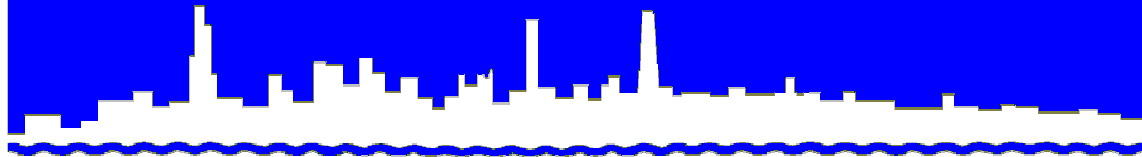


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 10-39

***CONTINUOUS DISSOLVED OXYGEN MONITORING
IN THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM
DURING 2009***

August 2010

Metropolitan Water Reclamation District of Greater Chicago
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**CONTINUOUS DISSOLVED OXYGEN MONITORING
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DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

INTRODUCTION

The Chicago Area Waterway System (CAWS) consists of 78 miles of canals, which serve the Chicago area for two principal purposes, the drainage of urban storm water runoff and treated municipal wastewater effluent and the support of commercial navigation. Approximately 75 percent of the length is composed of man-made canals where no waterway existed previously, and the remainder is composed of natural streams that have been deepened, straightened and/or widened to such an extent that reversion to the natural state is not possible. The flow of water in the CAWS is artificially controlled by hydraulic structures. The CAWS has two river systems, the Calumet River System and the Chicago River System.

Over the years, increased pollutant loading from urbanization throughout the Chicago metropolitan area and low stream velocities in Chicago area deep-draft waterways have caused dissolved oxygen (DO) concentrations to fall below DO standards established by the Illinois Pollution Control Board (IPCB). More than 30 years ago, the Metropolitan Water Reclamation District of Greater Chicago (District) determined that applicable IPCB DO standards for Chicago area waterways could not be met exclusively by advanced wastewater treatment at its three major regional water reclamation plants (WRPs), Calumet, North Side, and Stickney, and by the capture and treatment of combined sewer overflows (CSOs). In order to increase the DO concentration in the Chicago and Calumet River Systems, the District designed and constructed artificial aeration systems (instream diffuser and sidestream elevated pool aeration [SEPA] stations) during the late 1970s and early 1990s, respectively.

From October 1994 through May 1996, the Monitoring and Research Department (M&R) conducted weekly DO surveys in the Chicago River System. Water samples were collected manually, chemically fixed in the field, and returned to the laboratory for titration. The results from these surveys showed that DO concentrations in selected waterway reaches were less than IPCB DO standards applicable to these reaches.

In 1998, M&R initiated a comprehensive field-monitoring program in order to locate and identify reaches in the Chicago River System where the DO concentration is less than the applicable IPCB DO standard. Initially, the program was to focus on the Chicago River System for a two-year period and has since been extended. Subsequently, the scope of the monitoring program was first expanded to include the Calumet River System, and then later the Chicago area wadeable streams. The resulting data have been used for the calibration and verification of a water quality model for the CAWS.

Data in this report are from 19 deep-draft continuous DO monitoring stations of the District's Continuous Dissolved Oxygen Monitoring (CDOM) Program. This report covers the monitoring results for the period January 2009 through December 2009 for the deep-draft waterways of the Chicago River System, Calumet River System, and Des Plaines River System.

MONITORING STATIONS

Locations and Descriptions

The CDOM Program supplies the District with water quality data throughout the year for both the wadeable and deep-draft waterways within its jurisdiction. All of the 2009 CDOM stations are shown in Figure 1. Descriptions of the locations for the deep-draft monitoring 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, and the Chicago and Calumet Rivers.

Secondary Contact Waters include the North Shore Channel from the North Side WRP to the North Branch of the Chicago River, the North Branch of the Chicago River from the North Shore Channel to the Chicago River, the South Branch of the Chicago River, Bubbly Creek, the Chicago Sanitary and Ship Canal (CSSC), 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 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. On December 18, 2009, the United States Environmental Protection Agency approved new DO standards for General Use Waters in the state of Illinois. In General Use Waters the DO shall not be less than 3.5 mg/L at any time and meet a 4.0 mg/L daily minimum averaged over 7 days from August through February. In General Use Waters the DO shall not be less than 5.0 mg/L at any time and meet a 6.0 mg/L daily mean averaged over 7 days from March through July. For this report, we have selected the any time standard when calculating percent compliance.

MATERIALS AND METHODS

Water Quality Monitor

The continuous water quality monitors (monitor) used to collect this 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. Two different installation designs were employed: (1) a 3-foot length of 8-inch diameter stainless steel pipe, secured to shore by means of a chain, was positioned on the bottom of the waterway and oriented downstream such that the water passed through the pipe, and (2) a fixed length of 8-inch diameter stainless steel pipe, with multiple 2-inch circular openings, was vertically mounted on the side of a bridge abutment.

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 winkler 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 monitors were temporarily stored in holding tanks containing tap water for subsequent deployment during the following week.

Data Management and Review

Hourly DO data were directly exported electronically from individual monitors to a specially designed Access[®] database for data processing and storage. Following data downloading, the weekly DO data were carefully reviewed for accuracy.

The review process included the following:

1. Comparing a grab sample DO concentration measured in the field with a DO concentration recorded by a retrieved monitor (DO rejection criteria = difference greater than 2.0 mg/L).
2. Comparing the last hourly DO concentration measured by a retrieved monitor with the first hourly DO concentration recorded by a deployed monitor (DO rejection criteria = difference greater than 2.0 mg/L).
3. Comparing a DO concentration measured in a laboratory holding tank and a DO concentration recorded by a retrieved monitor (DO rejection criteria = difference greater than 1.0 mg/L).

Criterion No. 3 would entail rejection of all hourly readings; Criteria Nos. 1 and 2 may or may not reject all readings.

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 2009, cross-sectional DO surveys were conducted in the CAWS and Des Plaines River System to determine if a fixed continuous monitoring location represented the DO concentration across the waterway (Table A-20). 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 showed that the differences across the waterway were generally minimal (coefficient of variation < 10%) and equivalent (< 2 mg/L difference) to the DO concentration measured by the monitor at the fixed locations.

RESULTS

The annual minimum, maximum, and mean DO concentrations measured at all 19 stations during 2009 are shown in Table 2.

The number and percent of measured DO concentrations rejected and removed from the Access[®] database following review during 2009 are summarized in Table 3.

The number and percent of DO concentrations above the applicable IPCB DO standard for each waterway during 2009 are presented in Table 4. The DO data shown in Table 4 do not include the DO concentrations rejected during the data review.

Table 5 shows the percent distribution of DO concentrations from <1.0 mg/L to >5.0 mg/L at the 23 monitoring stations during 2009. The current national one-day minimum DO criterion for adult life stages of fish is 3.0 mg/L (Chapman, 1986).

Individual line drawings showing hourly DO concentrations at each monitoring station are indicated in Figures 2 through 21.

Weekly DO summary statistics during 2009 are presented for each monitoring station in Appendix A, Tables A-1 through A-20.

Summary statistics for dissolved oxygen measurements made during cross-sectional surveys are shown in Appendix Table A-21.

Dissolved Oxygen Fluctuations

DO concentrations fluctuate seasonally and daily in the aquatic environment. Cold water holds more DO than warm water, a trend that can typically be seen in annual DO graphs where the colder months have higher mean DO concentrations than the warmer months. Daily fluctuations in DO can be caused by photosynthesis during daylight hours causing a surplus of DO, and, conversely, respiration by aquatic plants and algae during the night, resulting in a deficiency of DO. Slower moving canals dissolve less oxygen from the atmosphere than faster moving streams and rivers. Other deficiencies of DO can occur when oxygen demanding materials are introduced into a waterway or by thermal discharges. Oxygen demanding materials enter a waterway most often through wastewater treatment effluents, CSOs, and stormwater run-off. Wastewater treatment effluents and CSOs contain organic materials that are decomposed by microorganisms which consume DO in the process. Stormwater run-off also can flush organic materials into the waterway. This is most evident during heavy rain storms that result in CSO events containing untreated waste and stormwater. Information regarding CSO events can be found on the District web site (www.mwrd.org).

TABLE 1: DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN
MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System</u>		
Main Street	North Shore Channel	3.5 miles below Wilmette Pumping Station, 0.8 mile above North Side WRP outfall, water quality monitor under Main Street bridge, center of channel, 6 inches above bottom.
Foster Avenue	North Shore Channel	3.2 miles below North Side WRP outfall, 1.5 miles below Devon Aeration Station, 0.1 mile above junction with North Branch Chicago River, water quality monitor on northwest side Foster Avenue bridge, 3 feet below water surface.
Addison Street	North Branch Chicago River	5.2 miles below North Side WRP outfall, water quality monitor on northwest side Addison Street bridge, 3 feet below water surface.
Fullerton Avenue	North Branch Chicago River	7.2 miles below North Side WRP outfall, 0.4 mile above Webster Aeration Station, water quality monitor on northwest side Fullerton Avenue bridge, 3 feet below water surface.
Kinzie Street	North Branch Chicago River	9.9 miles below North Side WRP outfall, 3.1 miles below Webster Aeration Station, 0.2 mile above junction with Chicago River, water quality monitor on northeast side Kinzie Street bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System (Continued)</u>		
Clark Street	Chicago River	1.2 miles below Chicago River Controlling Works, 0.4 mile above junction with South Branch Chicago River, water quality monitor on northeast side Clark Street bridge, 3 feet below water surface.
Loomis Street	South Branch Chicago River	3.6 miles below junction with Chicago River, water quality monitor on northeast side Loomis Street bridge, 3 feet below water surface.
36 th Street	Bubbly Creek	0.2 mile below Racine Avenue Pumping Station, 1.2 miles above junction with South Branch of the Chicago River, water quality monitor attached to concrete wall on west side of river, 3 feet below water surface.
Interstate Highway 55	Bubbly Creek	1.0 mile below Racine Avenue Pumping Station, 0.4 mile above junction with South Branch of the Chicago River, water quality monitor on northeast side I-55 bridge, 3 feet below water surface.
Cicero Avenue	Chicago Sanitary and Ship Canal	1.5 miles above Stickney WRP outfall, 1.1 miles below Crawford Generating Station cooling water discharge, water quality monitor on northeast side Cicero Avenue bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System (Continued)</u>		
B&O Central Railroad	Chicago Sanitary and Ship Canal	3.6 miles below Stickney WRP outfall, water quality monitor in center of canal, east side B&O Central RR bridge, 3 feet below water surface.
Route 83	Chicago Sanitary and Ship Canal	1.2 miles above junction with Calumet-Sag Channel, 1.1 miles above Canal Junction SEPA Station, water quality monitor 0.6 mile above Route 83 bridge, center of canal, 6 inches above bottom.
Lockport Powerhouse	Chicago Sanitary and Ship Canal	0.1 mile above Lockport Powerhouse, 1.1 miles above junction with Des Plaines River, water quality monitor on north side of canal, in forebay area on fender wall, 3 feet below water surface.
<u>Des Plaines River System</u>		
Jefferson Street	Des Plaines River	3.0 miles below Lockport Lock, 2.1 miles below junction with Chicago Sanitary and Ship Canal, water quality monitor on southeast side Jefferson Street bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Calumet River System</u>		
C&W Indiana Railroad	Little Calumet River	5.2 miles below SEPA 1, 1.5 miles above SEPA 2, 3.6 miles below Thomas J. O'Brien Lock and Dam, 1.3 miles above Calumet WRP out-fall, water quality monitor attached to northeast side C&W Indiana RR bridge, 3 feet below water surface.
Halsted Street	Little Calumet River	7.7 miles below SEPA 1, 1.0 mile below SEPA 2, 1.2 miles below Calumet WRP, 0.5 mile above junction with Calumet-Sag Channel, water quality monitor attached to southeast side Halsted Street bridge, 3 feet below water surface.
Cicero Avenue	Calumet-Sag Channel	3.1 miles below SEPA 3, 3.3 miles above SEPA 4, water quality monitor attached to northwest side Cicero Avenue bridge, 3 feet below water surface.
104 th Avenue	Calumet-Sag Channel	4.6 miles below SEPA 4, 3.2 miles above Canal Junction SEPA Station, water quality monitor in center of channel, 6 inches above bottom.
Route 83	Calumet-Sag Channel	0.4 mile above junction with Chicago Sanitary and Ship Canal, 0.3 mile above Canal Junction SEPA Station, water quality monitor on southwest side Illinois Central-Gulf RR bridge, 3 feet below water surface.

TABLE 2: MINIMUM, MAXIMUM, AND MEAN HOURLY DISSOLVED OXYGEN CONCENTRATIONS¹ FOR THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM DURING 2009

Monitoring Station	Waterway	DO Concentration (mg/L)		
		Minimum	Maximum	Mean
<u>Chicago River System</u>				
Main Street	North Shore Channel	0.0	22.6	6.8
Foster Avenue	North Shore Channel	4.4	11.5	8.0
Addison Street	North Branch Chicago River	3.4	12.7	8.2
Fullerton Avenue	North Branch Chicago River	2.9	12.3	7.6
Kinzie Street	North Branch Chicago River	3.1	13.6	7.1
Clark Street	Chicago River	5.6	15.0	9.6
Loomis Street	South Branch Chicago River	2.9	13.0	7.7
36 th Street	Bubbly Creek	0.0	21.0	3.1
Interstate Highway 55	Bubbly Creek	0.0	12.6	4.4
Cicero Avenue	Chicago Sanitary and Ship Canal	0.7	12.0	6.4
B&O Central Railroad	Chicago Sanitary and Ship Canal	2.4	10.6	7.0
Route 83	Chicago Sanitary and Ship Canal	0.8	10.0	5.8
Lockport Powerhouse	Chicago Sanitary and Ship Canal	2.3	11.9	6.5
<u>Des Plaines River System</u>				
Jefferson Street	Des Plaines River	2.0	12.4	7.6
<u>Calumet River System</u>				
C&W Indiana Railroad	Little Calumet River	0.3	18.8	8.4
Halsted Street	Little Calumet River	1.8	11.8	6.8
Cicero Avenue	Calumet-Sag Channel	1.6	11.6	7.0
104 th Avenue	Calumet-Sag Channel	2.3	10.2	6.2
Route 83	Calumet-Sag Channel	3.1	13.2	7.0

¹Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor.

TABLE 3: NUMBER AND PERCENT OF DISSOLVED OXYGEN VALUES NOT MEETING ACCEPTANCE CRITERIA¹ FOR THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM DURING 2009

Monitoring Station	Waterway	Number of DO Values Rejected	Percent of DO Values Rejected
<u>Chicago River System</u>			
Main Street	North Shore Channel	1,632	19
Foster Avenue	North Shore Channel	502	6
Addison Street	North Branch Chicago River	166	2
Fullerton Avenue	North Branch Chicago River	845	10
Kinzie Street	North Branch Chicago River	671	8
Clark Street	Chicago River	339	4
Loomis Street	South Branch Chicago River	360	4
36 th Street	Bubbly Creek	901	10
Interstate Highway 55	Bubbly Creek	816	9
Cicero Avenue	Chicago Sanitary and Ship Canal	900	10
B&O Central Railroad	Chicago Sanitary and Ship Canal	830	9
Route 83	Chicago Sanitary and Ship Canal	2,027	23
Lockport Powerhouse	Chicago Sanitary and Ship Canal	847	10
<u>Des Plaines River System</u>			
Jefferson Street	Des Plaines River	815	9
<u>Calumet River System</u>			
C&W Indiana Railroad	Little Calumet River	334	4
Halsted Street	Little Calumet River	2	<1
Cicero Avenue	Calumet-Sag Channel	507	6
104 th Avenue	Calumet-Sag Channel	5,353	61
Route 83	Calumet-Sag Channel	674	8

¹Dissolved 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 STANDARD¹ FOR THE DEEP-DRAFT CHICAGO
WATERWAY SYSTEM DURING 2009

Monitoring Station	Waterway	IPCB DO Standard	Number of DO Values	Number Above Standard	Percent Above Standard
<u>Chicago River System</u>					
Main Street	North Shore Channel	3.5-5.0*	7,128	5,259	74
Foster Avenue	North Shore Channel	4.0	8,258	8,258	100
Addison Street	North Branch Chicago River	4.0	8,594	8,593	>99
Fullerton Avenue	North Branch Chicago River	4.0	7,915	7,902	>99
Kinzie Street	North Branch Chicago River	4.0	8,089	8,028	99
Clark Street	Chicago River	3.5-5.0*	8,421	8,421	100
Loomis Street	South Branch Chicago River	4.0	8,400	8,373	>99
36 th Street	Bubbly Creek	4.0	7,859	2,778	35
Interstate Highway 55	Bubbly Creek	4.0	7,944	4,507	57
Cicero Avenue	Chicago Sanitary and Ship Canal	4.0	7,860	6,892	88
B&O Central Railroad	Chicago Sanitary and Ship Canal	4.0	7,930	7,823	99
Route 83	Chicago Sanitary and Ship Canal	4.0	6,733	5,832	87
Lockport Powerhouse	Chicago Sanitary and Ship Canal	4.0	7,913	7,353	93
<u>Des Plaines River System</u>					
Jefferson Street	Des Plaines River	4.0	7,945	7,875	99
<u>Calumet River System</u>					
C&W Indiana Railroad	Little Calumet River	4.0	8,426	7,729	92
Halsted Street	Little Calumet River	4.0	8,758	8,602	98
Cicero Avenue	Calumet-Sag Channel	3.0	8,253	8,248	>99
104 th Avenue	Calumet-Sag Channel	3.0	3,407	3,386	99
Route 83	Calumet-Sag Channel	3.0	8,086	8,086	100

¹Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor.

*IPCB general use DO standard is 5.0 mg/L from March through July and 3.5 mg/L for the balance of the year.

TABLE 5: PERCENT OF DISSOLVED OXYGEN VALUES IN SELECTED RANGES FOR THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM DURING 2009

Monitoring Station	Waterway	Percent of DO Values in Range (mg/L)					
		0-<1	1-<2	2-<3	3-<4	4-<5	≥5
<u>Chicago River System</u>							
Main Street	North Shore Channel	8	5	7	7	4	68
Foster Avenue	North Shore Channel	0	0	0	0	<1	>99
Addison Street	North Branch Chicago River	0	0	0	<1	<1	>99
Fullerton Avenue	North Branch Chicago River	0	0	<1	<1	2	98
Kinzie Street	North Branch Chicago River	0	0	0	1	10	90
Clark Street	Chicago River	0	0	0	0	0	100
Loomis Street	South Branch Chicago River	0	0	<1	<1	3	97
36 th Street	Bubbly Creek	41	11	7	5	7	28
Interstate Highway 55	Bubbly Creek	15	7	10	11	13	44
Cicero Avenue	Chicago Sanitary and Ship Canal	<1	1	3	9	18	70
B&O Central Railroad	Chicago Sanitary and Ship Canal	0	0	<1	1	8	91
Route 83	Chicago Sanitary and Ship Canal	<1	1	3	10	25	62
Lockport Powerhouse	Chicago Sanitary and Ship Canal	0	0	1	7	19	74
<u>Des Plaines River System</u>							
Jefferson Street	Des Plaines River	0	0	<1	1	8	91
<u>Calumet River System</u>							
C&W Indiana Railroad	Little Calumet River	1	2	3	3	3	89
Halsted Street	Little Calumet River	0	<1	<1	1	8	90
Cicero Avenue	Calumet-Sag Channel	0	<1	<1	1	8	92
104 th Avenue	Calumet-Sag Channel	0	0	1	1	16	83
Route 83	Calumet-Sag Channel	0	0	0	2	14	84

FIGURE 1: 2009 CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

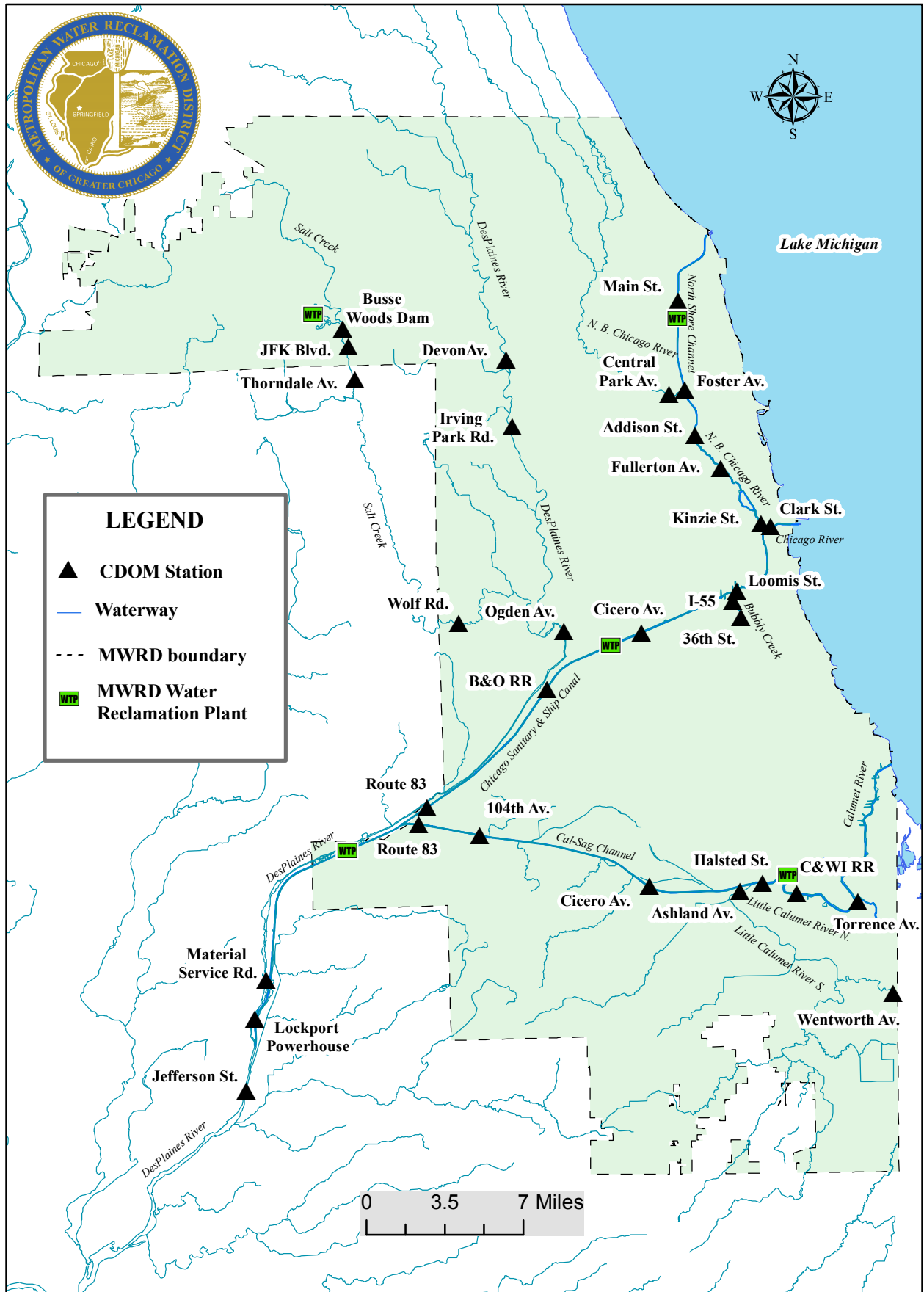


FIGURE 2: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT MAIN STREET ON THE NORTH SHORE CHANNEL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

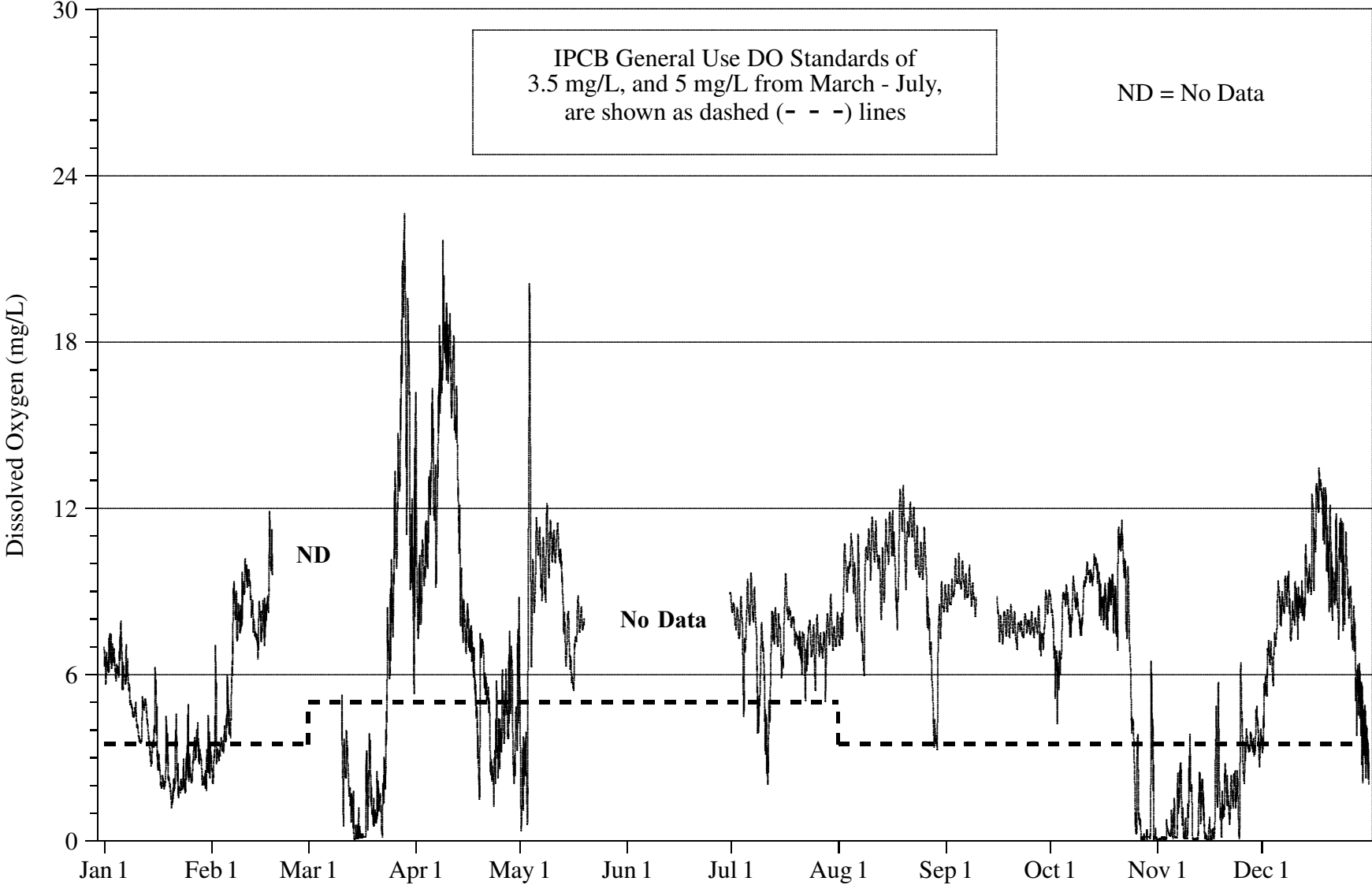


FIGURE 3: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT FOSTER AVENUE ON THE NORTH SHORE CHANNEL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

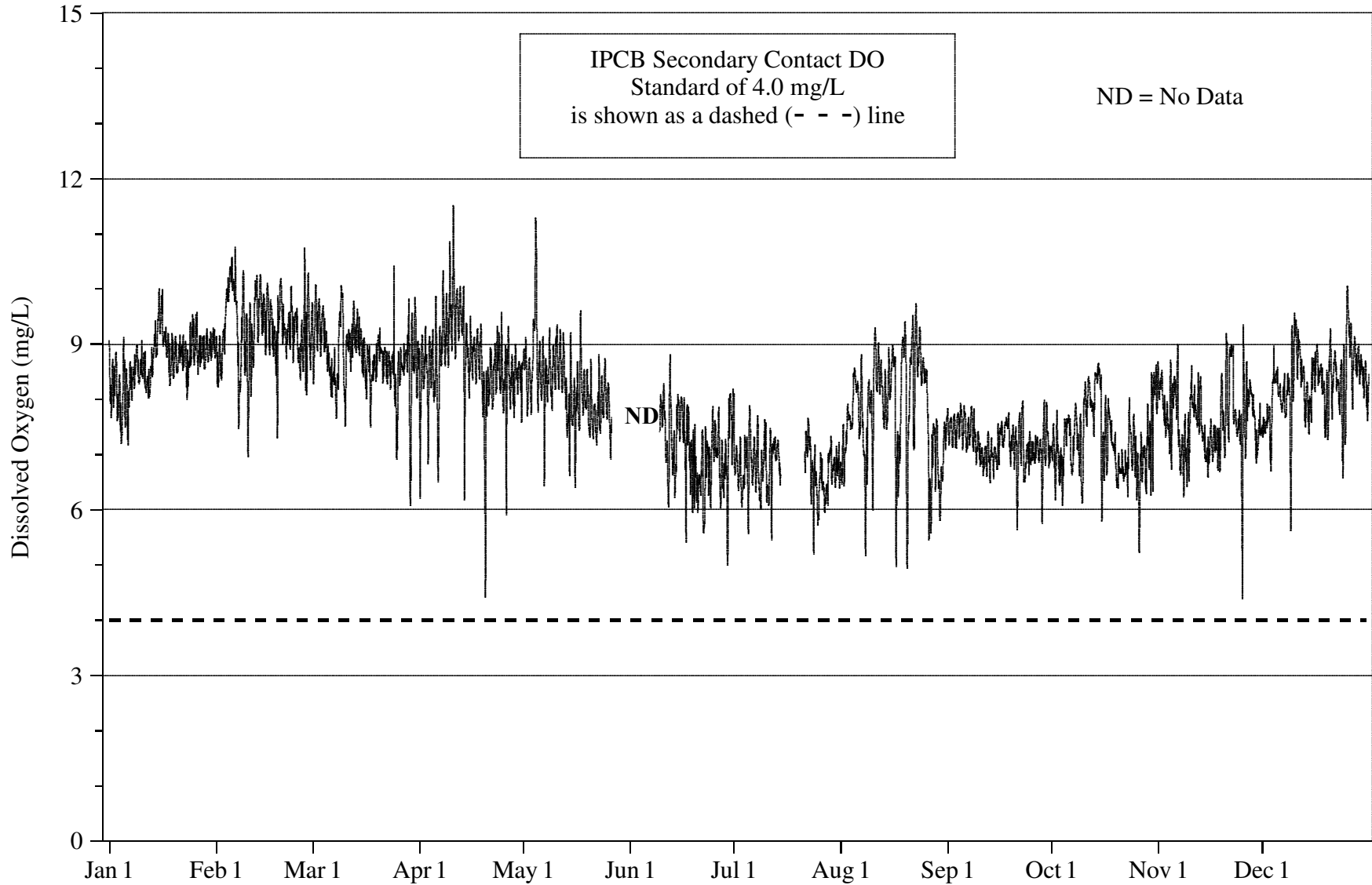


FIGURE 4: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ADDISON STREET ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

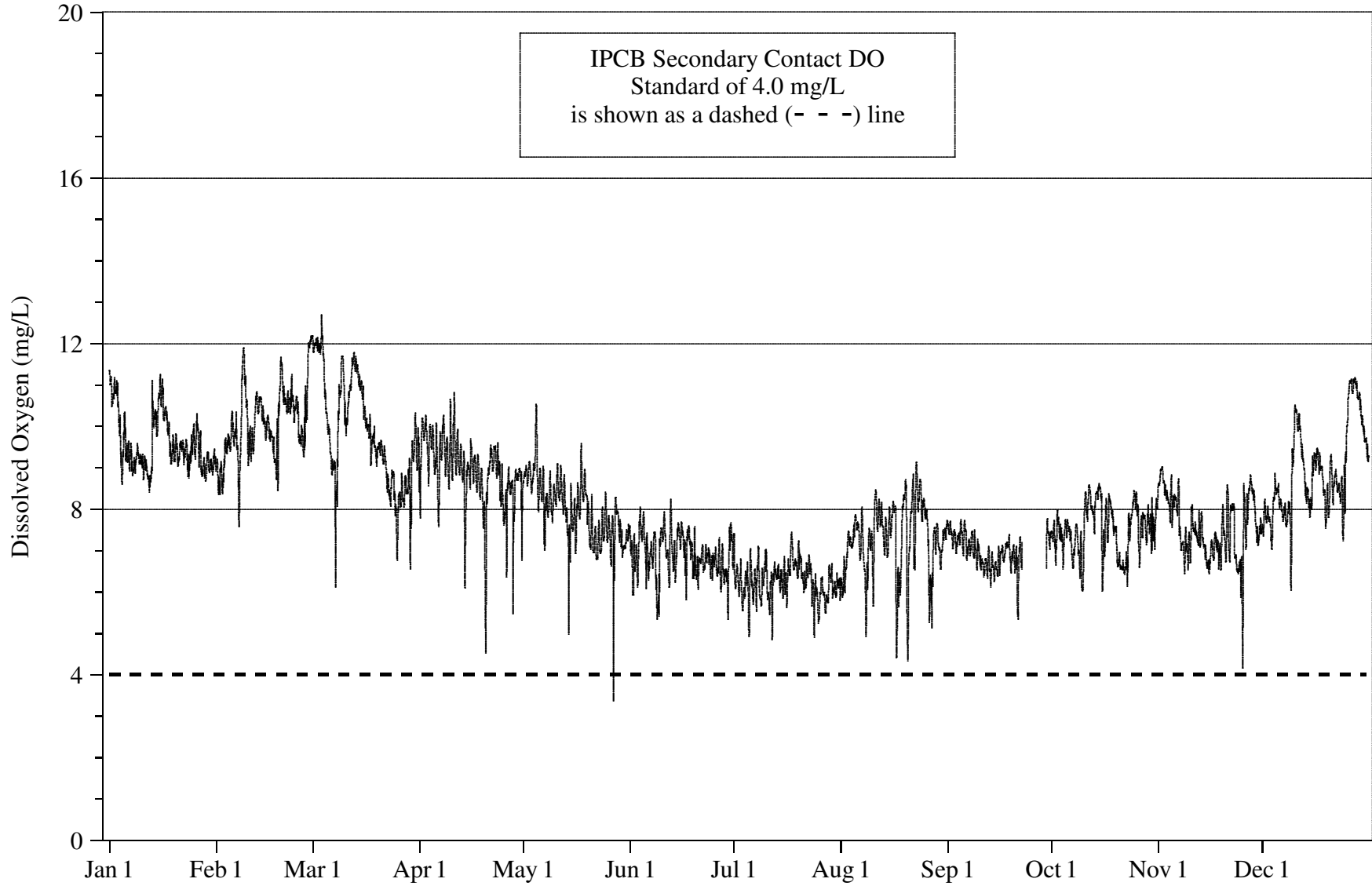


FIGURE 5: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT FULLERTON AVENUE ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

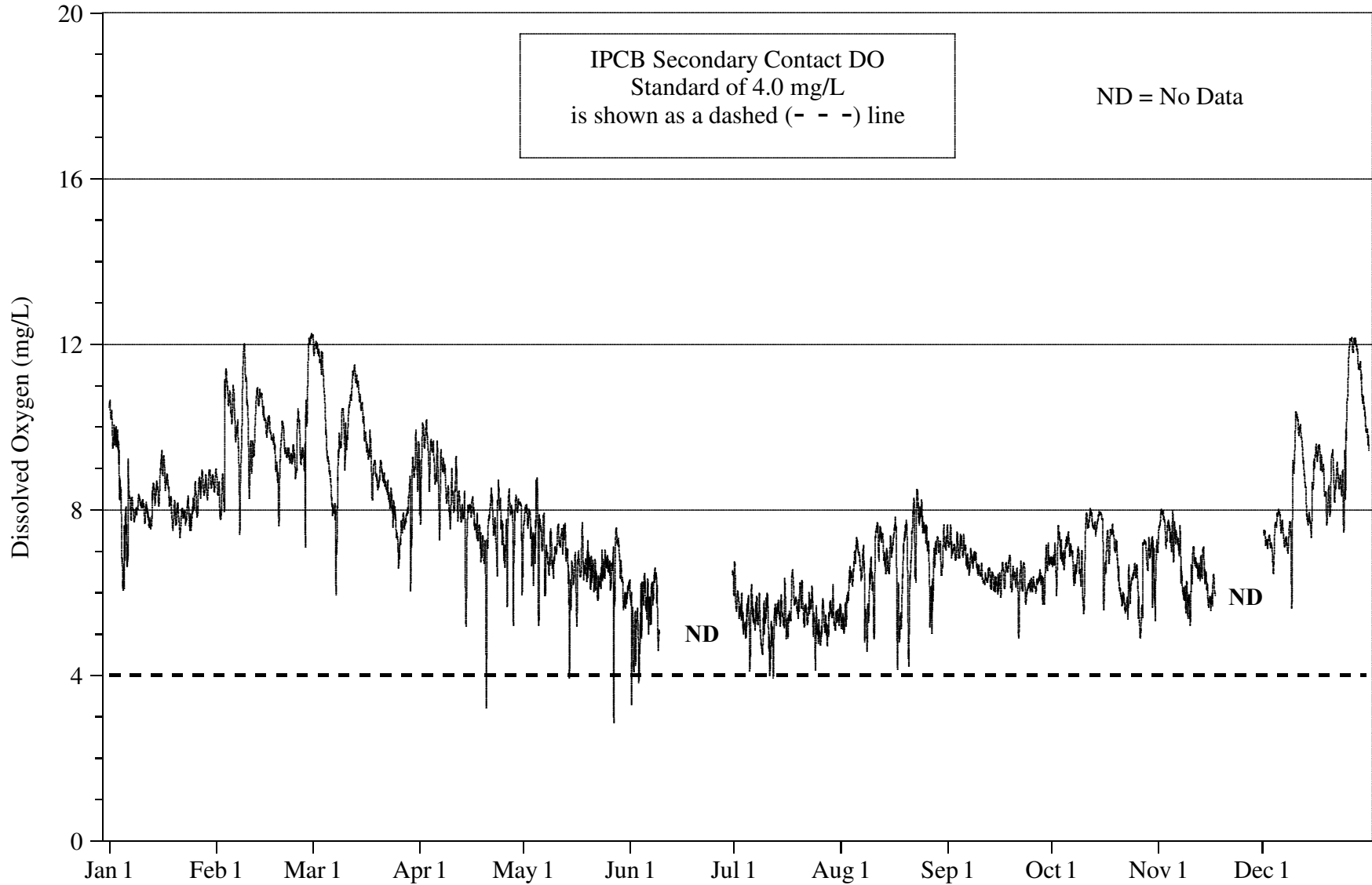


FIGURE 6: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT KINZIE STREET ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

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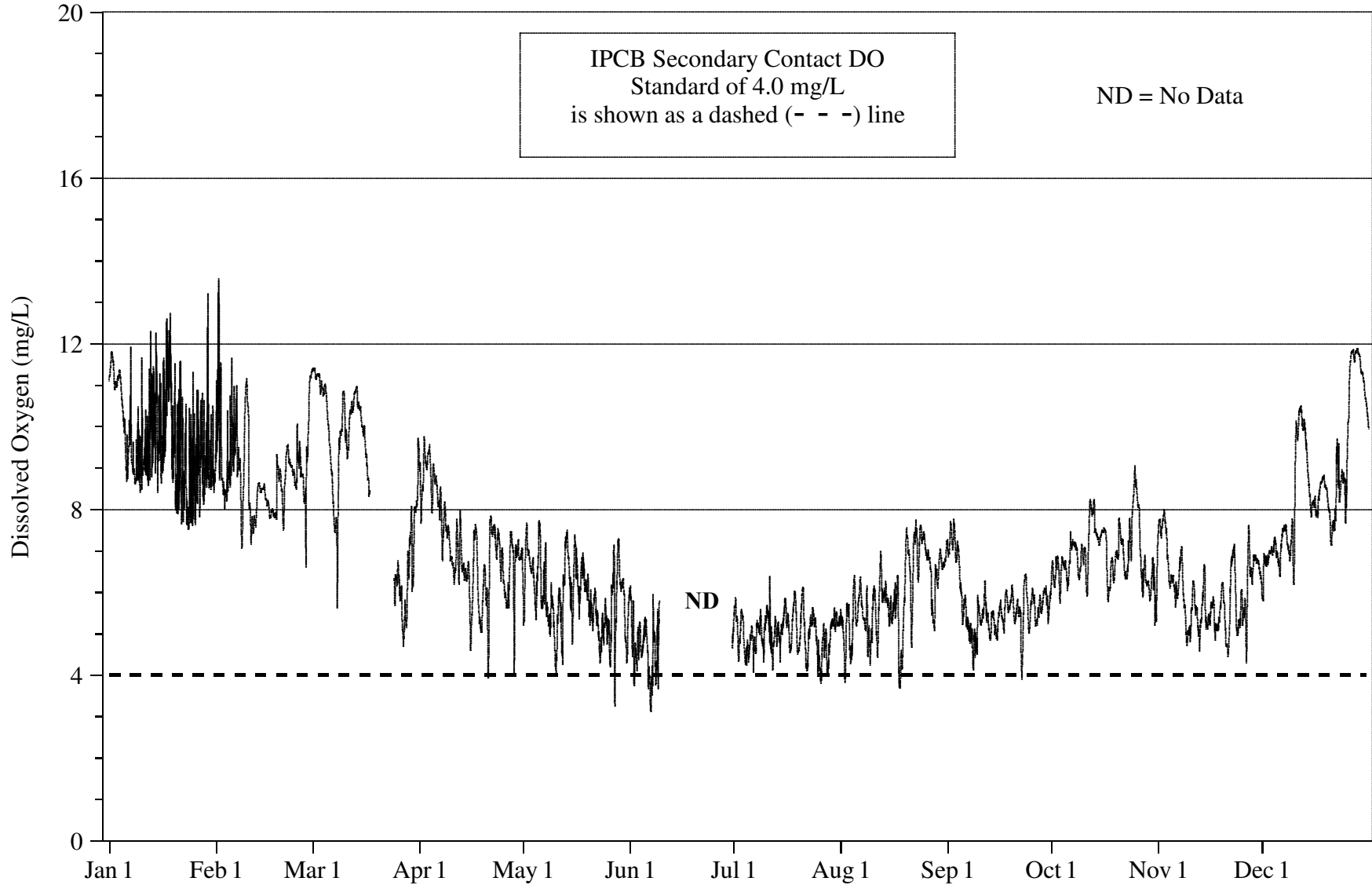


FIGURE 7: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CLARK STREET ON THE CHICAGO RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

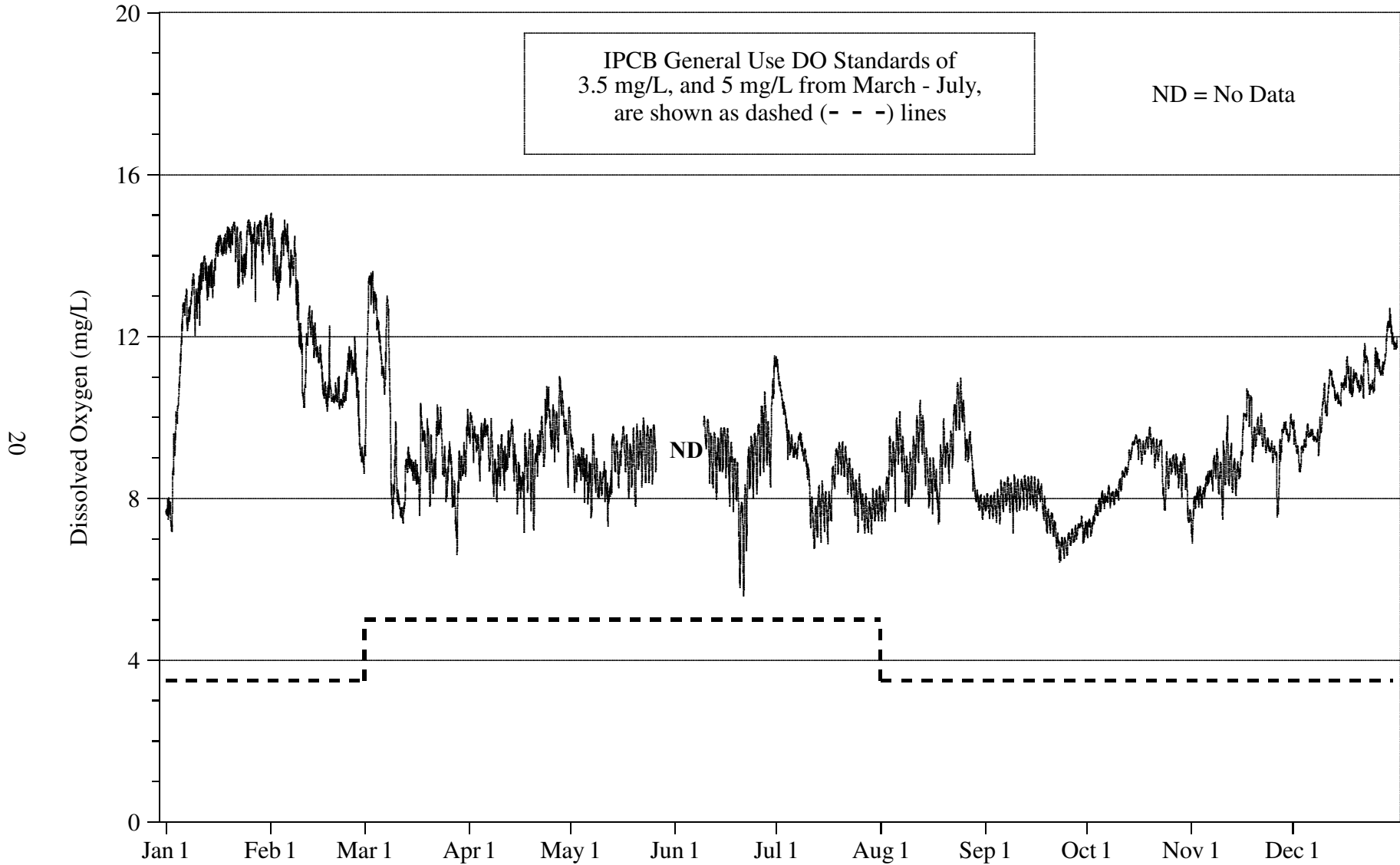


FIGURE 8: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT LOOMIS STREET ON THE SOUTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

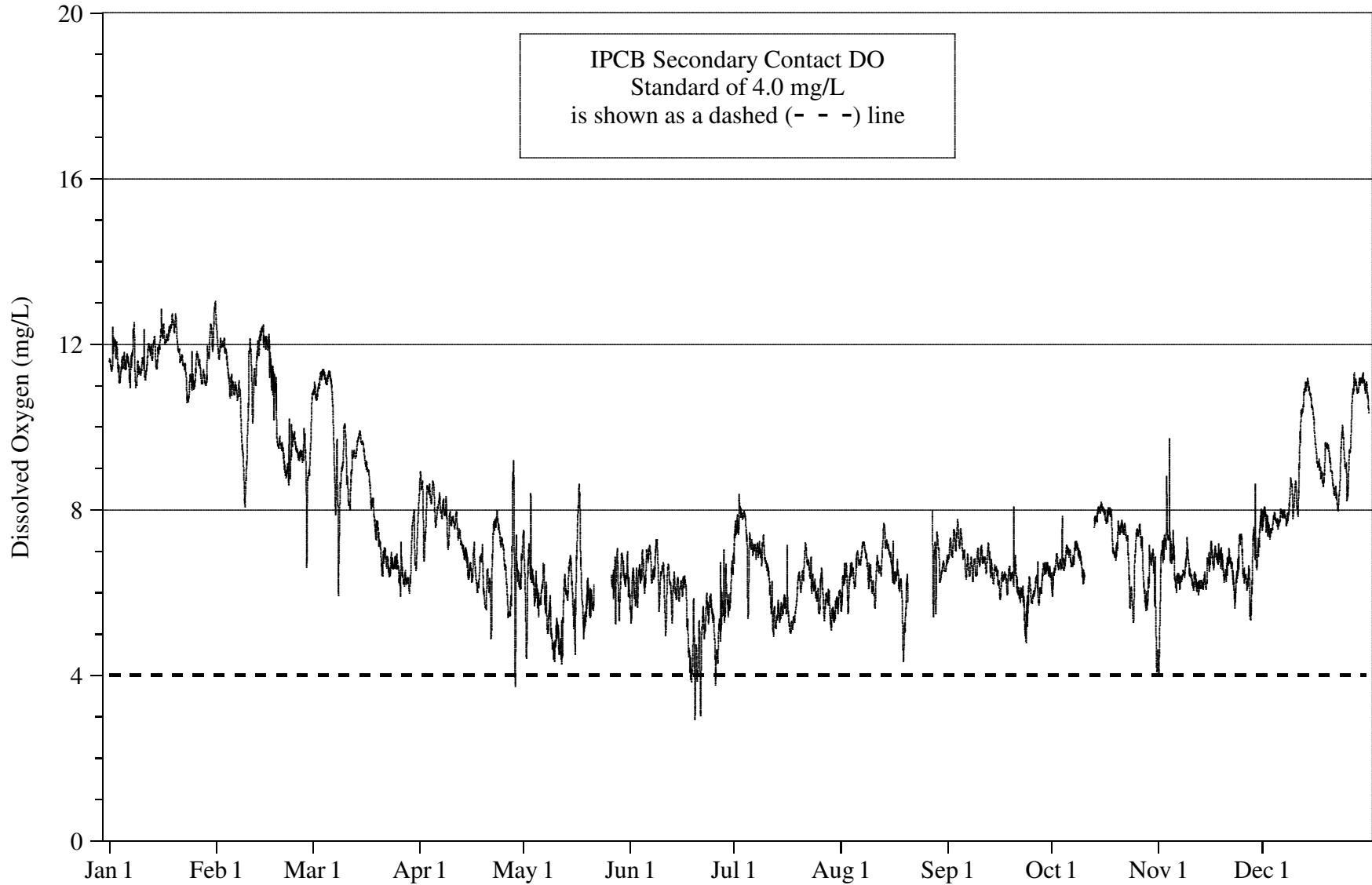


FIGURE 9: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT 36TH STREET ON BUBBLY CREEK FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

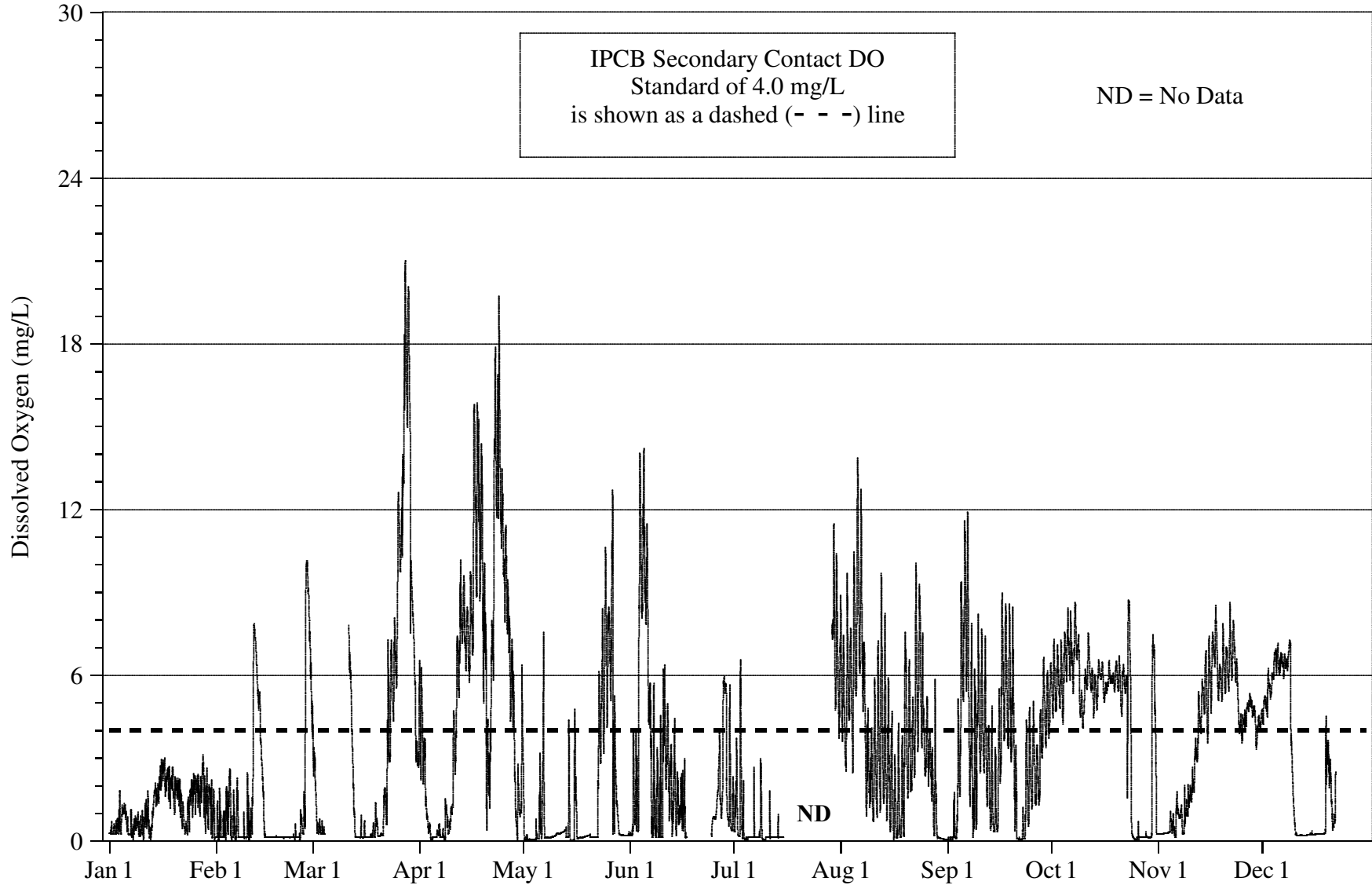


FIGURE 10: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT INTERSTATE HIGHWAY 55 ON BUBBLY CREEK FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

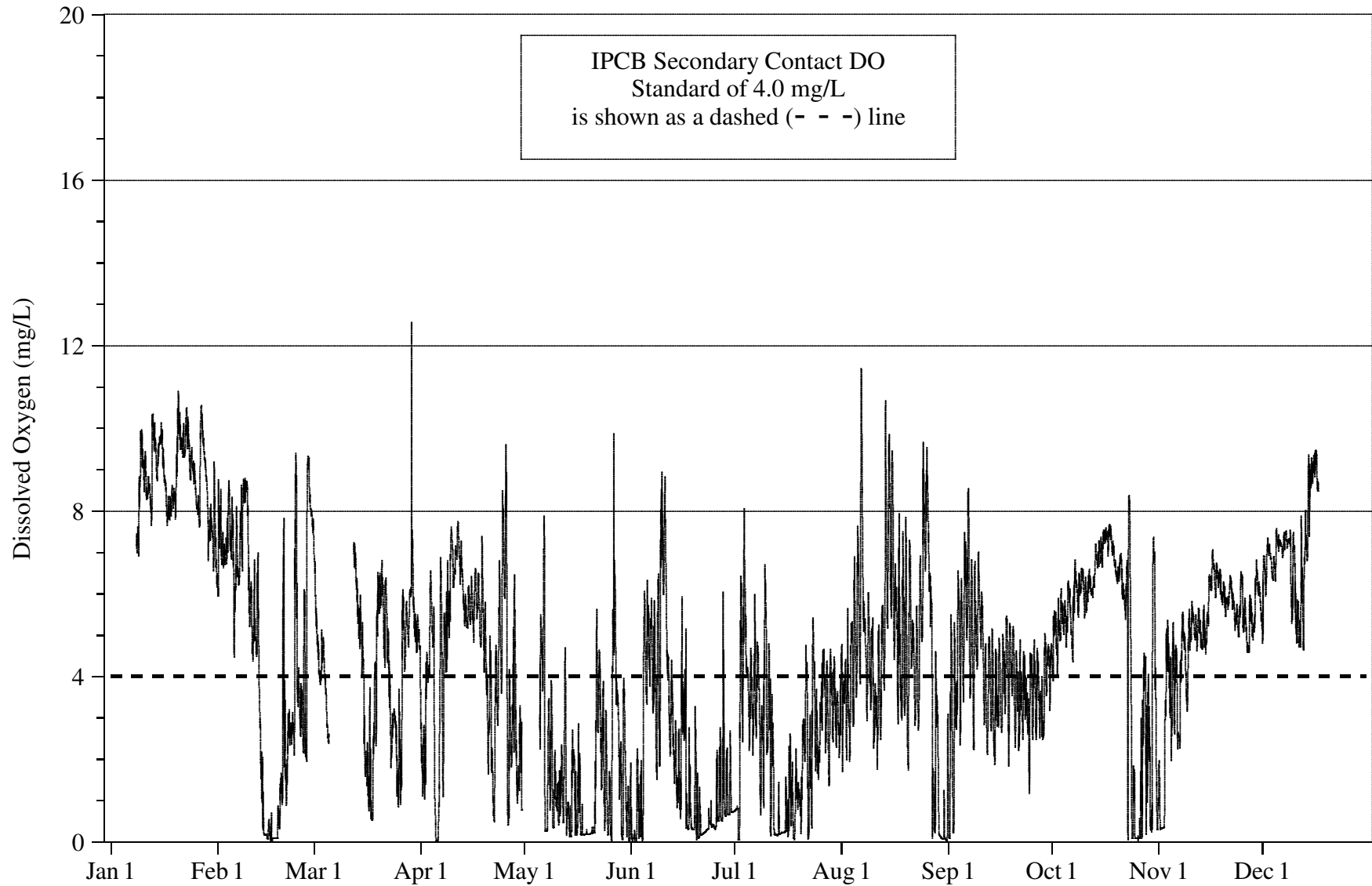


FIGURE 11: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CICERO AVENUE ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

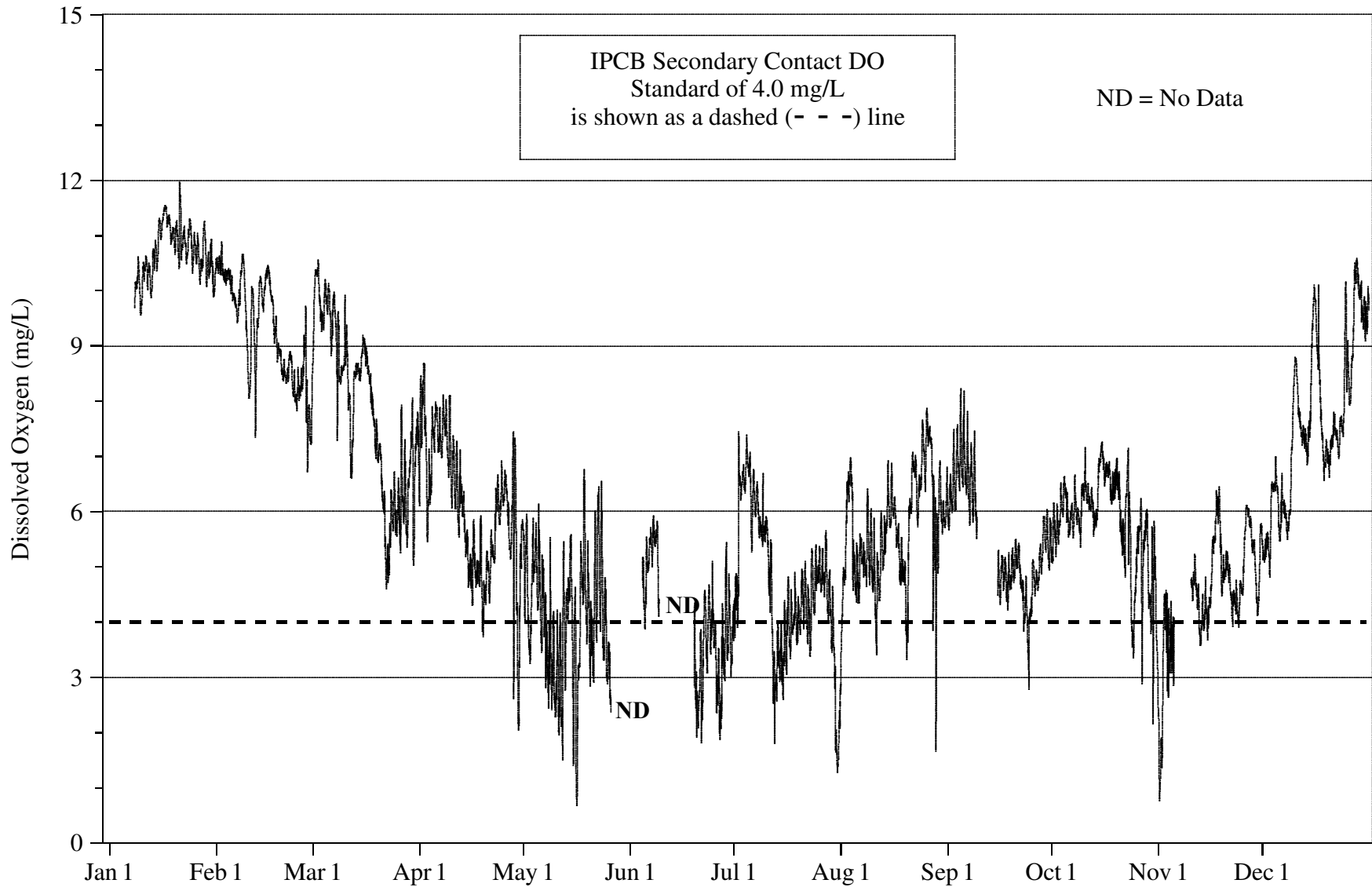


FIGURE 12: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT B&O CENTRAL RAILROAD ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

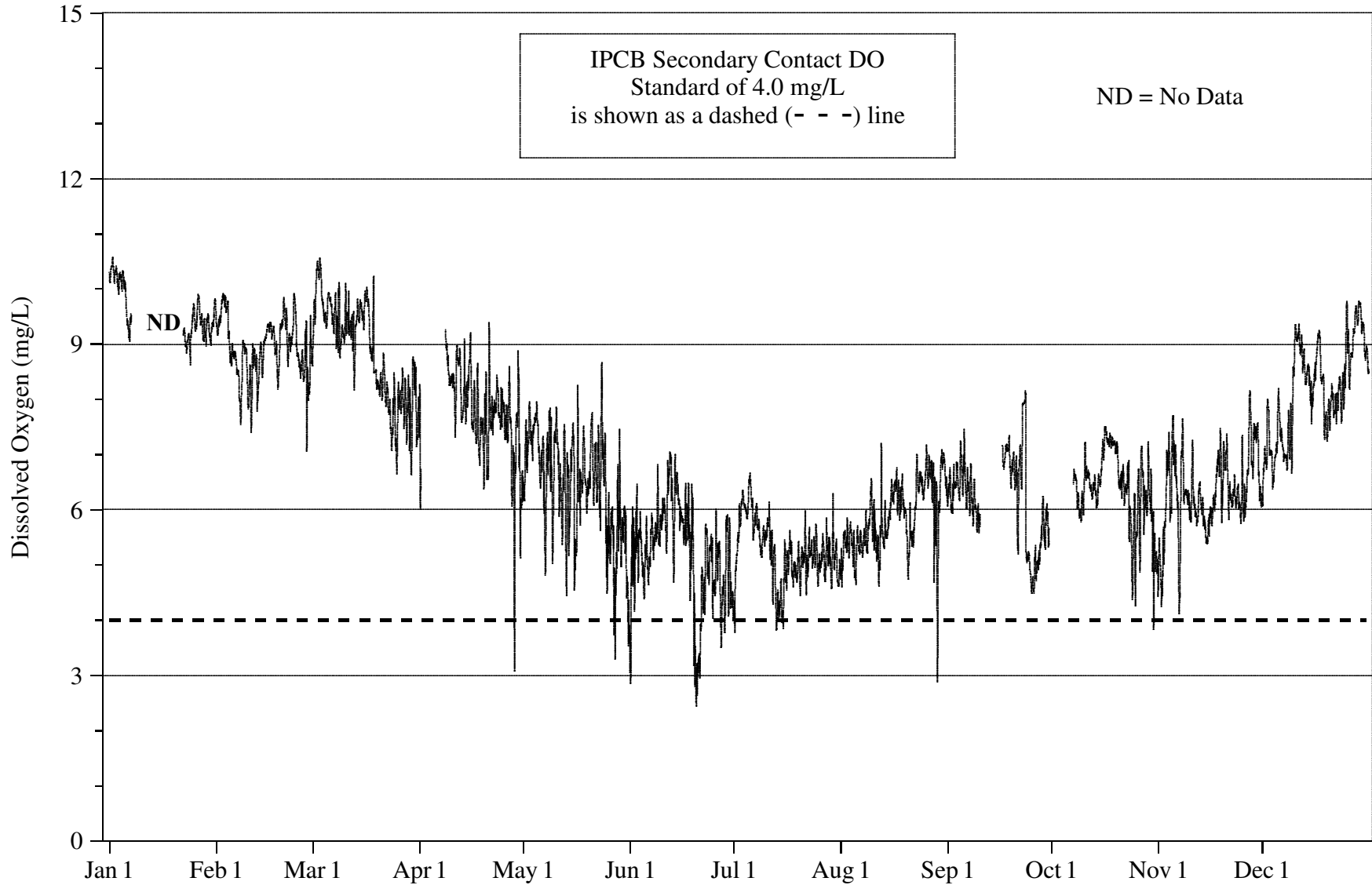


FIGURE 13: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ROUTE 83 ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

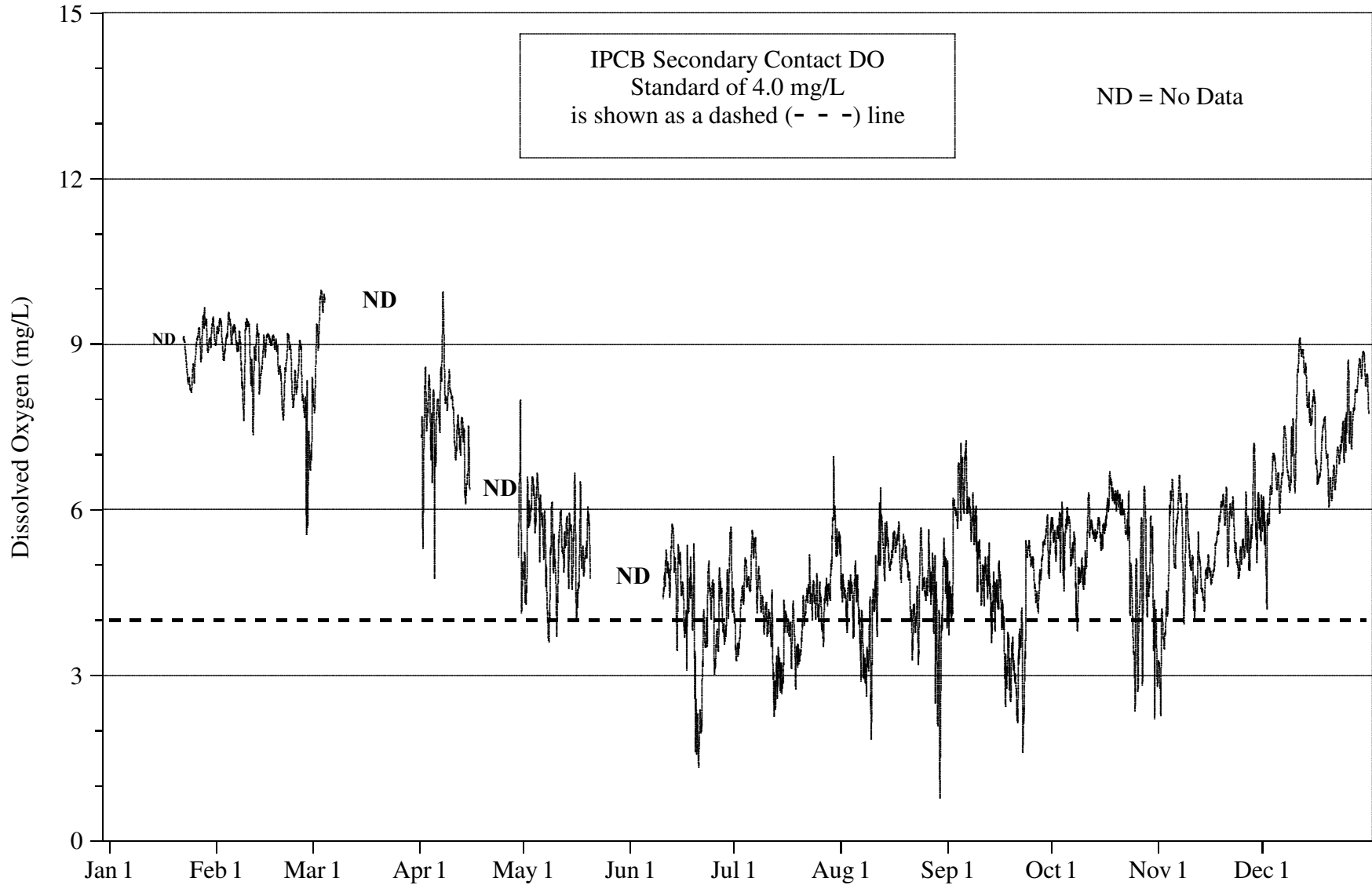


FIGURE 14: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT LOCKPORT POWERHOUSE ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

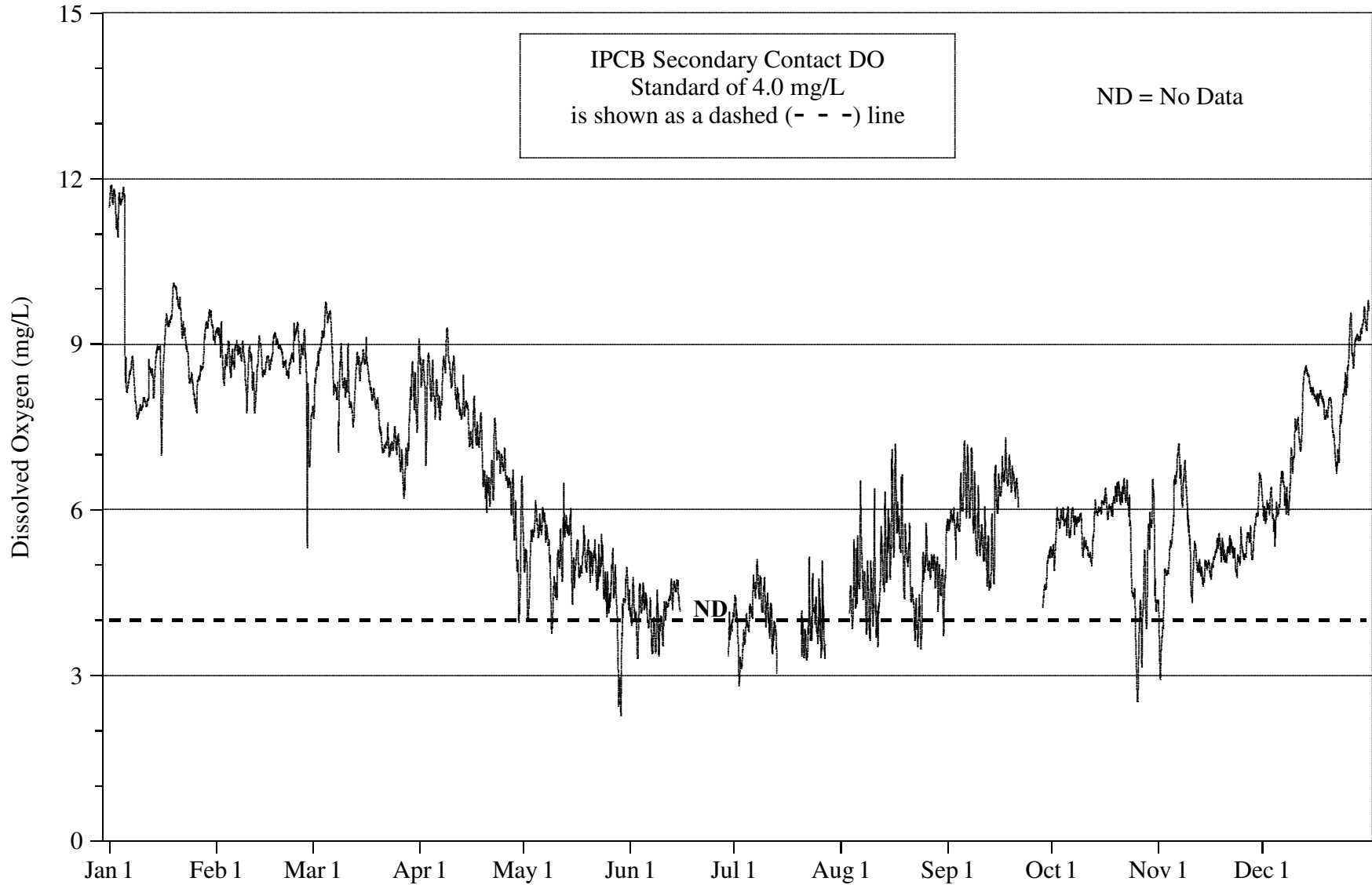


FIGURE 15: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT JEFFERSON STREET ON THE DES PLAINES RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

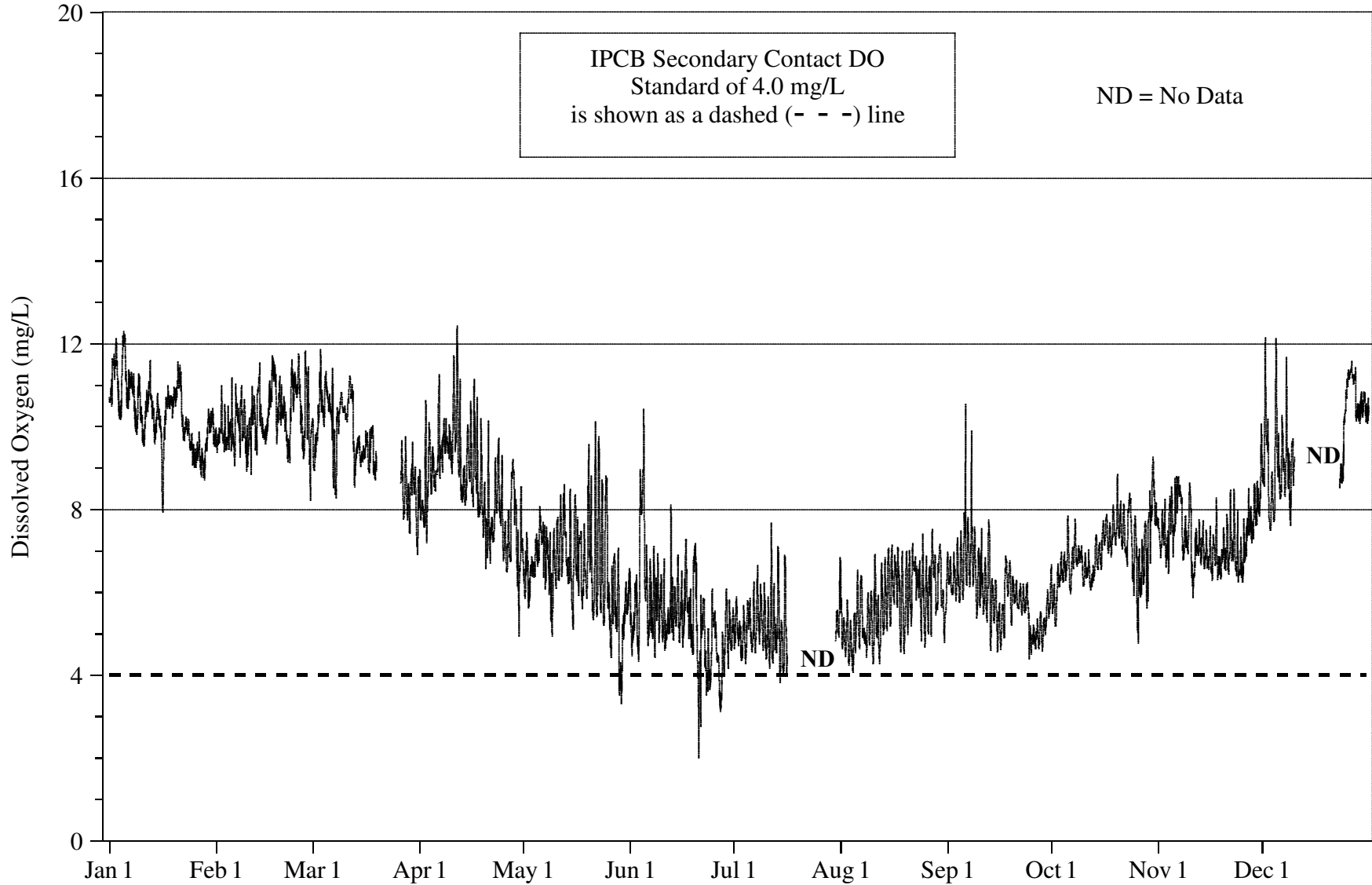


FIGURE 16: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT C&W INDIANA RAILROAD ON THE LITTLE CALUMET RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

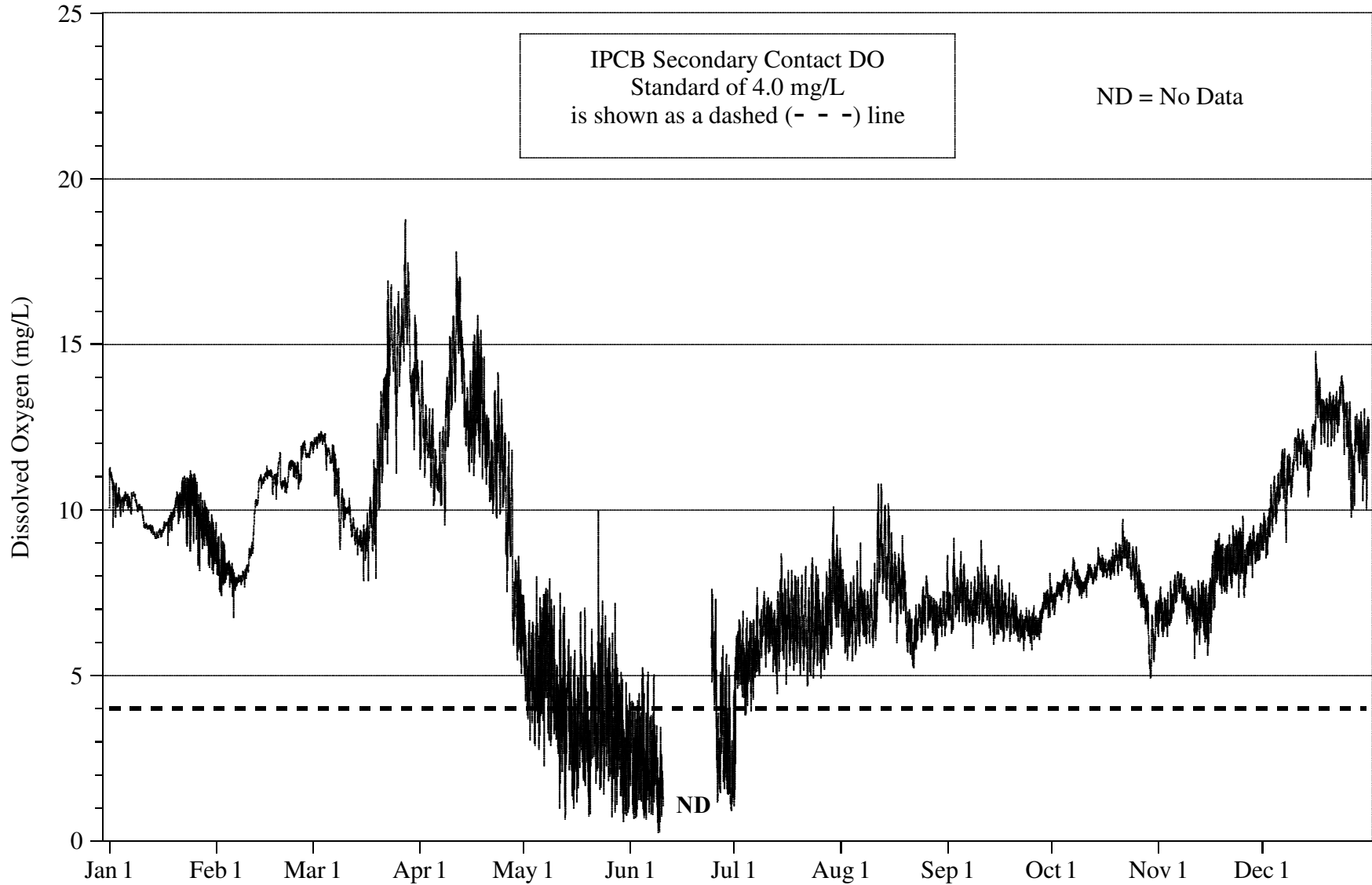


FIGURE 17: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT HALSTED STREET ON THE LITTLE CALUMET RIVER FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

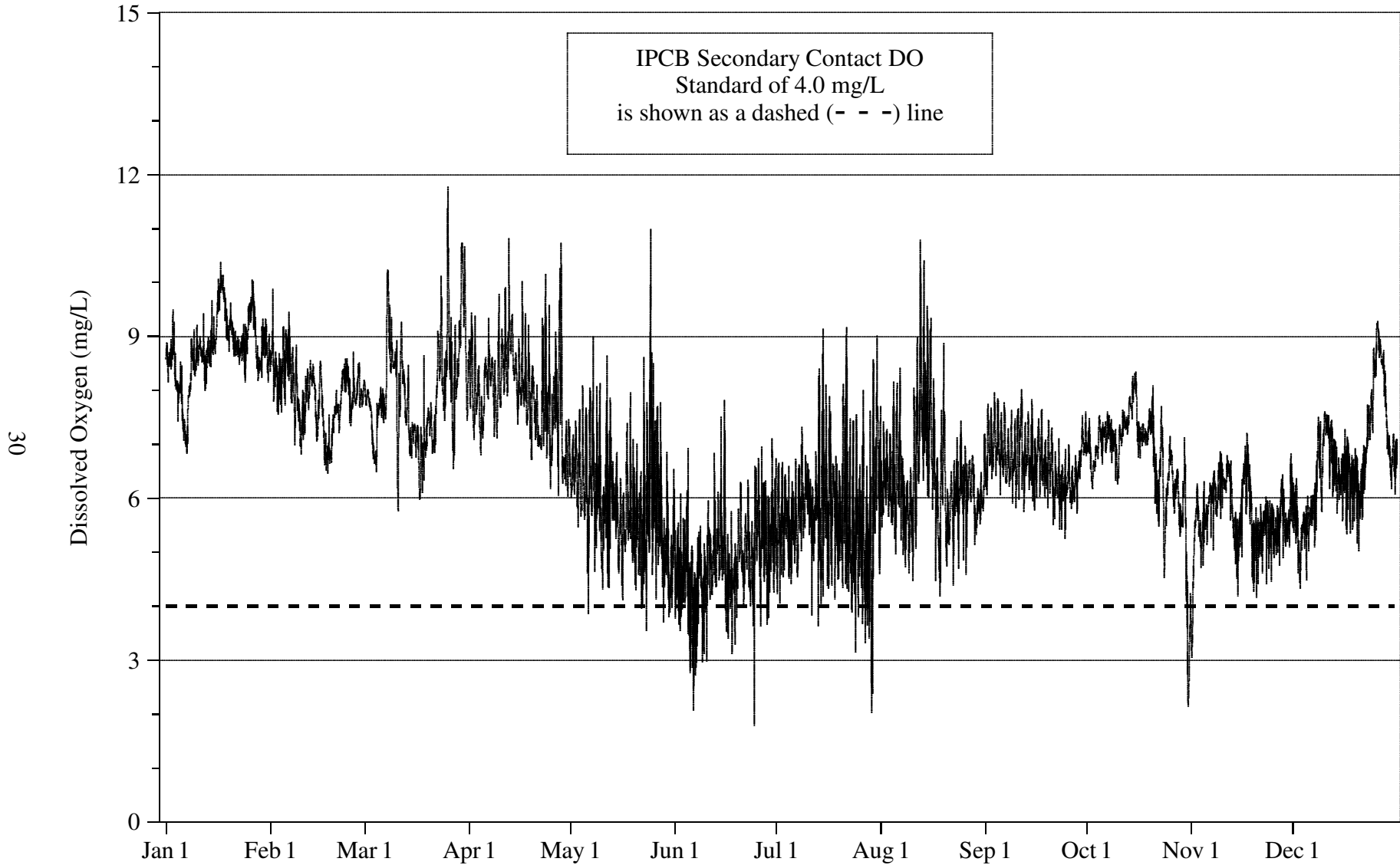


FIGURE 18: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CICERO AVENUE ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

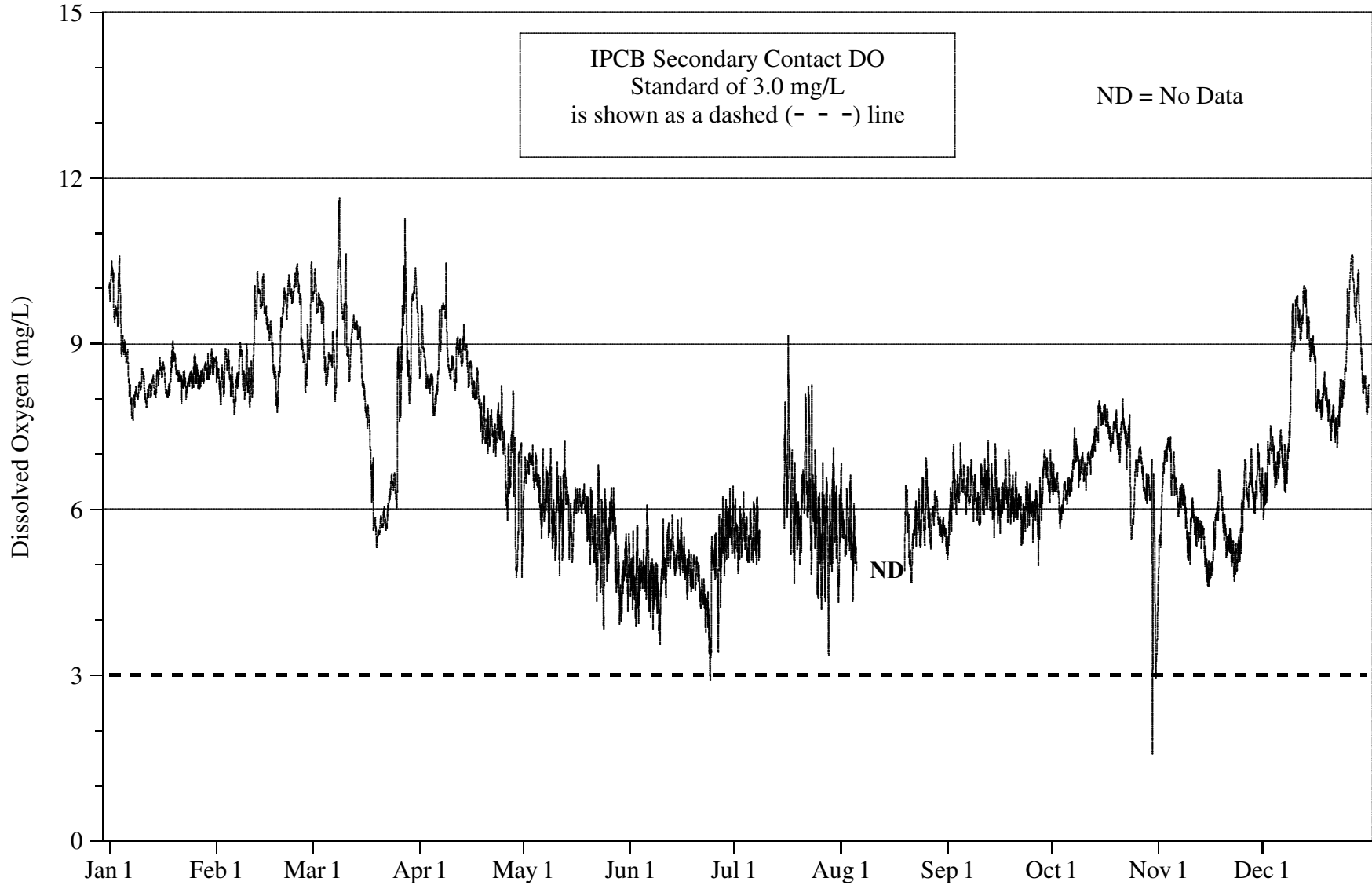


FIGURE 19: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT 104TH AVENUE ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009

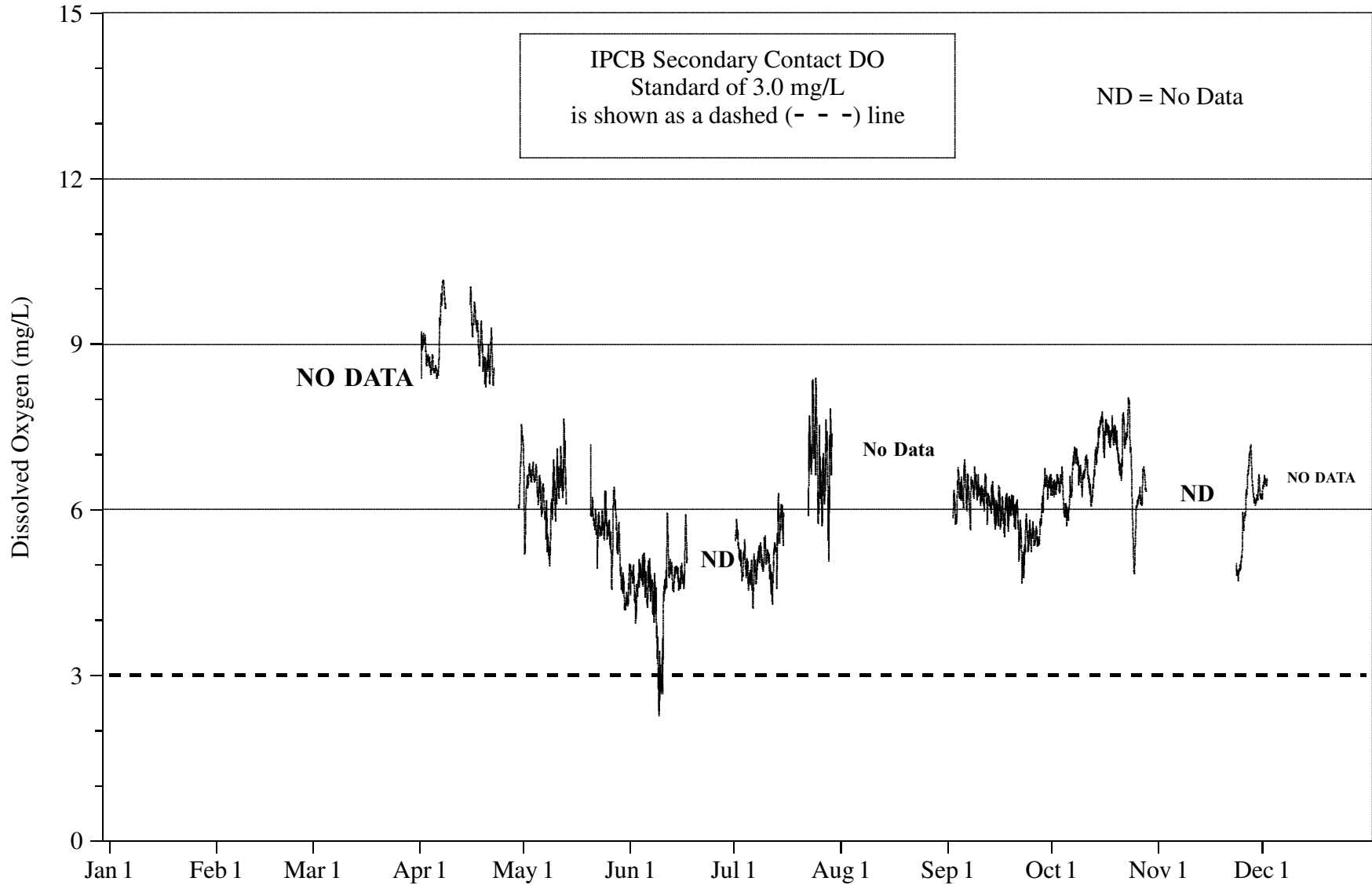
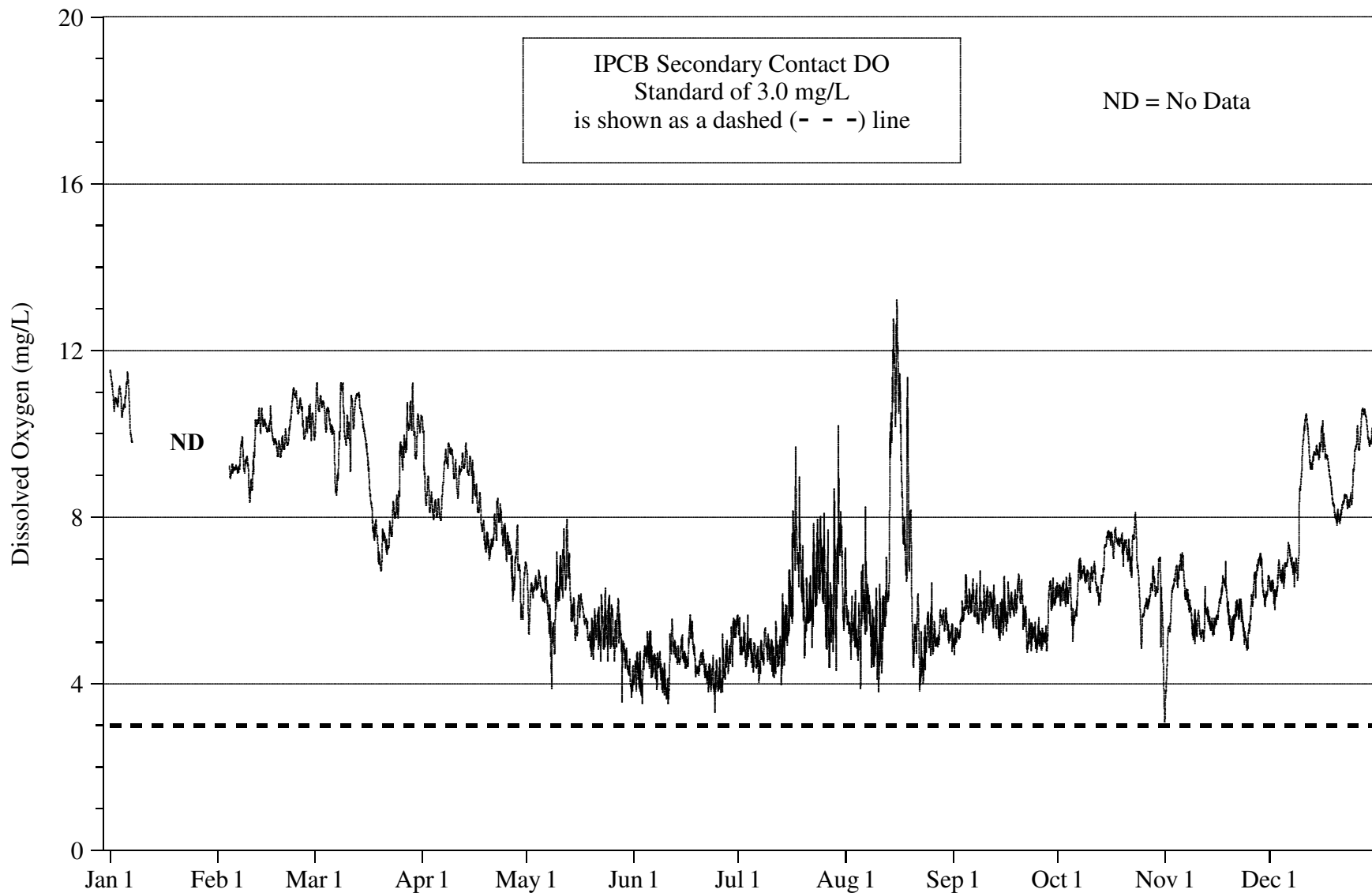


FIGURE 20: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ROUTE 83 ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2009, THROUGH DECEMBER 31, 2009



REFERENCES

Chapman, G., "Water Quality Criteria for Dissolved Oxygen," EPA 440/5-86-003, United States Environmental Protection Agency, Office of Water Regulations and Standards, Washington, D.C., 1986.

Lanyon, R., "Description of the Chicago Waterway System," Use Attainability Analysis Study Conducted by Illinois Environmental Protection Agency in Cooperation with Metropolitan Water Reclamation District of Greater Chicago, Illinois, May 2002.

APPENDIX A

WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
AT ALL DEEP-DRAFT MONITORING STATIONS DURING 2009

TABLE A-1: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
AT MAIN STREET ON THE
NORTH SHORE CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ (3.5, 5.0) mg/L ¹ IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	5.7	7.5	6.5	100
01/05/09 - 01/11/09	168	3.5	7.9	5.2	100
01/12/09 - 01/18/09	168	1.9	6.3	3.5	43
01/19/09 - 01/25/09	168	1.2	4.9	2.3	7
01/26/09 - 02/01/09	168	1.8	4.5	2.8	13
02/02/09 - 02/08/09	168	2.8	9.3	5.2	72
02/09/09 - 02/15/09	168	6.6	10.2	8.4	100
02/16/09 - 02/22/09	63	7.0	11.9	9.1	100
02/23/09 - 03/08/09			NO DATA		
03/09/09 - 03/15/09	130	0.1	5.2	1.5	1
03/16/09 - 03/22/09	168	0.1	3.9	1.2	0
03/23/09 - 03/29/09	168	1.9	22.6	12.2	92
03/30/09 - 04/05/09	168	5.3	16.4	10.9	100
04/06/09 - 04/12/09	168	9.2	21.7	16.0	100
04/13/09 - 04/19/09	168	1.5	13.9	7.1	82
04/20/09 - 04/26/09	168	1.3	7.3	4.3	39
04/27/09 - 05/03/09	168	0.4	20.1	5.1	35
05/04/09 - 05/10/09	168	6.3	14.5	10.1	100
05/11/09 - 05/17/09	168	5.4	11.5	8.2	100
05/18/09 - 05/24/09	37	7.5	8.4	7.9	100
05/25/09 - 06/28/09			NO DATA		
06/29/09 - 07/05/09	131	4.5	9.4	7.9	97
07/06/09 - 07/12/09	168	2.0	9.7	6.5	70
07/13/09 - 07/19/09	167	5.9	9.6	7.7	100
07/20/09 - 07/26/09	168	5.1	8.2	7.0	100
07/27/09 - 08/02/09	168	5.0	10.7	7.7	100
08/03/09 - 08/09/09	168	6.0	11.3	9.3	100
08/10/09 - 08/16/09	168	8.0	11.9	10.4	100
08/17/09 - 08/23/09	168	7.6	12.8	10.8	100
08/24/09 - 08/30/09	168	3.3	11.3	7.7	97
08/31/09 - 09/06/09	168	8.3	10.4	9.1	100
09/07/09 - 09/13/09	64	8.1	9.9	8.9	100
09/14/09 - 09/20/09	128	7.1	8.8	7.9	100
09/21/09 - 09/27/09	168	6.9	8.5	7.7	100

TABLE A-1 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT MAIN STREET ON THE
 NORTH SHORE CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ (3.5, 5.0) mg/L ¹ IPCB Standard
		Minimum	Maximum	Mean	
09/28/09 - 10/04/09	168	4.2	9.0	7.6	100
10/05/09 - 10/11/09	168	7.4	10.1	8.6	100
10/12/09 - 10/18/09	168	7.6	10.3	9.2	100
10/19/09 - 10/25/09	168	0.3	11.6	7.6	88
10/26/09 - 11/01/09	168	0.0	6.5	0.8	9
11/02/09 - 11/08/09	168	0.0	2.8	0.6	0
11/09/09 - 11/15/09	168	0.0	3.8	0.8	1
11/16/09 - 11/22/09	168	0.0	5.7	1.5	7
11/23/09 - 11/29/09	168	0.0	6.4	3.2	37
11/30/09 - 12/06/09	168	2.7	9.4	6.2	88
12/07/09 - 12/13/09	168	7.2	10.7	8.6	100
12/14/09 - 12/20/09	168	8.3	13.5	11.2	100
12/21/09 - 12/27/09	168	6.8	11.8	9.2	100
12/28/09 - 12/31/09	96	2.1	7.0	4.5	78

¹IPCB general use DO standard is 3.5 mg/L, and 5.0 mg/L from March - July.

TABLE A-2: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT FOSTER AVENUE ON THE
 NORTH SHORE CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	7.2	9.1	8.1	100
01/05/09 - 01/11/09	168	7.2	9.1	8.4	100
01/12/09 - 01/18/09	168	8.0	10.0	8.9	100
01/19/09 - 01/25/09	168	8.0	9.5	8.8	100
01/26/09 - 02/01/09	168	8.2	9.6	8.9	100
02/02/09 - 02/08/09	168	7.5	10.8	9.4	100
02/09/09 - 02/15/09	168	7.0	10.3	9.3	100
02/16/09 - 02/22/09	168	7.3	10.2	9.3	100
02/23/09 - 03/01/09	168	8.1	10.7	9.2	100
03/02/09 - 03/08/09	168	7.7	9.8	8.9	100
03/09/09 - 03/15/09	167	7.5	10.1	9.0	100
03/16/09 - 03/22/09	168	7.5	9.3	8.6	100
03/23/09 - 03/29/09	168	6.1	10.4	8.4	100
03/30/09 - 04/05/09	168	6.2	9.9	8.6	100
04/06/09 - 04/12/09	168	6.5	11.5	9.3	100
04/13/09 - 04/19/09	168	4.9	10.1	8.6	100
04/20/09 - 04/26/09	168	4.4	9.6	8.4	100
04/27/09 - 05/03/09	168	7.6	9.4	8.4	100
05/04/09 - 05/10/09	168	6.4	11.3	8.7	100
05/11/09 - 05/17/09	168	6.4	9.6	8.2	100
05/18/09 - 05/24/09	168	7.2	8.8	7.9	100
05/25/09 - 05/31/09	37	6.9	8.3	7.7	100
06/01/09 - 06/07/09			NO DATA		
06/08/09 - 06/14/09	132	6.1	8.8	7.4	100
06/15/09 - 06/21/09	168	5.4	8.0	7.0	100
06/22/09 - 06/28/09	168	5.5	7.9	6.8	100
06/29/09 - 07/05/09	168	5.0	8.2	7.0	100
07/06/09 - 07/12/09	168	5.5	7.7	6.8	100
07/13/09 - 07/19/09	37	6.5	7.3	6.9	100
07/20/09 - 07/26/09	131	5.2	7.7	6.7	100
07/27/09 - 08/02/09	168	6.0	7.9	6.8	100
08/03/09 - 08/09/09	168	5.2	8.8	7.7	100
08/10/09 - 08/16/09	168	5.0	9.3	8.2	100
08/17/09 - 08/23/09	168	4.9	9.7	8.2	100

TABLE A-2 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT FOSTER AVENUE ON THE
 NORTH SHORE CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	5.5	9.1	7.3	100
08/31/09 - 09/06/09	168	7.0	7.9	7.5	100
09/07/09 - 09/13/09	168	6.5	7.9	7.1	100
09/14/09 - 09/20/09	168	6.6	7.8	7.2	100
09/21/09 - 09/27/09	168	5.6	8.0	7.1	100
09/28/09 - 10/04/09	168	5.8	8.0	7.0	100
10/05/09 - 10/11/09	168	6.1	8.4	7.4	100
10/12/09 - 10/18/09	168	5.8	8.7	7.7	100
10/19/09 - 10/25/09	168	6.2	8.0	6.9	100
10/26/09 - 11/01/09	168	5.2	8.7	7.4	100
11/02/09 - 11/08/09	168	6.2	9.0	7.6	100
11/09/09 - 11/15/09	168	6.4	8.6	7.5	100
11/16/09 - 11/22/09	168	6.7	9.2	7.7	100
11/23/09 - 11/29/09	168	4.4	9.3	7.6	100
11/30/09 - 12/06/09	167	6.7	9.0	7.8	100
12/07/09 - 12/13/09	168	5.6	9.6	8.3	100
12/14/09 - 12/20/09	168	7.3	9.3	8.3	100
12/21/09 - 12/27/09	168	6.6	10.1	8.5	100
12/28/09 - 12/31/09	96	7.6	9.0	8.4	100

TABLE A-3: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
AT ADDISON STREET ON THE
NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	8.6	11.4	10.4	100
01/05/09 - 01/11/09	168	8.7	10.3	9.3	100
01/12/09 - 01/18/09	168	8.4	11.3	10.0	100
01/19/09 - 01/25/09	168	8.8	10.1	9.4	100
01/26/09 - 02/01/09	168	8.4	10.3	9.2	100
02/02/09 - 02/08/09	168	7.6	11.9	9.6	100
02/09/09 - 02/15/09	168	9.0	11.8	10.2	100
02/16/09 - 02/22/09	168	8.4	11.7	10.2	100
02/23/09 - 03/01/09	168	9.3	12.2	10.8	100
03/02/09 - 03/08/09	168	6.1	12.7	10.4	100
03/09/09 - 03/15/09	167	9.8	11.8	11.0	100
03/16/09 - 03/22/09	168	8.4	10.5	9.5	100
03/23/09 - 03/29/09	168	6.6	9.7	8.4	100
03/30/09 - 04/05/09	168	7.8	10.3	9.5	100
04/06/09 - 04/12/09	168	7.6	10.8	9.3	100
04/13/09 - 04/19/09	168	6.0	9.7	8.6	100
04/20/09 - 04/26/09	168	4.5	9.6	8.6	100
04/27/09 - 05/03/09	168	5.5	9.2	8.6	100
05/04/09 - 05/10/09	168	7.0	10.5	8.5	100
05/11/09 - 05/17/09	168	5.0	9.6	8.0	100
05/18/09 - 05/24/09	168	6.8	9.0	7.6	100
05/25/09 - 05/31/09	168	3.4	8.3	7.4	99
06/01/09 - 06/07/09	168	5.9	8.0	7.0	100
06/08/09 - 06/14/09	168	5.3	8.2	6.9	100
06/15/09 - 06/21/09	168	5.8	7.7	7.0	100
06/22/09 - 06/28/09	168	6.0	7.3	6.7	100
06/29/09 - 07/05/09	168	4.9	7.7	6.4	100
07/06/09 - 07/12/09	168	4.8	7.1	6.2	100
07/13/09 - 07/19/09	168	5.6	7.4	6.5	100
07/20/09 - 07/26/09	168	4.9	6.9	6.2	100
07/27/09 - 08/02/09	168	5.5	7.2	6.2	100
08/03/09 - 08/09/09	168	4.9	8.0	7.1	100
08/10/09 - 08/16/09	168	5.5	8.5	7.6	100
08/17/09 - 08/23/09	168	4.3	9.1	7.4	100

TABLE A-3 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT ADDISON STREET ON THE
 NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	5.1	8.7	7.3	100
08/31/09 - 09/06/09	168	6.8	7.7	7.4	100
09/07/09 - 09/13/09	168	6.1	7.5	6.8	100
09/14/09 - 09/20/09	168	6.3	7.4	6.8	100
09/21/09 - 09/27/09	36	5.3	7.3	6.6	100
09/28/09 - 10/04/09	133	6.6	8.0	7.4	100
10/05/09 - 10/11/09	168	6.0	8.6	7.3	100
10/12/09 - 10/18/09	168	6.0	8.6	7.9	100
10/19/09 - 10/25/09	168	6.1	8.4	7.3	100
10/26/09 - 11/01/09	168	6.6	9.0	7.8	100
11/02/09 - 11/08/09	168	6.4	9.0	8.0	100
11/09/09 - 11/15/09	168	6.4	8.1	7.2	100
11/16/09 - 11/22/09	168	6.5	8.6	7.4	100
11/23/09 - 11/29/09	168	4.2	8.8	7.4	100
11/30/09 - 12/06/09	168	7.0	8.9	7.9	100
12/07/09 - 12/13/09	168	6.0	10.5	8.8	100
12/14/09 - 12/20/09	168	7.5	9.5	8.7	100
12/21/09 - 12/27/09	168	7.2	11.2	9.4	100
12/28/09 - 12/31/09	96	9.2	11.1	10.2	100

TABLE A-4: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT FULLERTON AVENUE ON THE
 NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	6.1	10.6	9.3	100
01/05/09 - 01/11/09	168	6.1	9.2	7.9	100
01/12/09 - 01/18/09	168	7.5	9.4	8.4	100
01/19/09 - 01/25/09	168	7.3	8.7	7.9	100
01/26/09 - 02/01/09	168	7.8	9.0	8.6	100
02/02/09 - 02/08/09	168	7.4	11.9	9.8	100
02/09/09 - 02/15/09	168	8.3	12.0	10.3	100
02/16/09 - 02/22/09	168	7.6	10.3	9.5	100
02/23/09 - 03/01/09	168	7.1	12.3	10.4	100
03/02/09 - 03/08/09	168	6.0	12.0	9.7	100
03/09/09 - 03/15/09	167	9.0	11.5	10.5	100
03/16/09 - 03/22/09	168	8.2	9.9	9.0	100
03/23/09 - 03/29/09	168	6.0	9.3	7.8	100
03/30/09 - 04/05/09	168	7.7	10.2	9.3	100
04/06/09 - 04/12/09	168	7.3	9.7	8.5	100
04/13/09 - 04/19/09	168	5.2	8.4	7.5	100
04/20/09 - 04/26/09	168	3.2	8.7	7.5	98
04/27/09 - 05/03/09	168	5.2	8.3	7.7	100
05/04/09 - 05/10/09	168	5.2	8.8	7.1	100
05/11/09 - 05/17/09	168	3.9	7.7	6.7	99
05/18/09 - 05/24/09	168	5.8	7.7	6.5	100
05/25/09 - 05/31/09	168	2.9	7.6	6.4	99
06/01/09 - 06/07/09	168	3.3	6.5	5.5	98
06/08/09 - 06/14/09	35	4.6	6.6	5.7	100
06/15/09 - 06/28/09			NO DATA		
06/29/09 - 07/05/09	132	4.1	6.7	5.6	100
07/06/09 - 07/12/09	168	3.9	6.2	5.3	98
07/13/09 - 07/19/09	168	4.9	6.6	5.6	100
07/20/09 - 07/26/09	167	4.1	6.3	5.5	100
07/27/09 - 08/02/09	168	4.7	6.2	5.4	100
08/03/09 - 08/09/09	168	4.6	7.3	6.4	100
08/10/09 - 08/16/09	168	4.9	7.8	7.0	100
08/17/09 - 08/23/09	168	4.2	8.5	6.7	100
08/24/09 - 08/30/09	167	5.0	8.2	7.0	100

TABLE A-4 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT FULLERTON AVENUE ON THE
 NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/31/09 - 09/06/09	168	6.6	7.6	7.1	100
09/07/09 - 09/13/09	167	6.1	7.1	6.5	100
09/14/09 - 09/20/09	168	5.9	6.9	6.4	100
09/21/09 - 09/27/09	168	4.9	6.8	6.2	100
09/28/09 - 10/04/09	168	5.7	7.6	6.7	100
10/05/09 - 10/11/09	168	5.5	7.9	6.9	100
10/12/09 - 10/18/09	168	5.6	8.0	7.4	100
10/19/09 - 10/25/09	168	5.4	7.4	6.3	100
10/26/09 - 11/01/09	168	4.9	8.0	6.7	100
11/02/09 - 11/08/09	168	5.5	8.0	7.1	100
11/09/09 - 11/15/09	168	5.2	7.1	6.4	100
11/16/09 - 11/22/09	35	5.6	6.4	6.0	100
11/23/09 - 11/29/09			NO DATA		
11/30/09 - 12/06/09	132	6.5	8.0	7.4	100
12/07/09 - 12/13/09	168	5.6	10.4	8.5	100
12/14/09 - 12/20/09	168	7.3	9.6	8.6	100
12/21/09 - 12/27/09	168	7.5	12.2	9.8	100
12/28/09 - 12/31/09	96	9.4	12.1	10.9	100

TABLE A-5: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
AT KINZIE STREET ON THE
NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	10.4	11.8	11.2	100
01/05/09 - 01/11/09	168	8.4	11.9	9.3	100
01/12/09 - 01/18/09	168	8.4	12.7	10.3	100
01/19/09 - 01/25/09	168	7.5	11.6	8.8	100
01/26/09 - 02/01/09	168	7.8	13.6	9.4	100
02/02/09 - 02/08/09	168	7.1	11.7	9.1	100
02/09/09 - 02/15/09	168	7.2	11.2	8.6	100
02/16/09 - 02/22/09	168	7.5	9.6	8.5	100
02/23/09 - 03/01/09	168	6.6	11.4	9.6	100
03/02/09 - 03/08/09	168	5.6	11.3	9.7	100
03/09/09 - 03/15/09	167	9.2	11.0	10.3	100
03/16/09 - 03/22/09	36	8.3	9.8	9.0	100
03/23/09 - 03/29/09	133	4.7	8.1	6.2	100
03/30/09 - 04/05/09	168	6.2	9.8	8.7	100
04/06/09 - 04/12/09	168	6.2	8.5	7.3	100
04/13/09 - 04/19/09	168	4.6	7.6	6.2	100
04/20/09 - 04/26/09	168	3.9	7.8	6.6	99
04/27/09 - 05/03/09	168	4.0	7.7	6.7	99
05/04/09 - 05/10/09	168	4.1	7.7	5.9	100
05/11/09 - 05/17/09	168	4.3	7.5	6.2	100
05/18/09 - 05/24/09	168	4.3	7.0	5.6	100
05/25/09 - 05/31/09	168	3.3	7.3	5.7	98
06/01/09 - 06/07/09	168	3.1	6.0	4.7	85
06/08/09 - 06/14/09	35	3.7	5.8	4.7	83
06/15/09 - 06/28/09			NO DATA		
06/29/09 - 07/05/09	133	4.2	5.9	5.0	100
07/06/09 - 07/12/09	168	4.1	6.4	5.0	100
07/13/09 - 07/19/09	168	4.3	6.0	5.2	100
07/20/09 - 07/26/09	168	3.8	6.1	5.0	96
07/27/09 - 08/02/09	168	3.8	5.7	5.0	97
08/03/09 - 08/09/09	168	4.3	6.4	5.4	100
08/10/09 - 08/16/09	168	4.4	7.0	5.7	100
08/17/09 - 08/23/09	168	3.7	7.8	6.2	94
08/24/09 - 08/30/09	168	5.1	7.6	6.6	100

TABLE A-5 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT KINZIE STREET ON THE
 NORTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/31/09 - 09/06/09	168	5.1	7.8	6.6	100
09/07/09 - 09/13/09	168	4.1	6.3	5.2	100
09/14/09 - 09/20/09	168	4.8	6.2	5.5	100
09/21/09 - 09/27/09	168	3.9	6.5	5.5	99
09/28/09 - 10/04/09	168	5.3	6.9	6.2	100
10/05/09 - 10/11/09	168	5.9	7.8	6.8	100
10/12/09 - 10/18/09	168	5.8	8.3	7.2	100
10/19/09 - 10/25/09	168	6.3	9.1	7.3	100
10/26/09 - 11/01/09	168	5.2	8.1	6.6	100
11/02/09 - 11/08/09	168	5.0	8.0	6.6	100
11/09/09 - 11/15/09	168	4.6	6.7	5.5	100
11/16/09 - 11/22/09	168	4.5	7.2	5.6	100
11/23/09 - 11/29/09	168	4.3	7.6	6.1	100
11/30/09 - 12/06/09	168	5.8	7.5	6.8	100
12/07/09 - 12/13/09	168	6.2	10.5	8.6	100
12/14/09 - 12/20/09	168	7.2	9.4	8.3	100
12/21/09 - 12/27/09	168	7.1	11.9	9.3	100
12/28/09 - 12/31/09	96	10.0	11.9	11.2	100

TABLE A-6: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT CLARK STREET ON THE
 CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ (3.5, 5.0) mg/L ¹ IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	7.2	10.9	8.7	100
01/05/09 - 01/11/09	168	10.8	13.8	12.8	100
01/12/09 - 01/18/09	168	12.9	14.5	13.9	100
01/19/09 - 01/25/09	168	13.2	14.9	14.3	100
01/26/09 - 02/01/09	168	12.9	15.0	14.5	100
02/02/09 - 02/08/09	168	12.8	14.9	13.9	100
02/09/09 - 02/15/09	168	10.2	13.3	11.8	100
02/16/09 - 02/22/09	168	10.2	12.3	10.6	100
02/23/09 - 03/01/09	168	8.6	12.6	10.6	100
03/02/09 - 03/08/09	168	8.1	13.6	12.1	100
03/09/09 - 03/15/09	167	7.4	9.9	8.4	100
03/16/09 - 03/22/09	168	7.6	10.3	9.1	100
03/23/09 - 03/29/09	168	6.6	10.2	8.6	100
03/30/09 - 04/05/09	168	8.4	10.2	9.4	100
04/06/09 - 04/12/09	168	7.9	10.0	9.0	100
04/13/09 - 04/19/09	168	7.2	10.0	8.8	100
04/20/09 - 04/26/09	168	7.2	10.8	9.5	100
04/27/09 - 05/03/09	168	8.2	11.0	9.5	100
05/04/09 - 05/10/09	168	7.5	9.6	8.6	100
05/11/09 - 05/17/09	168	7.3	9.8	8.9	100
05/18/09 - 05/24/09	168	7.8	10.0	9.1	100
05/25/09 - 05/31/09	35	8.4	9.8	9.2	100
06/01/09 - 06/07/09			NO DATA		
06/08/09 - 06/14/09	134	8.0	10.0	9.3	100
06/15/09 - 06/21/09	168	5.6	9.7	8.4	100
06/22/09 - 06/28/09	168	6.7	10.6	9.2	100
06/29/09 - 07/05/09	168	8.3	11.5	10.2	100
07/06/09 - 07/12/09	168	6.8	9.6	8.6	100
07/13/09 - 07/19/09	167	6.9	9.4	8.2	100
07/20/09 - 07/26/09	168	7.2	9.4	8.4	100
07/27/09 - 08/02/09	168	7.1	8.5	7.8	100
08/03/09 - 08/09/09	168	7.7	10.1	9.0	100
08/10/09 - 08/16/09	168	7.6	10.4	9.0	100
08/17/09 - 08/23/09	168	7.4	10.9	9.2	100

TABLE A-6 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT CLARK STREET ON THE
 CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ (3.5, 5.0) mg/L ¹ IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	7.7	11.0	9.0	100
08/31/09 - 09/06/09	168	7.4	8.4	7.9	100
09/07/09 - 09/13/09	168	7.1	8.6	8.1	100
09/14/09 - 09/20/09	168	7.1	8.6	7.9	100
09/21/09 - 09/27/09	168	6.4	7.4	7.0	100
09/28/09 - 10/04/09	168	6.9	8.0	7.4	100
10/05/09 - 10/11/09	168	7.7	8.7	8.1	100
10/12/09 - 10/18/09	168	8.5	9.6	9.1	100
10/19/09 - 10/25/09	166	7.7	9.8	9.0	100
10/26/09 - 11/01/09	168	6.9	9.1	8.4	100
11/02/09 - 11/08/09	168	7.8	9.2	8.4	100
11/09/09 - 11/15/09	168	7.5	10.0	8.7	100
11/16/09 - 11/22/09	167	8.9	10.7	9.8	100
11/23/09 - 11/29/09	168	7.5	9.9	9.2	100
11/30/09 - 12/06/09	168	8.7	10.1	9.4	100
12/07/09 - 12/13/09	168	9.1	11.2	10.2	100
12/14/09 - 12/20/09	168	10.3	11.5	10.8	100
12/21/09 - 12/27/09	168	10.5	11.8	11.1	100
12/28/09 - 12/31/09	96	11.3	12.7	11.9	100

¹IPCB general use DO standard is 3.5 mg/L, and 5.0 mg/L from March - July.

TABLE A-7: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT LOOMIS STREET ON THE
 SOUTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	11.1	12.4	11.6	100
01/05/09 - 01/11/09	168	10.9	12.5	11.5	100
01/12/09 - 01/18/09	168	11.4	12.9	12.0	100
01/19/09 - 01/25/09	168	10.6	12.7	11.6	100
01/26/09 - 02/01/09	168	11.0	13.0	11.8	100
02/02/09 - 02/08/09	168	8.8	12.1	11.1	100
02/09/09 - 02/15/09	168	8.1	12.5	11.2	100
02/16/09 - 02/22/09	168	8.6	12.2	10.0	100
02/23/09 - 03/01/09	168	6.6	11.1	9.6	100
03/02/09 - 03/08/09	168	5.9	11.4	10.3	100
03/09/09 - 03/15/09	167	8.0	10.1	9.3	100
03/16/09 - 03/22/09	168	6.4	9.3	7.7	100
03/23/09 - 03/29/09	168	5.9	7.7	6.6	100
03/30/09 - 04/05/09	168	6.5	8.9	8.0	100
04/06/09 - 04/12/09	168	7.1	8.4	7.8	100
04/13/09 - 04/19/09	168	5.7	7.2	6.6	100
04/20/09 - 04/26/09	168	4.9	8.0	6.7	100
04/27/09 - 05/03/09	167	3.7	9.2	6.5	99
05/04/09 - 05/10/09	168	4.3	6.7	5.6	100
05/11/09 - 05/17/09	168	4.3	8.6	6.1	100
05/18/09 - 05/24/09	82	4.9	6.3	5.7	100
05/25/09 - 05/31/09	134	5.3	7.1	6.3	100
06/01/09 - 06/07/09	168	5.3	7.1	6.4	100
06/08/09 - 06/14/09	168	5.0	7.3	6.2	100
06/15/09 - 06/21/09	168	2.9	6.4	5.1	87
06/22/09 - 06/28/09	168	3.8	7.0	5.4	99
06/29/09 - 07/05/09	168	5.4	8.4	7.1	100
07/06/09 - 07/12/09	167	5.0	7.4	6.6	100
07/13/09 - 07/19/09	168	5.0	7.1	5.6	100
07/20/09 - 07/26/09	168	5.5	7.2	6.3	100
07/27/09 - 08/02/09	168	5.1	6.7	5.8	100
08/03/09 - 08/09/09	168	5.5	7.2	6.6	100
08/10/09 - 08/16/09	167	5.6	7.7	6.7	100
08/17/09 - 08/23/09	81	4.3	6.8	5.8	100

TABLE A-7 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT LOOMIS STREET ON THE
 SOUTH BRANCH CHICAGO RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	86	5.4	8.0	6.7	100
08/31/09 - 09/06/09	168	6.3	7.8	7.0	100
09/07/09 - 09/13/09	168	6.3	7.2	6.7	100
09/14/09 - 09/20/09	168	5.8	8.1	6.4	100
09/21/09 - 09/27/09	168	4.8	6.7	5.9	100
09/28/09 - 10/04/09	168	5.9	7.8	6.6	100
10/05/09 - 10/11/09	134	6.2	7.2	6.9	100
10/12/09 - 10/18/09	134	7.0	8.2	7.9	100
10/19/09 - 10/25/09	168	5.3	7.8	7.0	100
10/26/09 - 11/01/09	168	4.0	7.7	6.2	99
11/02/09 - 11/08/09	168	6.0	9.7	6.8	100
11/09/09 - 11/15/09	167	5.9	7.3	6.4	100
11/16/09 - 11/22/09	168	6.0	7.2	6.7	100
11/23/09 - 11/29/09	168	5.3	8.6	6.6	100
11/30/09 - 12/06/09	168	7.1	8.1	7.7	100
12/07/09 - 12/13/09	168	7.6	11.1	8.9	100
12/14/09 - 12/20/09	168	8.6	11.2	9.7	100
12/21/09 - 12/27/09	168	8.0	11.3	9.2	100
12/28/09 - 12/31/09	96	10.3	11.3	11.0	100

TABLE A-8: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT 36TH STREET ON
 BUBBLY CREEK DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	0.2	1.8	0.6	0
01/05/09 - 01/11/09	168	0.0	1.5	0.6	0
01/12/09 - 01/18/09	168	0.0	3.0	1.7	0
01/19/09 - 01/25/09	168	0.2	2.7	1.5	0
01/26/09 - 02/01/09	168	0.0	3.1	1.3	0
02/02/09 - 02/08/09	168	0.0	2.6	0.6	0
02/09/09 - 02/15/09	168	0.0	7.9	2.4	29
02/16/09 - 02/22/09	168	0.0	0.2	0.0	0
02/23/09 - 03/01/09	168	0.0	10.1	2.9	31
03/02/09 - 03/08/09	60	0.2	1.2	0.4	0
03/09/09 - 03/15/09	111	0.1	7.8	1.8	22
03/16/09 - 03/22/09	168	0.1	7.3	0.8	5
03/23/09 - 03/29/09	168	2.9	21.0	10.7	93
03/30/09 - 04/05/09	168	0.0	8.0	2.4	23
04/06/09 - 04/12/09	168	0.0	10.2	2.2	24
04/13/09 - 04/19/09	168	5.0	15.8	9.5	100
04/20/09 - 04/26/09	168	0.4	19.7	9.4	83
04/27/09 - 05/03/09	168	0.0	7.9	1.9	22
05/04/09 - 05/10/09	168	0.0	7.5	0.5	2
05/11/09 - 05/17/09	168	0.0	4.8	0.5	3
05/18/09 - 05/24/09	169	0.0	10.6	1.9	22
05/25/09 - 05/31/09	167	0.2	12.7	2.7	31
06/01/09 - 06/07/09	168	0.0	14.2	5.3	52
06/08/09 - 06/14/09	168	0.0	6.4	2.0	12
06/15/09 - 06/21/09	57	0.0	3.0	1.1	0
06/22/09 - 06/28/09	109	0.2	5.9	2.3	21
06/29/09 - 07/05/09	168	0.0	6.6	1.0	6
07/06/09 - 07/12/09	168	0.0	3.0	0.2	0
07/13/09 - 07/19/09	57	0.0	0.9	0.0	0
07/20/09 - 07/26/09			NO DATA		
07/27/09 - 08/02/09	111	2.5	11.5	6.4	87
08/03/09 - 08/09/09	168	0.9	13.9	5.8	72
08/10/09 - 08/16/09	168	0.1	9.7	3.0	26
08/17/09 - 08/23/09	168	0.1	10.0	3.6	41

TABLE A-8 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT 36TH STREET ON
 BUBBLY CREEK DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	0.1	7.5	2.3	21
08/31/09 - 09/06/09	168	0.0	11.9	3.1	33
09/07/09 - 09/13/09	168	0.1	8.2	3.4	38
09/14/09 - 09/20/09	168	0.3	9.0	3.9	46
09/21/09 - 09/27/09	167	0.1	5.1	1.8	14
09/28/09 - 10/04/09	168	3.0	7.6	5.4	86
10/05/09 - 10/11/09	168	4.1	8.6	6.3	100
10/12/09 - 10/18/09	168	4.5	6.6	5.7	100
10/19/09 - 10/25/09	168	0.0	8.7	4.4	71
10/26/09 - 11/01/09	168	0.0	7.5	1.1	15
11/02/09 - 11/08/09	168	0.1	2.0	0.6	0
11/09/09 - 11/15/09	168	0.9	7.4	3.7	44
11/16/09 - 11/22/09	168	4.6	8.6	6.5	100
11/23/09 - 11/29/09	168	3.3	7.0	4.7	87
11/30/09 - 12/06/09	168	4.0	7.2	5.6	100
12/07/09 - 12/13/09	168	0.2	7.3	2.7	34
12/14/09 - 12/20/09	168	0.2	4.5	0.8	1
12/21/09 - 12/27/09	34	0.4	2.5	1.1	0
12/28/09 - 12/31/09			NO DATA		

TABLE A-9: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT INTERSTATE HIGHWAY 55 ON
 BUBBLY CREEK DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09			NO DATA		
01/05/09 - 01/11/09	86	6.9	10.0	8.6	100
01/12/09 - 01/18/09	168	7.7	10.3	8.9	100
01/19/09 - 01/25/09	168	7.8	10.9	9.3	100
01/26/09 - 02/01/09	168	6.0	10.6	8.1	100
02/02/09 - 02/08/09	168	4.5	8.8	7.2	100
02/09/09 - 02/15/09	168	0.1	8.7	4.0	58
02/16/09 - 02/22/09	168	0.0	7.8	1.5	5
02/23/09 - 03/01/09	168	1.9	9.4	5.7	62
03/02/09 - 03/08/09	82	2.4	5.1	3.9	54
03/09/09 - 03/15/09	85	1.6	7.2	5.1	84
03/16/09 - 03/22/09	168	0.5	6.8	3.9	58
03/23/09 - 03/29/09	168	0.9	12.6	4.0	51
03/30/09 - 04/05/09	168	0.0	6.6	3.6	57
04/06/09 - 04/12/09	168	0.1	7.7	5.7	86
04/13/09 - 04/19/09	168	4.0	7.4	5.6	100
04/20/09 - 04/26/09	167	0.4	9.6	4.0	45
04/27/09 - 05/03/09	82	0.8	6.5	2.6	17
05/04/09 - 05/10/09	134	0.3	7.9	2.3	23
05/11/09 - 05/17/09	168	0.1	4.7	1.2	3
05/18/09 - 05/24/09	168	0.2	5.6	1.5	9
05/25/09 - 05/31/09	168	0.0	9.9	2.1	14
06/01/09 - 06/07/09	168	0.0	6.3	2.6	38
06/08/09 - 06/14/09	168	0.8	8.9	4.1	43
06/15/09 - 06/21/09	168	0.1	5.9	1.3	2
06/22/09 - 06/28/09	168	0.2	6.0	0.8	2
06/29/09 - 07/05/09	168	0.1	8.1	2.7	31
07/06/09 - 07/12/09	168	0.2	6.7	2.9	24
07/13/09 - 07/19/09	168	0.0	2.6	0.7	0
07/20/09 - 07/26/09	168	0.0	5.4	2.7	17
07/27/09 - 08/02/09	168	1.4	5.6	3.4	24
08/03/09 - 08/09/09	168	2.0	11.4	5.1	72
08/10/09 - 08/16/09	168	1.8	10.7	5.5	68
08/17/09 - 08/23/09	168	1.8	7.9	4.7	64

TABLE A-9 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT INTERSTATE HIGHWAY 55 ON
 BUBBLY CREEK DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	0.1	9.7	3.9	49
08/31/09 - 09/06/09	168	0.0	8.6	3.8	50
09/07/09 - 09/13/09	168	2.1	7.0	4.5	66
09/14/09 - 09/20/09	168	1.8	5.5	3.8	47
09/21/09 - 09/27/09	168	1.2	4.9	3.5	25
09/28/09 - 10/04/09	168	2.5	6.1	4.6	80
10/05/09 - 10/11/09	168	4.4	6.8	5.9	100
10/12/09 - 10/18/09	168	5.9	7.7	7.0	100
10/19/09 - 10/25/09	168	0.0	8.4	4.7	70
10/26/09 - 11/01/09	168	0.0	7.4	2.2	21
11/02/09 - 11/08/09	168	0.3	5.6	3.6	52
11/09/09 - 11/15/09	168	3.2	6.5	5.1	93
11/16/09 - 11/22/09	168	5.4	7.1	6.2	100
11/23/09 - 11/29/09	168	4.6	6.8	5.5	100
11/30/09 - 12/06/09	168	4.8	7.6	6.7	100
12/07/09 - 12/13/09	168	4.6	8.0	6.5	100
12/14/09 - 12/20/09	83	6.8	9.5	8.7	100
12/21/09 - 12/31/09			NO DATA		

TABLE A-10: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
AT CICERO AVENUE ON THE
CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09		NO DATA			
01/05/09 - 01/11/09	87	9.6	10.6	10.2	100
01/12/09 - 01/18/09	168	9.9	11.5	10.9	100
01/19/09 - 01/25/09	168	10.3	12.0	10.9	100
01/26/09 - 02/01/09	168	9.9	11.3	10.5	100
02/02/09 - 02/08/09	167	9.4	10.9	10.2	100
02/09/09 - 02/15/09	168	7.4	10.5	9.5	100
02/16/09 - 02/22/09	168	8.3	10.4	9.1	100
02/23/09 - 03/01/09	168	6.7	10.4	8.4	100
03/02/09 - 03/08/09	168	7.3	10.6	9.6	100
03/09/09 - 03/15/09	167	6.6	9.9	8.4	100
03/16/09 - 03/22/09	168	4.6	9.1	7.2	100
03/23/09 - 03/29/09	168	4.9	8.0	6.3	100
03/30/09 - 04/05/09	168	5.0	8.7	7.1	100
04/06/09 - 04/12/09	168	5.5	8.1	7.0	100
04/13/09 - 04/19/09	168	3.7	6.5	5.1	98
04/20/09 - 04/26/09	168	4.3	6.9	5.7	100
04/27/09 - 05/03/09	168	2.0	7.4	4.9	77
05/04/09 - 05/10/09	168	2.3	6.1	4.0	47
05/11/09 - 05/17/09	168	0.7	5.6	3.6	46
05/18/09 - 05/24/09	168	2.8	6.8	4.5	68
05/25/09 - 05/31/09	33	2.4	3.6	3.1	0
06/01/09 - 06/07/09	85	3.9	5.9	5.1	95
06/08/09 - 06/14/09	33	4.1	5.8	5.2	100
06/15/09 - 06/21/09	60	1.8	4.3	2.8	3
06/22/09 - 06/28/09	168	1.9	5.4	3.6	32
06/29/09 - 07/05/09	168	3.0	7.4	5.4	77
07/06/09 - 07/12/09	168	1.8	6.8	5.3	86
07/13/09 - 07/19/09	168	2.6	4.9	3.7	30
07/20/09 - 07/26/09	168	3.4	5.4	4.5	83
07/27/09 - 08/02/09	168	1.3	6.5	3.9	57
08/03/09 - 08/09/09	168	4.3	7.0	5.4	100
08/10/09 - 08/16/09	168	3.4	6.9	5.4	96
08/17/09 - 08/23/09	166	3.3	7.1	5.7	92

TABLE A-10 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT CICERO AVENUE ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	1.7	7.9	6.4	97
08/31/09 - 09/06/09	168	5.7	8.2	6.6	100
09/07/09 - 09/13/09	58	5.5	7.5	6.3	100
09/14/09 - 09/20/09	135	4.2	5.5	4.9	100
09/21/09 - 09/27/09	168	2.8	5.4	4.6	89
09/28/09 - 10/04/09	168	4.9	6.6	5.7	100
10/05/09 - 10/11/09	167	5.4	7.2	6.1	100
10/12/09 - 10/18/09	168	5.6	7.3	6.5	100
10/19/09 - 10/25/09	168	3.4	7.1	5.6	90
10/26/09 - 11/01/09	168	0.8	6.2	4.4	68
11/02/09 - 11/08/09	87	1.4	4.6	3.6	38
11/09/09 - 11/15/09	135	3.6	5.2	4.3	76
11/16/09 - 11/22/09	168	3.9	6.4	5.1	99
11/23/09 - 11/29/09	168	3.9	6.1	5.0	98
11/30/09 - 12/06/09	168	4.4	7.0	5.8	100
12/07/09 - 12/13/09	168	5.5	8.8	7.1	100
12/14/09 - 12/20/09	168	6.6	10.1	8.0	100
12/21/09 - 12/27/09	168	7.0	10.5	8.1	100
12/28/09 - 12/31/09	96	9.1	10.6	9.9	100

TABLE A-11: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT B&O CENTRAL RAILROAD ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	9.9	10.6	10.3	100
01/05/09 - 01/11/09	57	9.1	10.3	9.6	100
01/12/09 - 01/18/09		NO DATA			
01/19/09 - 01/25/09	86	8.6	9.7	9.2	100
01/26/09 - 02/01/09	168	9.0	9.9	9.4	100
02/02/09 - 02/08/09	168	7.5	9.9	9.0	100
02/09/09 - 02/15/09	168	7.4	9.4	8.6	100
02/16/09 - 02/22/09	168	8.2	9.9	9.1	100
02/23/09 - 03/01/09	168	7.1	10.1	8.9	100
03/02/09 - 03/08/09	168	8.8	10.6	9.7	100
03/09/09 - 03/15/09	167	8.2	10.1	9.4	100
03/16/09 - 03/22/09	168	7.8	10.2	8.7	100
03/23/09 - 03/29/09	168	6.6	8.8	7.7	100
03/30/09 - 04/05/09	57	6.0	8.7	7.8	100
04/06/09 - 04/12/09	110	7.3	9.3	8.5	100
04/13/09 - 04/19/09	168	6.4	9.2	7.8	100
04/20/09 - 04/26/09	168	6.5	9.4	7.8	100
04/27/09 - 05/03/09	168	3.1	8.9	6.9	98
05/04/09 - 05/10/09	168	4.8	8.0	6.9	100
05/11/09 - 05/17/09	167	4.4	8.3	6.4	100
05/18/09 - 05/24/09	168	5.4	8.7	6.8	100
05/25/09 - 05/31/09	168	3.0	7.5	5.2	90
06/01/09 - 06/07/09	168	2.8	6.5	5.2	97
06/08/09 - 06/14/09	168	4.7	7.0	6.0	100
06/15/09 - 06/21/09	168	2.4	6.5	4.9	71
06/22/09 - 06/28/09	168	3.5	6.0	4.8	92
06/29/09 - 07/05/09	168	3.8	6.7	5.5	97
07/06/09 - 07/12/09	168	4.3	6.2	5.5	100
07/13/09 - 07/19/09	168	3.8	5.6	4.8	95
07/20/09 - 07/26/09	167	4.4	6.0	5.2	100
07/27/09 - 08/02/09	168	4.6	6.3	5.1	100
08/03/09 - 08/09/09	168	4.6	6.6	5.5	100
08/10/09 - 08/16/09	168	4.6	7.2	5.8	100
08/17/09 - 08/23/09	168	4.7	7.0	6.0	100

TABLE A-11 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT B&O CENTRAL RAILROAD ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	2.9	7.2	6.4	98
08/31/09 - 09/06/09	168	5.9	7.5	6.5	100
09/07/09 - 09/13/09	81	5.6	6.8	6.1	100
09/14/09 - 09/20/09	102	6.4	7.3	6.9	100
09/21/09 - 09/27/09	168	4.5	8.2	5.8	100
09/28/09 - 10/04/09	57	5.3	6.2	5.7	100
10/05/09 - 10/11/09	110	5.8	7.2	6.4	100
10/12/09 - 10/18/09	168	6.0	7.5	6.8	100
10/19/09 - 10/25/09	168	4.3	7.2	6.2	100
10/26/09 - 11/01/09	168	3.8	7.2	5.8	99
11/02/09 - 11/08/09	168	4.1	7.7	6.3	100
11/09/09 - 11/15/09	168	5.4	7.3	6.0	100
11/16/09 - 11/22/09	167	5.7	7.5	6.5	100
11/23/09 - 11/29/09	168	5.7	8.2	6.7	100
11/30/09 - 12/06/09	168	6.1	8.2	7.0	100
12/07/09 - 12/13/09	168	6.7	9.4	8.1	100
12/14/09 - 12/20/09	168	7.3	9.3	8.2	100
12/21/09 - 12/27/09	168	7.6	9.8	8.4	100
12/28/09 - 12/31/09	96	8.5	9.8	9.3	100

TABLE A-12: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT ROUTE 83 ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/18/09			NO DATA		
01/19/09 - 01/25/09	85	8.1	9.1	8.5	100
01/26/09 - 02/01/09	168	8.7	9.7	9.2	100
02/02/09 - 02/08/09	168	7.6	9.6	9.0	100
02/09/09 - 02/15/09	168	7.4	9.5	8.8	100
02/16/09 - 02/22/09	168	7.6	9.2	8.7	100
02/23/09 - 03/01/09	168	5.5	9.1	7.9	100
03/02/09 - 03/08/09	59	8.9	10.0	9.6	100
03/09/09 - 03/29/09			NO DATA		
03/30/09 - 04/05/09	109	4.8	8.6	7.5	100
04/06/09 - 04/12/09	168	6.9	9.9	7.9	100
04/13/09 - 04/19/09	59	6.1	7.7	6.9	100
04/20/09 - 04/26/09			NO DATA		
04/27/09 - 05/03/09	108	4.1	8.0	5.7	100
05/04/09 - 05/10/09	168	3.6	6.7	5.4	92
05/11/09 - 05/17/09	167	4.0	6.7	5.3	99
05/18/09 - 05/24/09	59	4.8	6.0	5.3	100
05/25/09 - 06/07/09			NO DATA		
06/08/09 - 06/14/09	110	3.5	5.7	4.9	94
06/15/09 - 06/21/09	168	1.3	5.4	3.7	53
06/22/09 - 06/28/09	168	3.0	5.1	4.1	49
06/29/09 - 07/05/09	168	3.3	5.7	4.4	74
07/06/09 - 07/12/09	168	2.3	5.6	4.3	72
07/13/09 - 07/19/09	168	2.4	4.4	3.5	15
07/20/09 - 07/26/09	168	3.3	5.2	4.2	76
07/27/09 - 08/02/09	168	3.7	7.0	4.9	96
08/03/09 - 08/09/09	168	1.8	5.1	3.9	49
08/10/09 - 08/16/09	168	3.7	6.4	5.1	98
08/17/09 - 08/23/09	168	3.2	5.8	4.7	83
08/24/09 - 08/30/09	168	0.8	5.7	4.3	75
08/31/09 - 09/06/09	168	3.7	7.3	5.7	98
09/07/09 - 09/13/09	168	3.6	6.3	5.1	98
09/14/09 - 09/20/09	168	2.4	5.1	3.7	40
09/21/09 - 09/27/09	168	1.6	5.4	4.2	67

TABLE A-12 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT ROUTE 83 ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
09/28/09 - 10/04/09	168	4.5	6.1	5.4	100
10/05/09 - 10/11/09	168	3.8	6.3	5.2	98
10/12/09 - 10/18/09	168	5.3	6.7	5.8	100
10/19/09 - 10/25/09	168	2.4	6.3	5.4	86
10/26/09 - 11/01/09	168	2.2	6.4	4.3	63
11/02/09 - 11/08/09	168	3.5	6.6	5.2	86
11/09/09 - 11/15/09	168	4.0	6.3	4.9	99
11/16/09 - 11/22/09	168	4.7	6.4	5.6	100
11/23/09 - 11/29/09	168	4.8	7.2	5.5	100
11/30/09 - 12/06/09	168	4.2	7.0	6.1	100
12/07/09 - 12/13/09	168	6.3	9.1	7.7	100
12/14/09 - 12/20/09	168	6.1	8.2	7.2	100
12/21/09 - 12/27/09	168	6.2	8.7	7.2	100
12/28/09 - 12/31/09	96	7.7	8.9	8.4	100

TABLE A-13: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT LOCKPORT POWERHOUSE ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	10.9	11.9	11.6	100
01/05/09 - 01/11/09	168	7.6	11.8	8.4	100
01/12/09 - 01/18/09	168	7.0	9.5	8.7	100
01/19/09 - 01/25/09	168	7.9	10.1	9.2	100
01/26/09 - 02/01/09	168	7.8	9.6	9.0	100
02/02/09 - 02/08/09	168	8.3	9.4	8.8	100
02/09/09 - 02/15/09	168	7.8	9.2	8.5	100
02/16/09 - 02/22/09	168	8.4	9.2	8.8	100
02/23/09 - 03/01/09	168	5.3	9.4	8.4	100
03/02/09 - 03/08/09	165	7.1	9.8	8.9	100
03/09/09 - 03/15/09	167	7.5	9.0	8.4	100
03/16/09 - 03/22/09	168	7.0	9.1	7.8	100
03/23/09 - 03/29/09	168	6.2	8.7	7.2	100
03/30/09 - 04/05/09	168	6.8	9.1	8.2	100
04/06/09 - 04/12/09	168	7.6	9.3	8.3	100
04/13/09 - 04/19/09	168	6.2	8.4	7.4	100
04/20/09 - 04/26/09	168	6.0	7.7	6.7	100
04/27/09 - 05/03/09	168	4.0	6.7	5.4	98
05/04/09 - 05/10/09	168	3.8	6.2	5.3	95
05/11/09 - 05/17/09	168	4.3	6.5	5.3	100
05/18/09 - 05/24/09	168	4.3	5.7	5.0	100
05/25/09 - 05/31/09	168	2.3	5.3	4.2	79
06/01/09 - 06/07/09	168	3.3	4.8	4.1	65
06/08/09 - 06/14/09	167	3.4	4.7	4.2	73
06/15/09 - 06/21/09	11	4.2	4.4	4.3	100
06/22/09 - 06/28/09			NO DATA		
06/29/09 - 07/05/09	158	2.8	4.4	3.8	34
07/06/09 - 07/12/09	168	3.4	5.1	4.3	76
07/13/09 - 07/19/09	10	3.0	3.8	3.6	0
07/20/09 - 07/26/09	157	3.3	5.1	3.9	41
07/27/09 - 08/02/09	11	3.3	4.1	3.6	9
08/03/09 - 08/09/09	155	3.6	6.5	4.6	87
08/10/09 - 08/16/09	168	3.5	7.2	5.1	92
08/17/09 - 08/23/09	167	3.5	6.6	4.9	87

TABLE A-13 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT LOCKPORT POWERHOUSE ON THE
 CHICAGO SANITARY AND SHIP CANAL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	3.5	5.8	4.8	90
08/31/09 - 09/06/09	168	4.6	7.2	5.9	100
09/07/09 - 09/13/09	168	4.5	7.1	5.6	100
09/14/09 - 09/20/09	168	4.7	7.3	6.4	100
09/21/09 - 09/27/09	11	6.1	6.5	6.3	100
09/28/09 - 10/04/09	156	4.2	6.0	5.3	100
10/05/09 - 10/11/09	168	5.1	6.1	5.7	100
10/12/09 - 10/18/09	168	5.0	6.4	5.9	100
10/19/09 - 10/25/09	168	2.5	6.6	5.6	90
10/26/09 - 11/01/09	168	2.5	6.5	4.5	71
11/02/09 - 11/08/09	168	3.7	7.2	5.8	93
11/09/09 - 11/15/09	168	4.3	6.4	5.1	100
11/16/09 - 11/22/09	168	4.7	5.6	5.2	100
11/23/09 - 11/29/09	168	4.8	6.2	5.4	100
11/30/09 - 12/06/09	168	5.3	6.7	6.1	100
12/07/09 - 12/13/09	168	5.9	8.6	7.1	100
12/14/09 - 12/20/09	168	7.6	8.5	8.0	100
12/21/09 - 12/27/09	168	6.7	9.6	8.0	100
12/28/09 - 12/31/09	96	9.1	9.8	9.3	100

TABLE A-14: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT JEFFERSON STREET ON THE
 DES PLAINES RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	10.2	12.2	11.1	100
01/05/09 - 01/11/09	168	9.5	12.3	10.7	100
01/12/09 - 01/18/09	168	7.9	11.6	10.2	100
01/19/09 - 01/25/09	168	9.0	11.6	10.2	100
01/26/09 - 02/01/09	168	8.7	10.4	9.6	100
02/02/09 - 02/08/09	168	9.1	11.2	10.0	100
02/09/09 - 02/15/09	168	8.8	11.5	10.1	100
02/16/09 - 02/22/09	168	9.1	11.7	10.5	100
02/23/09 - 03/01/09	168	8.2	11.8	10.3	100
03/02/09 - 03/08/09	168	8.3	11.9	10.3	100
03/09/09 - 03/15/09	167	8.6	11.2	10.0	100
03/16/09 - 03/22/09	83	8.7	10.0	9.4	100
03/23/09 - 03/29/09	86	7.4	9.8	8.5	100
03/30/09 - 04/05/09	168	6.9	10.6	8.5	100
04/06/09 - 04/12/09	168	8.2	12.4	9.8	100
04/13/09 - 04/19/09	168	7.3	11.2	8.8	100
04/20/09 - 04/26/09	168	6.5	10.1	7.8	100
04/27/09 - 05/03/09	168	4.9	9.2	7.1	100
05/04/09 - 05/10/09	168	5.0	8.1	6.9	100
05/11/09 - 05/17/09	168	5.1	8.6	7.0	100
05/18/09 - 05/24/09	168	5.2	10.1	6.9	100
05/25/09 - 05/31/09	168	3.3	8.8	5.6	91
06/01/09 - 06/07/09	168	4.3	10.4	6.2	100
06/08/09 - 06/14/09	168	4.4	8.1	5.6	100
06/15/09 - 06/21/09	168	2.0	7.3	5.4	93
06/22/09 - 06/28/09	168	3.1	6.1	4.6	74
06/29/09 - 07/05/09	168	4.2	5.9	5.1	100
07/06/09 - 07/12/09	168	4.2	7.7	5.2	100
07/13/09 - 07/19/09	83	3.8	7.1	5.1	99
07/20/09 - 07/26/09			NO DATA		
07/27/09 - 08/02/09	85	4.5	6.8	5.3	100
08/03/09 - 08/09/09	168	4.1	6.5	5.1	100
08/10/09 - 08/16/09	168	4.3	7.1	5.7	100
08/17/09 - 08/23/09	168	4.5	7.2	6.1	100

TABLE A-14 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT JEFFERSON STREET ON THE
 DES PLAINES RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	4.7	7.5	6.1	100
08/31/09 - 09/06/09	168	5.2	10.5	6.5	100
09/07/09 - 09/13/09	168	4.6	9.9	6.4	100
09/14/09 - 09/20/09	168	4.6	6.9	5.8	100
09/21/09 - 09/27/09	168	4.4	6.2	5.4	100
09/28/09 - 10/04/09	168	4.6	7.0	5.9	100
10/05/09 - 10/11/09	168	6.0	7.8	6.7	100
10/12/09 - 10/18/09	168	6.1	8.1	7.0	100
10/19/09 - 10/25/09	168	5.0	8.9	7.4	100
10/26/09 - 11/01/09	168	4.8	9.3	7.3	100
11/02/09 - 11/08/09	168	6.5	8.8	7.7	100
11/09/09 - 11/15/09	168	5.9	8.6	7.1	100
11/16/09 - 11/22/09	168	6.3	8.5	7.0	100
11/23/09 - 11/29/09	168	6.2	8.7	7.3	100
11/30/09 - 12/06/09	168	7.5	12.1	9.0	100
12/07/09 - 12/13/09	83	7.6	11.7	9.2	100
12/14/09 - 12/20/09			NO DATA		
12/21/09 - 12/27/09	109	8.5	11.6	10.4	100
12/28/09 - 12/31/09	96	10.1	11.4	10.5	100

TABLE A-15: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT C&W INDIANA RAILROAD ON THE
 LITTLE CALUMET RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	9.5	11.3	10.5	100
01/05/09 - 01/11/09	168	9.5	10.5	10.1	100
01/12/09 - 01/18/09	168	8.9	9.9	9.4	100
01/19/09 - 01/25/09	168	8.7	11.2	10.2	100
01/26/09 - 02/01/09	168	8.0	11.0	9.3	100
02/02/09 - 02/08/09	168	6.7	9.3	8.0	100
02/09/09 - 02/15/09	168	7.7	11.3	9.8	100
02/16/09 - 02/22/09	168	10.3	11.7	11.0	100
02/23/09 - 03/01/09	168	10.6	12.2	11.6	100
03/02/09 - 03/08/09	168	8.8	12.4	11.6	100
03/09/09 - 03/15/09	168	7.9	10.6	9.5	100
03/16/09 - 03/22/09	168	7.9	16.9	11.2	100
03/23/09 - 03/29/09	168	11.1	18.8	15.2	100
03/30/09 - 04/05/09	168	10.1	15.9	12.6	100
04/06/09 - 04/12/09	168	9.5	17.8	13.4	100
04/13/09 - 04/19/09	168	11.0	15.9	13.3	100
04/20/09 - 04/26/09	168	7.5	14.1	11.3	100
04/27/09 - 05/03/09	168	3.1	11.8	6.5	97
05/04/09 - 05/10/09	168	2.3	8.0	5.0	74
05/11/09 - 05/17/09	168	0.7	7.5	3.6	40
05/18/09 - 05/24/09	168	0.8	10.0	3.8	39
05/25/09 - 05/31/09	168	0.6	7.2	3.2	30
06/01/09 - 06/07/09	168	0.7	5.2	2.4	9
06/08/09 - 06/14/09	60	0.3	3.5	1.7	0
06/15/09 - 06/21/09			NO DATA		
06/22/09 - 06/28/09	108	1.2	7.6	3.9	45
06/29/09 - 07/05/09	168	0.9	6.9	4.3	67
07/06/09 - 07/12/09	168	4.3	7.6	6.1	100
07/13/09 - 07/19/09	168	4.5	8.7	6.6	100
07/20/09 - 07/26/09	168	4.7	8.5	6.4	100
07/27/09 - 08/02/09	168	5.2	10.1	7.3	100
08/03/09 - 08/09/09	168	5.4	9.0	6.8	100
08/10/09 - 08/16/09	168	5.9	10.8	8.2	100
08/17/09 - 08/23/09	168	5.2	9.2	6.9	100

TABLE A-15 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT C&W INDIANA RAILROAD ON THE
 LITTLE CALUMET RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	5.8	8.0	6.9	100
08/31/09 - 09/06/09	168	6.2	9.1	7.3	100
09/07/09 - 09/13/09	168	5.8	9.1	7.3	100
09/14/09 - 09/20/09	168	5.9	8.3	6.9	100
09/21/09 - 09/27/09	168	5.8	7.1	6.5	100
09/28/09 - 10/04/09	168	6.6	8.2	7.4	100
10/05/09 - 10/11/09	168	7.2	8.5	7.9	100
10/12/09 - 10/18/09	168	7.8	8.9	8.2	100
10/19/09 - 10/25/09	168	7.5	9.7	8.5	100
10/26/09 - 11/01/09	168	4.9	8.3	6.8	100
11/02/09 - 11/08/09	168	6.2	8.1	7.3	100
11/09/09 - 11/15/09	168	5.5	7.9	7.0	100
11/16/09 - 11/22/09	168	6.3	9.5	8.2	100
11/23/09 - 11/29/09	168	7.4	9.8	8.7	100
11/30/09 - 12/06/09	168	8.5	11.8	9.9	100
12/07/09 - 12/13/09	168	9.0	12.4	11.4	100
12/14/09 - 12/20/09	168	10.4	14.8	12.7	100
12/21/09 - 12/27/09	168	9.8	14.1	12.6	100
12/28/09 - 12/31/09	96	10.0	13.1	11.9	100

TABLE A-16: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT HALSTED STREET ON THE
 LITTLE CALUMET RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	7.4	9.5	8.5	100
01/05/09 - 01/11/09	168	6.8	9.2	8.2	100
01/12/09 - 01/18/09	168	8.0	10.4	9.1	100
01/19/09 - 01/25/09	168	8.2	9.6	9.0	100
01/26/09 - 02/01/09	168	8.2	10.0	8.9	100
02/02/09 - 02/08/09	168	7.0	9.4	8.3	100
02/09/09 - 02/15/09	167	6.8	8.5	7.8	100
02/16/09 - 02/22/09	168	6.5	8.5	7.4	100
02/23/09 - 03/01/09	168	7.3	8.7	8.0	100
03/02/09 - 03/08/09	168	6.5	10.2	7.9	100
03/09/09 - 03/15/09	167	5.8	9.3	7.8	100
03/16/09 - 03/22/09	168	6.0	9.1	7.2	100
03/23/09 - 03/29/09	168	6.5	11.8	8.6	100
03/30/09 - 04/05/09	168	6.8	10.7	8.2	100
04/06/09 - 04/12/09	168	7.1	10.8	8.4	100
04/13/09 - 04/19/09	168	6.7	10.0	8.2	100
04/20/09 - 04/26/09	168	6.2	10.2	7.6	100
04/27/09 - 05/03/09	168	5.5	10.7	7.0	100
05/04/09 - 05/10/09	168	3.9	9.0	6.2	99
05/11/09 - 05/17/09	168	4.1	8.6	5.9	100
05/18/09 - 05/24/09	168	3.5	11.0	5.8	98
05/25/09 - 05/31/09	168	3.7	8.7	5.4	96
06/01/09 - 06/07/09	168	2.1	6.9	4.4	71
06/08/09 - 06/14/09	168	3.0	7.5	4.9	92
06/15/09 - 06/21/09	168	3.1	7.8	4.8	92
06/22/09 - 06/28/09	168	1.8	7.0	5.2	95
06/29/09 - 07/05/09	168	4.1	7.1	5.5	100
07/06/09 - 07/12/09	168	3.8	7.3	5.8	99
07/13/09 - 07/19/09	168	3.6	9.1	6.0	99
07/20/09 - 07/26/09	168	3.1	9.2	5.7	97
07/27/09 - 08/02/09	168	2.0	9.0	5.8	90
08/03/09 - 08/09/09	168	4.6	8.4	6.2	100
08/10/09 - 08/16/09	168	4.5	10.8	7.3	100
08/17/09 - 08/23/09	168	4.2	8.9	6.0	100

TABLE A-16 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT HALSTED STREET ON THE
 LITTLE CALUMET RIVER DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	4.6	7.4	6.1	100
08/31/09 - 09/06/09	168	5.8	8.0	6.9	100
09/07/09 - 09/13/09	168	5.8	8.0	6.8	100
09/14/09 - 09/20/09	168	5.8	7.8	6.7	100
09/21/09 - 09/27/09	168	5.3	7.1	6.2	100
09/28/09 - 10/04/09	168	5.7	7.6	6.9	100
10/05/09 - 10/11/09	168	6.3	7.6	7.1	100
10/12/09 - 10/18/09	168	6.8	8.3	7.5	100
10/19/09 - 10/25/09	168	4.5	8.1	6.6	100
10/26/09 - 11/01/09	168	2.1	7.1	5.2	78
11/02/09 - 11/08/09	168	4.7	6.5	5.8	100
11/09/09 - 11/15/09	168	4.2	6.9	6.0	100
11/16/09 - 11/22/09	168	4.2	7.2	5.7	100
11/23/09 - 11/29/09	168	4.4	6.4	5.5	100
11/30/09 - 12/06/09	167	4.3	6.8	5.6	100
12/07/09 - 12/13/09	168	5.1	7.6	6.8	100
12/14/09 - 12/20/09	168	5.0	7.3	6.4	100
12/21/09 - 12/27/09	168	5.6	9.3	7.7	100
12/28/09 - 12/31/09	96	6.1	8.7	7.1	100

TABLE A-17: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT CICERO AVENUE ON THE
 CALUMET-SAG CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	8.8	10.6	9.8	100
01/05/09 - 01/11/09	168	7.6	9.1	8.3	100
01/12/09 - 01/18/09	168	8.0	8.8	8.3	100
01/19/09 - 01/25/09	168	7.9	9.0	8.5	100
01/26/09 - 02/01/09	168	8.2	8.9	8.5	100
02/02/09 - 02/08/09	168	7.7	9.0	8.4	100
02/09/09 - 02/15/09	168	7.8	10.3	9.2	100
02/16/09 - 02/22/09	168	7.8	10.2	9.2	100
02/23/09 - 03/01/09	168	8.1	10.5	9.6	100
03/02/09 - 03/08/09	168	8.0	11.6	9.2	100
03/09/09 - 03/15/09	167	8.1	10.6	9.2	100
03/16/09 - 03/22/09	168	5.3	8.0	6.3	100
03/23/09 - 03/29/09	168	6.0	11.3	8.1	100
03/30/09 - 04/05/09	168	7.7	10.4	8.8	100
04/06/09 - 04/12/09	168	8.1	10.5	8.9	100
04/13/09 - 04/19/09	168	7.2	9.4	8.3	100
04/20/09 - 04/26/09	167	5.8	8.2	7.2	100
04/27/09 - 05/03/09	168	4.8	8.1	6.6	100
05/04/09 - 05/10/09	167	5.1	7.1	6.2	100
05/11/09 - 05/17/09	168	4.8	7.3	6.0	100
05/18/09 - 05/24/09	168	3.8	6.8	5.6	100
05/25/09 - 05/31/09	168	3.9	6.4	5.1	100
06/01/09 - 06/07/09	168	3.8	6.1	4.8	100
06/08/09 - 06/14/09	168	3.6	5.9	5.0	100
06/15/09 - 06/21/09	168	4.2	5.8	4.9	100
06/22/09 - 06/28/09	168	2.9	6.2	4.8	99
06/29/09 - 07/05/09	168	4.8	6.4	5.6	100
07/06/09 - 07/12/09	59	5.0	6.2	5.6	100
07/13/09 - 07/19/09	109	4.7	9.2	6.3	100
07/20/09 - 07/26/09	168	4.2	8.3	6.0	100
07/27/09 - 08/02/09	168	3.4	7.1	5.6	100
08/03/09 - 08/09/09	60	4.3	6.6	5.5	100
08/10/09 - 08/16/09			NO DATA		
08/17/09 - 08/23/09	109	4.7	6.4	5.6	100

TABLE A-17 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT CICERO AVENUE ON THE
 CALUMET-SAG CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/24/09 - 08/30/09	168	5.3	6.9	5.9	100
08/31/09 - 09/06/09	168	5.1	7.2	6.2	100
09/07/09 - 09/13/09	168	5.7	7.3	6.3	100
09/14/09 - 09/20/09	168	5.5	7.2	6.2	100
09/21/09 - 09/27/09	168	5.0	6.6	6.0	100
09/28/09 - 10/04/09	168	5.7	7.1	6.4	100
10/05/09 - 10/11/09	167	6.1	7.5	6.7	100
10/12/09 - 10/18/09	168	6.6	8.0	7.4	100
10/19/09 - 10/25/09	167	5.5	8.0	7.0	100
10/26/09 - 11/01/09	168	1.6	7.1	5.8	98
11/02/09 - 11/08/09	168	5.7	7.3	6.6	100
11/09/09 - 11/15/09	168	4.6	6.2	5.5	100
11/16/09 - 11/22/09	168	4.8	6.7	5.6	100
11/23/09 - 11/29/09	168	4.7	7.2	6.1	100
11/30/09 - 12/06/09	168	5.8	7.5	6.8	100
12/07/09 - 12/13/09	168	6.3	10.1	8.6	100
12/14/09 - 12/20/09	168	7.2	9.5	8.3	100
12/21/09 - 12/27/09	168	7.1	10.6	8.6	100
12/28/09 - 12/31/09	96	7.7	10.3	8.8	100

TABLE A-18: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT 104TH AVENUE ON THE
 CALUMET-SAG CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 03/29/09			NO DATA		
03/30/09 - 04/05/09	109	8.4	9.2	8.7	100
04/06/09 - 04/12/09	61	8.4	10.2	9.5	100
04/13/09 - 04/19/09	108	8.3	10.0	9.2	100
04/20/09 - 04/26/09	60	8.2	9.3	8.6	100
04/27/09 - 05/03/09	107	5.2	7.5	6.6	100
05/04/09 - 05/10/09	168	5.0	7.1	6.1	100
05/11/09 - 05/17/09	59	6.1	7.7	6.7	100
05/18/09 - 05/24/09	109	4.9	7.2	5.8	100
05/25/09 - 05/31/09	168	4.2	6.4	5.2	100
06/01/09 - 06/07/09	168	4.0	5.2	4.7	100
06/08/09 - 06/14/09	168	2.3	5.9	4.3	88
06/15/09 - 06/21/09	59	4.5	5.9	4.9	100
06/22/09 - 06/28/09			NO DATA		
06/29/09 - 07/05/09	109	4.5	5.8	5.1	100
07/06/09 - 07/12/09	168	4.2	5.5	5.0	100
07/13/09 - 07/19/09	58	4.6	6.3	5.7	100
07/20/09 - 07/26/09	109	5.7	8.4	7.0	100
07/27/09 - 08/02/09	59	5.1	7.8	6.7	100
08/03/09 - 08/30/09			NO DATA		
08/31/09 - 09/06/09	109	5.7	6.9	6.3	100
09/07/09 - 09/13/09	168	5.6	6.8	6.3	100
09/14/09 - 09/20/09	168	5.5	6.4	6.0	100
09/21/09 - 09/27/09	168	4.7	6.2	5.5	100
09/28/09 - 10/04/09	168	5.8	6.8	6.4	100
10/05/09 - 10/11/09	168	5.7	7.1	6.6	100
10/12/09 - 10/18/09	168	6.1	7.8	7.1	100
10/19/09 - 10/25/09	168	4.8	8.0	6.9	100
10/26/09 - 11/01/09	59	6.1	6.8	6.4	100
11/02/09 - 11/22/09			NO DATA		
11/23/09 - 11/29/09	156	4.7	7.2	6.0	100
11/30/09 - 12/06/09	60	6.2	6.6	6.4	100
12/07/09 - 12/31/09			NO DATA		

TABLE A-19: WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT ROUTE 83 ON THE
 CALUMET-SAG CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/09 - 01/04/09	96	10.4	11.5	10.9	100
01/05/09 - 01/11/09	59	9.8	11.5	10.7	100
01/12/09 - 02/01/09		NO DATA			
02/02/09 - 02/08/09	108	8.9	9.9	9.3	100
02/09/09 - 02/15/09	168	8.4	10.6	9.8	100
02/16/09 - 02/22/09	167	9.4	11.1	10.0	100
02/23/09 - 03/01/09	168	9.8	11.2	10.5	100
03/02/09 - 03/08/09	168	8.5	11.2	10.2	100
03/09/09 - 03/15/09	167	9.1	11.2	10.4	100
03/16/09 - 03/22/09	168	6.7	9.7	7.7	100
03/23/09 - 03/29/09	168	7.5	11.2	9.3	100
03/30/09 - 04/05/09	168	7.9	10.5	9.0	100
04/06/09 - 04/12/09	168	7.9	9.8	9.1	100
04/13/09 - 04/19/09	168	7.2	9.8	8.5	100
04/20/09 - 04/26/09	168	6.5	8.5	7.5	100
04/27/09 - 05/03/09	168	5.2	7.8	6.4	100
05/04/09 - 05/10/09	168	3.9	7.2	6.0	100
05/11/09 - 05/17/09	168	5.0	8.0	6.1	100
05/18/09 - 05/24/09	168	4.5	6.3	5.3	100
05/25/09 - 05/31/09	168	3.6	6.0	4.9	100
06/01/09 - 06/07/09	168	3.5	5.3	4.5	100
06/08/09 - 06/14/09	168	3.5	5.6	4.5	100
06/15/09 - 06/21/09	168	4.1	5.7	4.7	100
06/22/09 - 06/28/09	168	3.3	5.3	4.3	100
06/29/09 - 07/05/09	168	4.3	5.7	5.0	100
07/06/09 - 07/12/09	168	4.0	5.5	4.7	100
07/13/09 - 07/19/09	168	4.0	9.7	6.2	100
07/20/09 - 07/26/09	168	4.6	8.1	6.3	100
07/27/09 - 08/02/09	168	4.3	10.2	6.1	100
08/03/09 - 08/09/09	168	3.9	8.3	5.5	100
08/10/09 - 08/16/09	168	3.8	13.2	8.2	100
08/17/09 - 08/23/09	168	3.8	11.4	6.2	100
08/24/09 - 08/30/09	168	4.7	6.4	5.3	100
08/31/09 - 09/06/09	168	4.7	6.6	5.6	100

TABLE A-19 (Continued): WEEKLY DISSOLVED OXYGEN SUMMARY STATISTICS
 AT ROUTE 83 ON THE
 CALUMET-SAG CHANNEL DURING 2009

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
09/07/09 - 09/13/09	168	5.2	6.7	5.8	100
09/14/09 - 09/20/09	168	5.1	6.6	5.9	100
09/21/09 - 09/27/09	168	4.8	5.9	5.2	100
09/28/09 - 10/04/09	168	5.0	6.7	6.2	100
10/05/09 - 10/11/09	168	5.0	7.0	6.4	100
10/12/09 - 10/18/09	168	5.9	7.7	7.1	100
10/19/09 - 10/25/09	168	4.8	8.1	6.9	100
10/26/09 - 11/01/09	168	3.1	7.0	5.7	100
11/02/09 - 11/08/09	168	5.2	7.1	6.3	100
11/09/09 - 11/15/09	168	5.0	6.3	5.4	100
11/16/09 - 11/22/09	168	5.0	6.9	5.8	100
11/23/09 - 11/29/09	168	4.8	7.1	6.0	100
11/30/09 - 12/06/09	168	5.8	7.4	6.5	100
12/07/09 - 12/13/09	168	6.3	10.5	8.6	100
12/14/09 - 12/20/09	168	7.8	10.3	9.1	100
12/21/09 - 12/27/09	168	7.9	10.6	8.9	100
12/28/09 - 12/31/09	96	8.8	10.6	9.9	100

TABLE A-20: SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross-Sectional Dissolved Oxygen						
		Cross Section Depth Range (feet)	N*	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
North Shore Channel								
<u>Main Street</u>								
04/03/09	9.56	1.8 – 5.0	7	10.23	11.58	10.98	0.55	5.02
08/07/09	7.41	2.2 – 4.5	8	8.03	8.29	8.14	0.09	1.10
11/13/09	1.48	3.1 – 4.6	9	2.16	2.83	2.60	0.20	7.76
<u>Foster Avenue</u>								
04/14/09	9.36	3.3 – 8.7	10	8.65	8.73	8.68	0.02	0.26
09/09/09	7.24	3.3 – 8.6	10	7.47	7.56	7.52	0.03	0.41
12/01/09	7.42	4.2 – 8.9	10	7.52	7.59	7.57	0.02	0.27
North Branch Chicago River								
<u>Addison Street</u>								
04/14/09	8.36	5.5 – 8.4	11	8.19	8.48	8.40	0.11	1.35
09/09/09	7.27	3.9 – 7.9	9	7.02	7.10	7.05	0.03	0.41
12/01/09	7.95	4.8 – 7.7	9	7.81	7.88	7.84	0.03	0.33
<u>Fullerton Avenue</u>								
04/14/09	5.81	8.9–13.5	12	5.62	5.95	5.82	0.12	2.05
09/09/09	6.52	8.6–13.5	12	6.30	6.42	6.35	0.04	0.56
12/01/09	NA	8.3–14.2	12	7.22	7.38	7.29	0.04	0.58

TABLE A-20 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross-Sectional Dissolved Oxygen						
		Cross Section Depth Range (feet)	N*	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
North Branch Chicago River								
<u>Kinzie Street</u>								
04/14/09	6.35	11.2 – 19.2	12	6.15	6.29	6.20	0.04	0.59
09/09/09	4.69	10.6 – 20.3	12	5.70	5.77	5.75	0.03	0.45
12/01/09	5.98	11.0 – 21.1	12	6.54	6.64	6.60	0.03	0.47
Chicago River								
<u>Clark Street</u>								
04/14/09	9.34	12.0 – 22.1	12	6.30	8.98	8.50	0.76	8.96
09/09/09	8.59	15.5 – 23.7	12	8.11	8.39	8.31	0.08	0.97
12/01/09	9.59	13.6 – 23.5	12	6.71	9.56	9.20	0.79	8.54
South Branch Chicago River								
<u>Loomis Street</u>								
04/09/09	7.39	14.6 – 22.4	12	6.81	7.62	7.44	0.26	3.47
08/13/09	7.68	18.9 – 23.2	12	7.40	7.76	7.64	0.10	1.26
11/19/09	6.75	15.6 – 22.5	12	6.93	7.03	7.00	0.03	0.44

TABLE A-20 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen				
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Bubbly Creek								
<u>36th Street</u>								
04/09/09	0.56	3.6 – 4.2	8	0.37	0.75	0.61	0.15	24.58
11/19/09	5.13	2.0 – 4.9	8	5.26	6.92	6.25	1.42	22.69
<u>Interstate Highway 55</u>								
04/09/09	6.95	3.9 – 11.0	9	5.27	8.51	6.78	0.83	12.25
08/13/09	4.46	5.3 – 10.6	10	4.50	6.62	4.98	0.63	12.57
11/19/09	6.03	5.5 – 11.3	11	4.53	6.26	5.91	0.49	8.24
Chicago Sanitary and Ship Canal								
<u>Cicero Avenue</u>								
04/09/09	6.92	7.5 – 18.2	11	6.79	7.06	6.99	0.09	1.30
08/13/09	5.28	8.0 – 17.3	12	5.00	5.33	5.21	0.09	1.66
11/19/09	4.66	8.4 – 18.5	12	4.76	4.89	4.83	0.04	0.77
<u>B&O Railroad</u>								
04/08/09	9.27	6.8 – 19.5	11	8.54	8.83	8.73	0.11	1.21
08/12/09	5.12	6.1 – 19.4	11	5.03	5.42	5.28	0.10	1.98
11/18/09	6.60	6.8 – 19.3	11	6.55	6.61	6.58	0.03	0.43

TABLE A-20 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross-Sectional Dissolved Oxygen Samples						Coefficient of Variation (%)
		Cross Section Depth Range (feet)	N*	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	
Chicago Sanitary and Ship Canal								
<u>Route 83</u>								
04/08/09	8.04	17.9 – 23.7	12	7.43	7.67	7.55	0.07	0.91
08/12/09	5.36	18.4 – 24.0	12	5.82	6.64	6.19	0.30	4.89
11/18/09	5.63	19.3 – 23.7	12	5.50	5.57	5.53	0.02	0.39
<u>Lockport Powerhouse</u>								
04/06/09	7.93	24.3 – 30.0	12	7.48	7.74	7.62	0.08	0.98
08/10/09	4.25	28.1 – 29.7	12	4.49	4.74	4.58	0.07	1.53
11/16/09	4.96	22.6 – 30.9	12	4.98	5.15	5.06	0.07	1.34
Little Calumet River								
<u>C&WI Railroad</u>								
04/08/09	13.26	8.5 – 15.5	12	11.98	14.70	13.48	0.69	5.13
11/18/09	9.28	8.3 – 12.5	12	8.67	8.84	8.72	0.05	0.58

TABLE A-20 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	Cross-Sectional Dissolved Oxygen Samples					Coefficient of Variation (%)
			N*	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	
Little Calumet River								
<u>Halsted Street</u>								
04/08/09	8.05	5.8 – 14.8	10	7.37	8.05	7.76	0.20	2.60
11/18/09	5.87	5.0 – 13.8	11	5.78	6.01	5.93	0.08	1.26
Calumet-Sag Channel								
<u>Cicero Avenue</u>								
04/08/09	10.47	6.5 – 12.9	11	9.26	9.41	9.33	0.05	0.57
08/12/09	NA	8.9 – 13.3	12	7.79	9.35	8.81	0.46	5.19
11/18/09	6.21	4.9 – 13.5	10	6.41	6.55	6.48	0.05	0.72
<u>104th Avenue</u>								
04/08/09	NA	5.8 – 13.8	10	9.31	9.43	9.37	0.04	0.46
08/12/09	NA	3.3 – 14.1	10	5.66	7.30	6.40	0.56	8.82
11/18/09	NA	6.8 – 13.8	11	5.87	5.91	5.89	0.01	0.22
<u>Route 83</u>								
04/08/09	9.75	8.2 – 11.7	12	9.25	9.39	9.32	0.06	0.60
08/12/09	6.04	8.4 – 15.2	12	5.36	6.37	5.91	0.27	4.54
11/18/09	6.94	8.3 – 14.5	12	6.11	6.19	6.15	0.03	0.43

TABLE A-20 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS
MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross-Sectional Dissolved Oxygen Samples						
		Cross Section Depth Range (feet)	N*	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Des Plaines River								
<u>Jefferson Street</u>								
04/06/09	11.01	12.5 – 22.7	12	10.76	10.95	10.84	0.06	0.57
08/10/09	4.64	13.2 – 21.5	12	4.50	4.69	4.60	0.07	1.47
11/16/09	6.61	12.2 – 22.0	12	6.61	6.70	6.65	0.05	0.70

*Number of DO measurements made across transect during cross-sectional survey.
NA = Not Available.