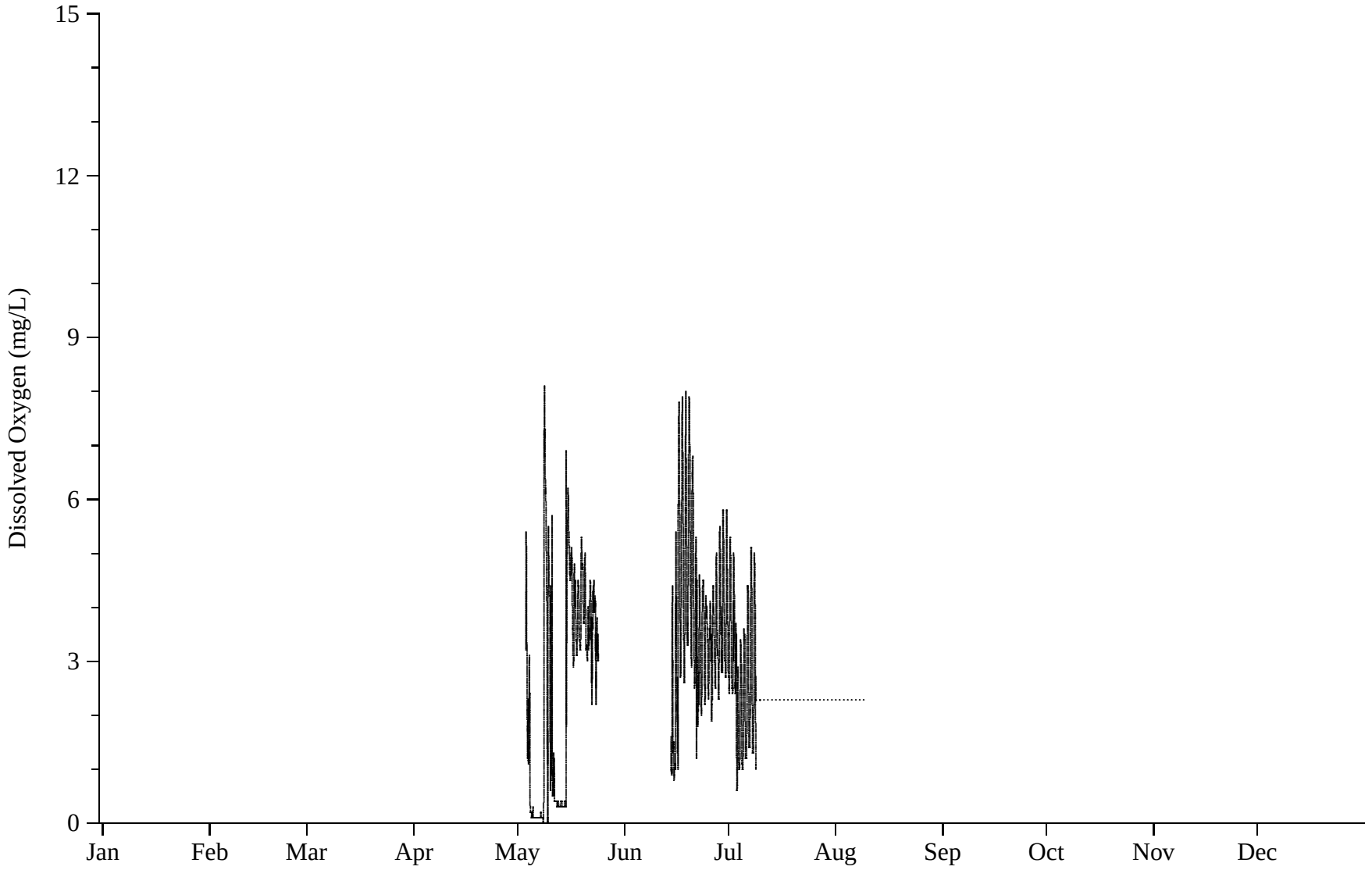
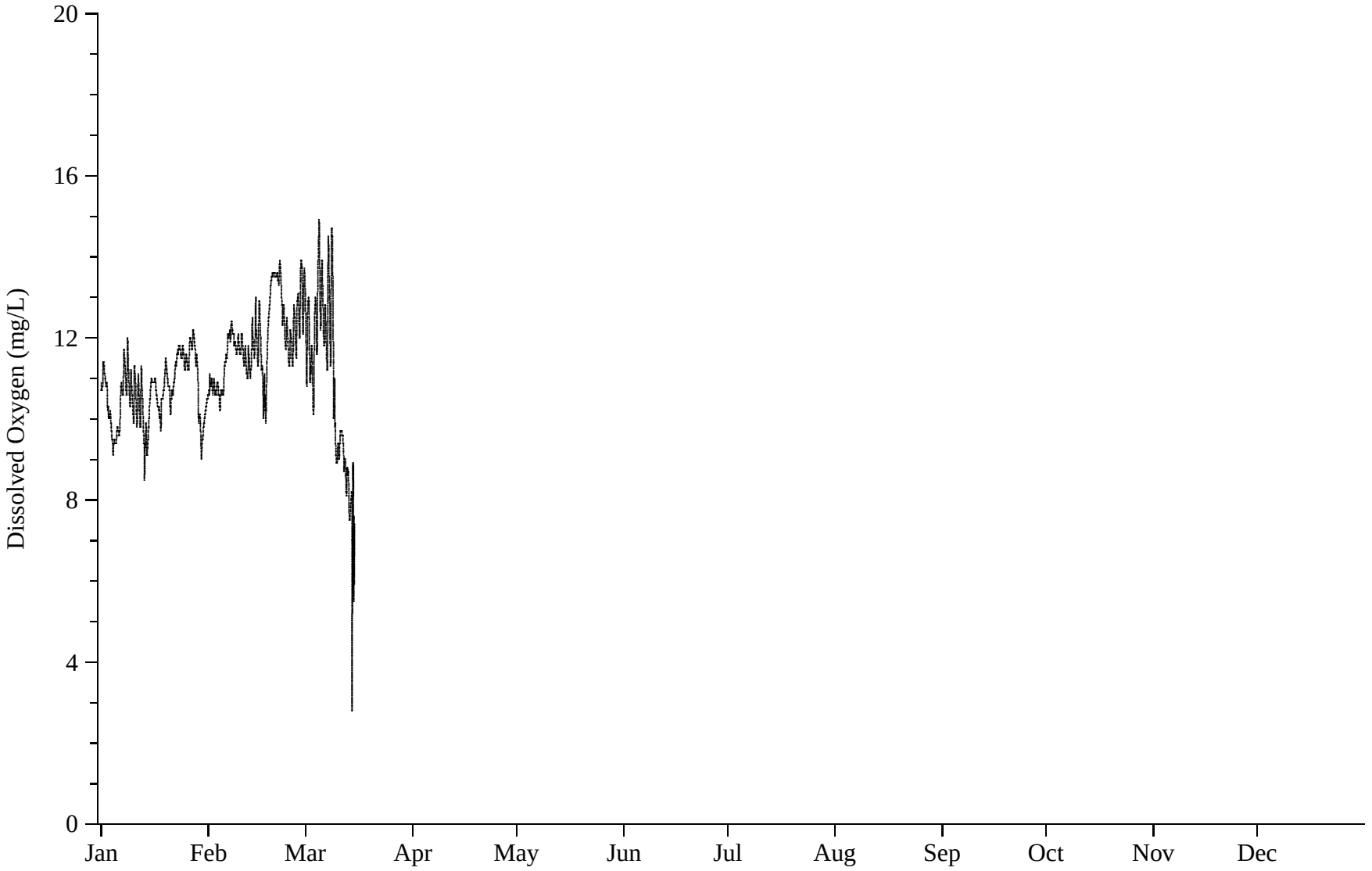


FIGURE 12: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT WENTWORTH AVENUE ON THE LITTLE CALUMET RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006

FIGURE 13: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ASHLAND AVENUE ON THE LITTLE CALUMET RIVER FROM JANUARY 2006 THROUGH DECEMBER 2006



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APPENDIX A

WEEKLY DO SUMMARY STATISTICS AT ALL WADEABLE STREAM MONITORING STATIONS DURING 2006

TABLE A-1: WEEKLY DO SUMMARY STATISTICS AT CENTRAL PARK AVENUE ON THE NORTH BRANCH CHICAGO RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 01/01/06	24	11.3	12.3	11.9	100
01/02/06 - 01/08/06	168	10.6	12.8	11.7	100
01/09/06 - 01/15/06	60	11.9	13.2	12.3	100
01/16/06 - 01/22/06	108	11.7	13.4	12.5	100
01/23/06 - 01/29/06	168	10.3	14.7	12.8	100
01/30/06 - 02/05/06	168	10.3	14.1	12.2	100
02/06/06 - 02/12/06	168	13.1	15.4	14.1	100
02/13/06 - 02/19/06	168	11.9	15.5	13.9	100
02/20/06 - 02/26/06	168	13.4	15.7	14.5	100
02/27/06 - 03/05/06	168	13.1	18.0	15.0	100
03/06/06 - 03/12/06	168	0.1	16.6	9.5	67
03/13/06 - 03/19/06	168	0.1	11.8	10.5	96
03/20/06 - 03/26/06	168	11.1	13.3	12.0	100
03/27/06 - 04/02/06	168	9.4	14.8	11.9	100
04/03/06 - 04/09/06	167	8.9	14.0	10.7	100
04/10/06 - 04/16/06	168	8.0	14.7	11.0	100
04/17/06 - 04/23/06	168	6.4	11.6	8.6	100
04/24/06 - 04/30/06	168	6.3	11.6	8.5	100
05/01/06 - 05/07/06	168	6.6	9.7	7.8	100
05/08/06 - 05/14/06	168	4.9	8.8	7.0	99
05/15/06 - 05/21/06	168	6.3	8.3	7.3	100
05/22/06 - 05/28/06	168	3.0	7.6	5.6	61
05/29/06 - 06/04/06	168	2.0	6.5	4.8	46
06/05/06 - 06/11/06	168	4.8	7.6	5.8	96
06/12/06 - 06/18/06	168	4.5	7.2	6.1	86
06/19/06 - 06/25/06	168	4.5	6.6	5.6	83
06/26/06 - 07/02/06	168	5.0	10.5	6.7	99
07/03/06 - 07/09/06	167	3.4	6.9	5.3	59
07/10/06 - 07/16/06	168	2.2	6.2	5.0	51
07/17/06 - 07/23/06	168	1.6	5.9	4.7	29
07/24/06 - 07/30/06	168	4.5	6.2	5.3	79
07/31/06 - 08/06/06	168	0.9	5.8	4.7	36
08/07/06 - 08/13/06	168	4.7	6.4	5.4	85

TABLE A-1 (Continued): WEEKLY DO SUMMARY STATISTICS AT CENTRAL PARK AVENUE ON THE NORTH BRANCH CHICAGO RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	168	4.2	6.3	5.7	90
08/21/06 - 08/27/06	168	5.2	6.8	6.0	100
08/28/06 - 09/03/06	168	4.9	7.1	6.3	99
09/04/06 - 09/10/06	168	5.8	7.2	6.6	100
09/11/06 - 09/17/06	168	5.9	7.9	6.9	100
09/18/06 - 09/24/06	168	5.2	8.3	7.0	100
09/25/06 - 10/01/06	168	6.7	8.6	7.7	100
10/02/06 - 10/08/06	168	5.8	8.2	7.0	100
10/09/06 - 10/15/06	168	5.7	9.4	8.0	100
10/16/06 - 10/22/06	168	6.4	9.1	7.9	100
10/23/06 - 10/29/06	168	7.5	9.9	8.6	100
10/30/06 - 11/05/06	169	7.5	10.9	9.4	100
11/06/06 - 11/12/06	168	7.3	9.6	8.3	100
11/13/06 - 11/19/06	168	8.9	11.2	10.1	100
11/20/06 - 11/26/06	168	9.8	12.6	11.2	100
11/27/06 - 12/03/06	168	7.5	12.6	10.1	100
12/04/06 - 12/10/06	168	11.8	13.4	12.7	100
12/11/06 - 12/17/06	168	10.6	12.2	11.1	100
12/18/06 - 12/24/06	168	10.2	12.4	11.2	100
12/25/06 - 12/31/06	168	10.4	12.0	11.5	100

TABLE A-2 (Continued): WEEKLY DO SUMMARY STATISTICS AT DEVON AVENUE ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	168	4.3	5.3	4.7	17
08/21/06 - 08/27/06	59	4.7	5.4	5.0	47
08/28/06 - 09/03/06	107	5.7	6.2	5.9	100
09/04/06 - 09/10/06	168	5.4	6.2	5.9	100
09/11/06 - 09/17/06	168	5.7	7.1	6.7	100
09/18/06 - 09/24/06	61	6.1	7.7	6.8	100
09/25/06 - 10/01/06	110	6.9	7.9	7.5	100
10/02/06 - 10/08/06	168	5.8	8.1	7.1	100
10/09/06 - 10/15/06	168	6.8	9.1	8.1	100
10/16/06 - 10/22/06	168	7.7	9.2	8.5	100
10/23/06 - 10/29/06	169	8.8	10.9	10.0	100
10/30/06 - 11/05/06	169	9.5	12.4	10.8	100
11/06/06 - 11/12/06	168	9.3	11.7	10.2	100
11/13/06 - 11/19/06	168	10.1	11.4	10.7	100
11/20/06 - 11/26/06	168	10.6	12.0	11.4	100
11/27/06 - 12/03/06	168	8.2	12.9	10.3	100
12/04/06 - 12/10/06	168	12.4	13.5	13.1	100
12/11/06 - 12/17/06	168	11.3	12.9	11.7	100
12/18/06 - 12/24/06	168	10.8	13.1	11.8	100
12/25/06 - 12/31/06	168	11.4	12.3	11.9	100

TABLE A-3: WEEKLY DO SUMMARY STATISTICS AT IRVING PARK ROAD ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 01/01/06	24	10.1	11.1	10.6	100
01/02/06 - 01/08/06	168	9.6	12.9	11.3	100
01/09/06 - 01/15/06	168	10.6	12.9	11.8	100
01/16/06 - 01/22/06	168	11.1	134R642045 TD 8		100
01/23/06 - 01/29/06	168	10.0	14 8	100	
01/30/06 - 02/05/06	167	10.0	13.0	11.9	100
02/06/06 - 02/12/06	168	12.3	13.7	13.2	100
02/13/06 - 02/19/06	168	11 8	14 0	12.9	100
02/20/06 - 02/26/06	168	12.7	14 R642045 T3.6		100
02/27/06 - 03/05/06	168	11.8	15.7	13.3	100
03/06/06 - 03/12/06	168	9.9	15.2	11.8	100
03/13/06 - 03/19/06	168	9.7	11.4	10.6	100
03/20/06 - 03/26/06	168	11.1	12.2	11.7	100
03/27/06 - 04/02/06	168	8.9	11.9	10.6	100
04/03/06 - 04/09/06	167	8.4	11.0	9 8	100
04/10/06 - 04/16/06	168	7.9	10.7	9.2	100
04/17/06 - 04/23/06	168	7.4	10.1	8.8	100
04/24/06 - 04/30/06	168	4.6	10.1	8.1	99
05/01/06 - 05/07/06	168	5.7	10.0	8.0	100
05/08/06 - 05/14/06	168	7.0	10.3	8.8	100
05/15/06 - 05/21/06	168	8.0	10.0	9 0	100
05/22/06 - 05/28/06	168	5.9	9 8	7.4	100
05/29/06 - 06/04/06	168	3.9	6 8	5.3	68
06/05/06 - 06/11/06	168	5.1	7 8	5.9	100
06/12/06 - 06/18/06	168	5.3	7 3	6.3	100
06/19/06 - 06/25/06	167	4.4	7 7	5.7	82
06/26/06 - 07/02/06	167	5.1	7 1	6.1	100
07/03/06 - 07/09/06	168	3.3	6 0	4.7	46
07/10/06 - 07/16/06	167	2.7	11.3	4.7	33
07/17/06 - 07/23/06	168	2.7	5.2	3.9	2
07/24/06 - 07/30/06	168	2.3	5.2	3.7	2
07/31/06 - 08/06/06	168	1.9	4.7	3.6	0
08/07/06 - 08/13/06	168	3.7	5.9	4.7	28

TABLE A-3 (Continued): WEEKLY DO SUMMARY STATISTICS AT IRVING PARK ROAD ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	60	4.6	6.2	5.2	60
08/21/06 - 08/27/06	109	4.8	5.9	5.1	68
08/28/06 - 09/03/06	168	4.8	6.6	5.8	93
09/04/06 - 09/10/06	168	5.5	6.5	6.0	100
09/11/06 - 09/17/06	168	5.8	7.4	6.6	100
09/18/06 - 09/24/06	168	5.8	8.1	7.1	100
09/25/06 - 10/01/06	168	6.7	9.3	7.6	100
10/02/06 - 10/08/06	167	5.8	7.9	7.0	100
10/09/06 - 10/15/06	168	7.1	9.7	8.3	100
10/16/06 - 10/22/06	168	7.6	9.5	8.4	100
10/23/06 - 10/29/06	168	8.4	10.1	9.3	100
10/30/06 - 11/05/06	157	8.9	12.2	10.7	100
11/06/06 - 11/12/06	167	8.8	11.6	9.8	100
11/13/06 - 11/19/06	168	9.6	11.6	10.6	100
11/20/06 - 11/26/06	168	10.4	12.0	11.4	100
11/27/06 - 12/03/06	168	8.1	13.0	10.3	100
12/04/06 - 12/10/06	168	11.9	13.9	12.9	100
12/11/06 - 12/17/06	168	10.4	12.6	11.4	100
12/18/06 - 12/24/06	167	10.2	12.6	11.3	100
12/25/06 - 12/31/06	168	10.7	11.7	11.3	100

TABLE A-4: WEEKLY DO SUMMARY STATISTICS AT OGDEN AVENUE
ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 01/01/06	24	12.4	12.9	12.7	100
01/02/06 - 01/08/06	168	12.0	13.4	12.6	100
01/09/06 - 01/15/06	168	12.5	14.3	13.1	100
01/16/06 - 01/22/06	168	12.4	14.4	13.2	100
01/23/06 - 01/29/06	168	11.0	14.6	13.2	100
01/30/06 - 02/05/06	168	11.0	13.3	12.4	100
02/06/06 - 02/12/06	168	13.3	15.1	14.3	100
02/13/06 - 02/19/06	168	12.1	15.4	13.9	100
02/20/06 - 02/26/06	168	13.3	14.8	14.0	100
02/27/06 - 03/05/06	168	12.6	15.1	13.6	100
03/06/06 - 03/12/06	168	10.3	14.1	11.8	100
03/13/06 - 03/19/06	168	10.4	12.6	11.7	100
03/20/06 - 03/26/06	168	12.2	13.0	12.5	100
03/27/06 - 04/02/06	168	9.6	12.5	11.0	100
04/03/06 - 04/09/06	167	9.1	11.5	10.4	100
04/10/06 - 04/16/06	168	8.6	11.4	9.9	100
04/17/06 - 04/23/06	168	8.3	10.5	9.2	100
04/24/06 - 04/30/06	168	8.0	10.8	9.3	100
05/01/06 - 05/07/06	168	7.6	10.1	8.9	100
05/08/06 - 05/14/06	168	8.4	10.7	9.3	100
05/15/06 - 05/21/06	168	9.1	10.6	9.7	100
05/22/06 - 05/28/06	168	7.1	10.1	8.4	100
05/29/06 - 06/04/06	168	5.2	7.9	6.9	100
06/05/06 - 06/11/06	168	6.5	8.2	7.5	100
06/12/06 - 06/18/06	168	6.3	8.5	7.5	100
06/19/06 - 06/25/06	168	6.3	8.7	7.2	100
06/26/06 - 07/02/06	168	7.0	9.2	7.7	100
07/03/06 - 07/09/06	168	6.1	8.1	7.0	100
07/10/06 - 07/16/06	168	5.9	9.6	6.9	100
07/17/06 - 07/23/06	168	4.8	8.3	6.1	99
07/24/06 - 07/30/06	168	5.4	7.4	6.3	100
07/31/06 - 08/06/06	168	4.2	6.9	5.5	77
08/07/06 - 08/13/06	168	5.8	7.7	6.5	100

TABLE A-4 (Continued): WEEKLY DO SUMMARY STATISTICS AT OGDEN AVENUE ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	

TABLE A-5: WEEKLY DO SUMMARY STATISTICS AT MATERIAL SERVICE ROAD ON THE DES PLAINES RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/02/06 - 01/08/06	85	11.4	16.3	13.2	100
01/09/06 - 01/15/06	168	11.4	18.2	13.7	100
01/16/06 - 01/22/06	82	11.2	17.6	13.1	100
01/23/06 - 01/29/06	85	11.6	19.5	15.1	100
01/30/06 - 02/05/06	168	10.5	13.9	12.2	100

TABLE A-5 (Continued): WEEKLY DO SUMMARY STATISTICS AT

TABLE A-6: WEEKLY DO SUMMARY STATISTICS AT BUSSE LAKE DAM
ON SALT CREEK DURING 2006

Percent DO

TABLE A-6 (Continued): WEEKLY DO SUMMARY STATISTICS AT BUSSE LAKE DAM ON SALT CREEK DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	168	0.3	8.4	3.9	40
08/21/06 - 08/27/06	58	3.0	8.7	5.9	59
08/28/06 - 09/03/06	108	7.0	9.8	7.9	100
09/04/06 - 09/10/06	168	6.2	9.9	8.1	100
09/11/06 - 09/17/06	168	6.0	8.9	7.9	100
09/18/06 - 09/24/06	168	7.9	9.8	8.6	100
09/25/06 - 10/01/06	168	8.1	9.6	8.8	100
10/02/06 - 10/08/06	168	8.1	9.2	8.7	100
10/09/06 - 10/15/06	168	7.7	10.4	9.3	100
10/16/06 - 10/22/06	168	10.2	11.5	10.8	100
10/23/06 - 10/29/06	143	11.4	12.8	12.1	100
10/30/06 - 11/05/06	130	11.6	12.7	12.1	100
11/06/06 - 11/12/06	168	11.6	12.3	12.0	100
11/13/06 - 11/19/06	168	11.7	13.3	12.6	100
11/20/06 - 11/26/06	168	12.0	13.5	12.9	100
11/27/06 - 12/03/06	168	11.2	13.3	12.2	100
12/04/06 - 12/10/06	168	13.3	14.3	13.9	100
12/11/06 - 12/17/06	168	13.1	14.7	13.6	100
12/18/06 - 12/24/06	168	12.3	13.6	13.0	100
12/25/06 - 12/31/06	168	12.1	12.7	12.5	100

TABLE A-7: WEEKLY DO SUMMARY STATISTICS AT J. F. KENNEDY BOULEVARD ON SALT CREEK DURING 2006

Percent DO

TABLE A-7 (Continued): WEEKLY DO SUMMARY STATISTICS AT J. F. KENNEDY BOULEVARD ON SALT CREEK DURING 2006

TABLE A-8: WEEKLY DO SUMMARY STATISTICS AT THORNDALE AVENUE ON SALT CREEK DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 01/01/06	24	10.1	11.9	10.7	100
01/02/06 - 01/08/06	168	9.7	12.5	11.0	100
01/09/06 - 01/15/06	168	9.2	12.9	10.6	100
01/16/06 - 01/22/06	168	9.6	13.9	10.9	100
01/23/06 - 01/29/06	168	9.6	14.0	11.1	100
01/30/06 - 02/05/06	168	10.4	13.7	11.7	100
02/06/06 - 02/12/06	168	9.7	15.1	11.9	100
02/13/06 - 02/19/06	168	9.2	15.3	12.0	100
02/20/06 - 02/26/06	168	9.4	14.5	11.5	100
02/27/06 - 03/05/06	168	8.7	16.0	10.9	100
03/06/06 - 03/12/06	57	9.4	15.8	11.3	100
03/13/06 - 03/19/06	110	10.1	12.3	11.2	100
03/20/06 - 03/26/06	168	9.7	15.9	11.4	100
03/27/06 - 04/02/06	168	8.1	15.9	10.6	100
04/03/06 - 04/09/06	167	8.0	13.1	10.2	100
04/10/06 - 04/16/06	168	6.8	13.6	9.5	100
04/17/06 - 04/23/06	168	6.9	12.7	9.4	100
04/24/06 - 04/30/06	168	5.1	13.1	8.2	100
05/01/06 - 05/07/06	168	7.1	11.7	8.9	100
05/08/06 - 05/14/06	168	6.2	10.8	8.3	100
05/15/06	16894(18.TV/ /F154(100)]TJ 0 -1.22)E389 8E17/06 - 015116894(18.TV/ /F154(100)]TJ 0 -				

TABLE A-8 (Continued): WEEKLY DO SUMMARY STATISTICS AT THORNDALE AVENUE ON SALT CREEK DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	168	5.2	10.2	7.1	100
08/21/06 - 08/27/06	168	5.4	10.6	7.1	100
08/28/06 - 09/03/06	168	5.7	9.4	7.0	100
09/04/06 - 09/10/06	168	5.3	10.6	7.3	100
09/11/06 - 09/17/06	168	6.2	9.5	7.4	100
09/18/06 - 09/24/06	168	6.0	10.6	7.7	100
09/25/06 - 10/01/06	58	7.1	8.8	7.9	100
10/02/06 - 10/08/06			NO DATA		
10/09/06 - 10/15/06			NO DATA		
10/16/06 - 10/22/06			NO DATA		
10/23/06 - 10/29/06			NO DATA		
10/30/06 - 11/05/06			NO DATA		
11/06/06 - 11/12/06	110	7.6	10.9	9.3	100
11/13/06 - 11/19/06	168	9.0	11.7	9.9	100
11/20/06 - 11/26/06	168	7.9	12.3	9.5	100
11/27/06 - 12/03/06	168	7.6	13.4	10.6	100
12/04/06 - 12/10/06	168	10.3	13.4	11.9	100
12/11/06 - 12/17/06	168	10.2	12.9	11.6	100
12/18/06 - 12/24/06	168	9.9	13.2	11.4	100
12/25/06 - 12/31/06	168	10.2	11.8	11.1	100

TABLE A-9: WEEKLY DO SUMMARY STATISTICS AT WOLF ROAD
ON SALT CREEK DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 01/01/06	24	12.3	13.0	12.5	100
01/02/06 - 01/08/06	168	11.2	12.4	11.8	100
01/09/06 - 01/15/06	168	10.8	12.7	11.5	100
01/16/06 - 01/22/06	168	11.2	13.0	11.9	100
01/23/06 - 01/29/06	168	10.4	13.9	12.1	100
01/30/06 - 02/05/06	168	10.6	13.0	11.8	100
02/06/06 - 02/12/06	168	11.7	14.2	12.8	100
02/13/06 - 02/19/06	168	11.4	14.7	12.8	100
02/20/06 - 02/26/06	168	11.6	15.3	13.0	100
02/27/06 - 03/05/06	168	10.6	16.1	12.5	100
03/06/06 - 03/12/06	168	9.7	15.6	10.9	100
03/13/06 - 03/19/06	168	9.7	12.6	11.0	100

TABLE A-9 (Continued): WEEKLY DO SUMMARY STATISTICS AT WOLF ROAD ON SALT CREEK DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/14/06 - 08/20/06	168	5.0	8.8	6.3	100
08/21/06 - 08/27/06	168	5.4	8.6	6.6	100
08/28/06 - 09/03/06	168	6.0	8.7	7.0	100
09/04/06 - 09/10/06	167	5.9	8.4	6.9	100
09/11/06 - 09/17/06	168	6.5	8.2	7.4	100
09/18/06 - 09/24/06	169	6.4	9.3	7.6	100
09/25/06 - 10/01/06	168	7.6	9.2	8.2	100
10/02/06 - 10/08/06	168	6.1	8.9	7.9	100
10/09/06 - 10/15/06	168	7.8	10.2	8.9	100
10/16/06 - 10/22/06	168	8.2	10.0	9.1	100
10/23/06 - 10/29/06	168	8.9	10.7	9.7	100
10/30/06 - 11/05/06	169	8.7	11.8	10.2	100
11/06/06 - 11/12/06	168	8.3	10.8	9.4	100
11/13/06 - 11/19/06	168	9.8	10.9	10.3	100
11/20/06 - 11/26/06	168	8.8	11.5	10.4	100
11/27/06 - 12/03/06	168	7.8	12.5	9.9	100
12/04/06 - 12/10/06	167	12.1	14.4	13.1	100
12/11/06 - 12/17/06	168	10.7	12.6	11.6	100
12/18/06 - 12/24/06	168	10.4	12.3	11.3	100
12/25/06 - 12/31/06	168	10.6	12.3	11.6	100

TABLE A-10: WEEKLY DO SUMMARY STATISTICS AT HOHMAN AVENUE ON THE GRAND CALUMET RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
01/01/06 - 04/30/06			NO DATA		
05/01/06 - 05/07/06	109	0.1	5.4	0.8	2
05/08/06 - 05/14/06	168	0.0	8.1	1.6	11
05/15/06 - 05/21/06	168	0.3	6.9	4.1	14
05/22/06 - 05/28/06	59	2.2	4.5	3.6	0
05/29/06 - 06/04/06			NO DATA		
06/05/06 - 06/11/06	109	1.2	9.0	4.1	37
06/12/06 - 06/18/06	168	0.8	8.0	3.1	23
06/19/06 - 06/25/06	168	1.2	7.9	3.9	17
06/26/06 - 07/02/06	168	1.9	5.8	3.6	12
07/03/06 - 07/09/06	168	0.6	5.2	2.5	3
07/10/06 - 07/16/06	168	0.0	6.9	2.9	15
07/17/06 - 07/23/06	59	1.0	6.1	2.6	8
07/24/06 - 07/30/06	109	0.0	10.0	1.5	14
07/31/06 - 08/06/06	58	0.2	3.5	0.9	0
08/07/06 - 08/13/06	109	0.0	5.8	1.0	4
08/14/06 - 08/20/06	58	0.2	5.9	1.4	7
08/21/06 - 08/27/06			NO DATA		
08/28/06 - 09/03/06	109	0.6	6.2	1.9	6
09/04/06 - 09/10/06	59	0.5	6.5	1.5	10
09/11/06 - 09/17/06			NO DATA		
09/18/06 - 09/24/06	109	0.2	9.3	3.2	27
09/25/06 - 10/01/06	168	0.2	10.9	2.6	18
10/02/06 - 10/08/06	168	0.1	6.6	1.9	1
10/09/06 - 10/15/06	167	0.1	5.8	3.1	8
10/16/06 - 10/22/06	168	0.0	8.0	2.1	2
10/23/06 - 10/29/06	59	0.7	5.9	2.6	10
10/30/06 - 11/05/06			NO DATA		
11/06/06 - 11/12/06			NO DATA		
11/13/06 - 11/19/06			NO DATA		
11/20/06 - 11/26/06			NO DATA		
11/27/06 - 12/03/06			NO DATA		
12/04/06 - 12/10/06			NO DATA		
12/11/06 - 12/17/06	109	0.7	7.6	4.5	37

TABLE A-10 (Continued): WEEKLY DO SUMMARY STATISTICS AT HOHMAN AVENUE ON THE GRAND CALUMET RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
12/18/06 - 12/24/06	168	0.3	8.4	3.9	32
12/25/06 - 12/31/06	168	0.7	6.5	3.0	8

TABLE A-11: WEEKLY DO SUMMARY STATISTICS AT WENTWORTH AVENUE ON THE LITTLE CALUMET RIVER DURING 2006

TABLE A-11 (Continued): WEEKLY DO SUMMARY STATISTICS AT WENTWORTH AVENUE ON THE LITTLE CALUMET RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values Above IPCB Standard
		Minimum	Maximum	Mean	
08/21/06 - 08/27/06	168	3.4	5.4	4.3	5
08/28/06 - 09/03/06	168	3.3	5.8	5.0	68
09/04/06 - 09/10/06	168	4.0	7.2	5.3	85
09/11/06 - 09/17/06	168	4.7	7.5	5.9	97
09/18/06 - 09/24/06	168	4.8	7.1	6.0	89
09/25/06 - 10/01/06	168	6.0	7.6	6.7	100
10/02/06 - 10/08/06	168	4.3	8.0	6.6	98
10/09/06 - 10/15/06	168	5.4	8.6	7.3	100
10/16/06 - 10/22/06	168	6.6	8.6	7.8	100
10/23/06 - 10/29/06	169	7.3	9.5	8.5	100
10/30/06 - 11/05/06	169	6.1	9.5	8.2	100
11/06/06 - 11/12/06	168	6.1	8.2	6.9	100
11/13/06 - 11/19/06	168	7.7	9.6	8.8	100
11/20/06 - 11/26/06	168	8.4	10.3	9.7	100
11/27/06 - 12/03/06	168	6.1	13.1	9.7	100
12/04/06 - 12/10/06	168	11.4	13.5	12.6	100
12/11/06 - 12/17/06	168	9.3	11.6	10.9	100
12/18/06 - 12/24/06	168	9.5	11.1	10.3	100
12/25/06 - 12/31/06	168	8.3	10.9	10.0	100

TABLE A-12 (Continued): WEEKLY DO SUMMARY STATISTICS AT ASHLAND AVENUE ON THE LITTLE CALUMET RIVER DURING 2006

Monitoring Dates	Number of DO Values	DO Concentration (mg/L) Mini121(alu1766(MinNum)(8.n)Tf 1158[5ent)-240(DO)]TJ -28.nVal	Percent DO Values Above Dut