

APPENDIX J

SEWRPC Technical Memorandum- March 28, 2005- Point Source Calculations for
Purposes of Watercourse Modeling-Addendum: Point Sources Located Outside of
the MMSD Planning Area.

SEWRPC Technical Memorandum

**POINT SOURCE LOADINGS CALCULATIONS FOR PURPOSES
OF WATERCOURSE MODELING—ADDENDUM: POINT SOURCES
LOCATED OUTSIDE OF THE MMSD PLANNING AREA**

Prepared by the

Southeastern Wisconsin Regional Planning Commission

March 28, 2005

SEWRPC Technical Memorandum

POINT SOURCE LOADINGS CALCULATIONS FOR PURPOSES OF WATERCOURSE MODELING—ADDENDUM: POINT SOURCES LOCATED OUTSIDE OF THE MMSD PLANNING AREA

INTRODUCTION

Purpose

Watercourse computer modeling is currently underway to evaluate the instream water quality conditions within the entirety of the Kinnickinnic River, Menomonee River, Milwaukee River, Oak Creek, and Root River watersheds. This modeling is intended to serve as a planning tool as part of the cooperative and coordinated efforts by the Milwaukee Metropolitan Sewerage District (MMSD) for its 2020 facilities planning effort and the Southeastern Wisconsin Regional Planning Commission (SEWRPC) for its update of the Regional Water Quality Management Plan. The technical work on the water quality modeling is being conducted by the MMSD 2020 facilities plan technical consulting team and is being overseen by SEWRPC staff. The approach to cooperatively carrying out the MMSD facilities planning program and the regional water quality management plan updating program has been developed cooperatively by the Wisconsin Department of Natural Resources (WDNR), the MMSD (including its facilities plan consultant team), and the Southeastern Wisconsin Regional Planning Commission and has been conceptually formalized under February 19, 2003 WDNR/MMSD/SEWRPC Memorandum of Understanding.¹ Under the approach envisioned, it is proposed to conduct two separate, but coordinated cooperative planning programs. One planning effort is the preparation of an update to the regional water quality management plan for the entirety of the watersheds of the greater Milwaukee area and one is a facilities planning program for the Milwaukee Metropolitan Sewerage District sewerage systems. Watercourse computer modeling is an important component of each of these planning efforts. Point source pollutant loads are one of the input components to the computer model.

A previous technical memorandum prepared by the MMSD 2020 Facilities Planning Team and dated December 2004 summarized the types of point source pollutant discharges to waterways within the MMSD planning area and identified the sources of data, assumptions, protocols, and methodologies used to calculate the point source pollutant loadings.² The purpose of this addendum is to provide additional information regarding point sources of water pollution for those portions of the watersheds being modeled that are outside of the MMSD planning area, as shown in Map 1. This addendum summarizes the types of pollutant point sources that discharge to the upper Milwaukee River watershed, the lower Root River watershed, and the portions of the Lake Michigan direct drainage area north of Wind Point.

¹Memorandum of Understanding Between the Milwaukee Metropolitan Sewerage District (District), the Southeastern Wisconsin Regional Planning Commission (SEWRPC), and the Wisconsin Department of Natural Resources (DNR) for Cooperation in the Watershed Approach to Water Quality and Facilities Planning, *February 19, 2003*.

²Mary Recketenwalt, Jeremy Nitka, Tom Sear, and Larua Gerold, Point Source Loadings Calculations for Purposes of Water Quality Modeling: MMSD Planning Area, *Draft Technical Memorandum, Triad Engineering, December 13, 2004*.

Point Source Description and Identification

With the exception of MMSD sanitary sewer overflows (SSO) and MMSD combined sewer overflows (CSO), the types of point sources being quantified for the purposes of input into the watercourse model are the same as in the memorandum for the MMSD planning area.³ These are:

- Local Community Sanitary Sewer Bypasses,
- Private and Municipal Sewerage Treatment Plants,
- Industrial Discharges, and
- Other Point Sources (as identified).

Pollutant loadings for MMSD SSO and CSO locations are not presented in this addendum because all of these are located within the MMSD planning area and were presented in the December 2004 point source memorandum.

Locations for all modeled point sources in the areas covered by this addendum were determined and entered into a geographical information system (GIS) database. These locations were then verified by site visits when needed to confirm or refine the locations. These locations are shown in Maps 2, 3, and 4 for the upper Milwaukee River watershed, the lower Root River watershed and the Lake Michigan direct drainage areas respectively.

Pollutant Loading Calculations

Pollutant loading calculations for this addendum were made for the same pollutants as in the December 2004 point source technical memorandum. Pollutant mass loadings were calculated using the methods described in the original point source memorandum.

PRIVATE AND MUNICIPAL SEWAGE TREATMENT PLANTS

Monitoring data for 2003 were obtained from the WDNR for private and municipal wastewater treatment plants. In addition, the WDNR provided monitoring data from 2002 for some facilities. These data include mean daily flow and biological oxygen demand (BOD5) for all facilities, total suspended solids (TSS) for all but one facility, and a variety of other pollutants for selected facilities. Tables 1, 2, and 3 show 2003 pollutant loads that were calculated from these data for the facilities in the upper Milwaukee River watershed, the lower Root River watershed, and the Lake Michigan direct drainage area respectively. In addition to the municipal treatment plants noted herein, the City of Racine wastewater treatment plant is located in the Lake Michigan direct drainage area just to the south of the study area and serves a large portion of the study area. The discharge from that wastewater treatment plant is to Lake Michigan south of the study area. These tables do not include data from those wastewater treatment facilities that discharge to groundwater.

³Ibid.

LOCAL COMMUNITY SANITARY SEWER BYPASSES

Inventories of local community sanitary sewer bypass sites for the upper Milwaukee River watershed, the lower Root River watershed, and the Lake Michigan direct drainage area are given in Tables 4, 5, and 6 respectively. Annual sewage bypass reports for the State of Wisconsin were obtained from the WDNR for the years 1994-2002. During this period, bypasses were reported in the upper Milwaukee River watershed on 55 days at approximately 28 locations. In the lower Root River watershed, bypasses were reported on 27 days at approximately 10 locations. Bypasses were reported in the Lake Michigan direct drainage area on 15 days at approximately nine locations. Tables 7, 8, and 9 present the dates, locations, and volumes of local community sanitary sewer bypasses for the upper Milwaukee River watershed, the lower Root River watershed, and the Lake Michigan direct drainage area respectively. Because the communities often reported one overflow volume on a particular date at “various locations” or “several locations”, these totals most likely underestimate the number of locations experiencing overflows. On occasions where the local communities reported overflows at “various locations” and the community could not provide more specific information on overflow locations, the overflow volume was assumed to have been equally distributed among the previously reported overflow stations, which is consistent with the methodologies described in the December 2004 point source memorandum.

Because the WDNR does not require local communities to sample or chemically analyze sanitary sewer bypasses and overflows, data on pollutant concentrations are not available for local community bypasses. It is recommended that the pollutant concentrations presented in the December 2004 point source memorandum⁴ to represent SSOs from MMSD and other municipal dischargers in the MMSD planning area be used to represent local community sanitary sewer bypasses for the communities covered by this addendum. Hydrographs and pollutant loadings are also recommended to be developed using the same methods as used in the original point source memorandum.⁵

OTHER POINT SOURCE DISCHARGES

Through its Wisconsin Pollutant Discharge Elimination System (WPDES), the WDNR permits 92 dischargers, other than public and private wastewater treatment plants, to the surface waters in the areas covered by this addendum. The types of discharge permits in effect as of February 2003 are summarized in Table 10. Tables 11, 12, and 13 provide summary listings of all the permits in effect as of February 2003 in the upper Milwaukee River watershed, the lower Root River watershed, and the Lake Michigan direct drainage area respectively. As noted in the December 2004 point source memorandum,⁶ only data from facilities with individual permits and noncontact cooling water general permits will be used as input data for the watercourse model.

Monitoring data for facilities with individual permits or general permits for noncontact cooling water were obtained from the WDNR for the latest year available. In some instances, two years of data were available. When two years of data were available, loadings represent the average values for both years. Chemistry data, volumes, and pollutant loadings were calculated in accordance with the procedures

⁴Ibid.

⁵Ibid.

⁶Ibid.

described in the December 2004 point source memorandum.⁷ Pollutant loadings for the most recent year available are given in Tables 14, 15, and 16 for the upper Milwaukee River watershed, the lower Root River watershed, and the Lake Michigan direct drainage area respectively.

OTHER DISCRETE SOURCES

No other discrete sources were identified for further review and analysis. There are six large farm animal operations which are permitted by the Wisconsin Department of Natural Resources in the study area. These are documented in the February 25, 2005, technical memorandum on inventory of crop type and farming practices in the Milwaukee and Root River watersheds.

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⁷Ibid.

Table 1

**POLLUTANT LOADING AND WATER QUALITY PARAMETERS FROM WASTEWATER
TREATMENT PLANTS IN THE UPPER MILWAUKEE RIVER WATERSHED: 2003**

Number on Map 2	Facility	Flow	BOD5		TSS		Total Phosphorus		Ammonia-Nitrogen	
		Mean (mgd)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Mean (mg/l)	Daily (lb/day)	Annual (lb/yr)
1	Campbellsport.....	0.22	3.87	1,413	3.12	1,137	--	--	--	--
2	Cascade ^a	0.06	8.90	3,249	13.06	4,767	4.68	1,706	6.34	2,315
3	Cedarburg ^a	1.65	35.93	13,115	37.50	13,686	5.12	1,868	0.36	130
4	Fredonia ^a	0.19	5.73	2,091	8.15	2,973	6.18	2,257	7.12	2,599
5	Grafton ^a	1.27	67.56	24,661	92.99	33,942	7.63	2,785	1.80	655
6	Jackson ^a	0.81	20.63	7,529	26.00	9,255	6.06	2,210	1.00	366
8	Kewaskum ^a	0.51	22.15	8,085	18.75	6,842	23.06	842	0.29	106
9	Level Valley Creamery ^a	0.25	4.23	1,543	4.20	1,533	0.56	203	0.08 ^b	28 ^b
10	Long Lake Recreation Area ...	<0.01	0.09	34	--	--	--	--	--	--
11	Newburg ^a	0.11	9.56	3,487	5.51	2,013	2.50 ^c	913 ^c	10.93	3,991
12	Random Lake ^a	0.21	5.76	2,101	11.70	4,270	1.32	480	0.27	97
13	Saukville ^a	0.82	23.19	8,465	24.76	9,036	4.22	1,539	0.47	170
14	West Bend ^a	3.42	30.33	11,069	33.07	12,070	16.19	5,910	1.94	709

Number on Map 2	Facility	Fecal Coliform	Copper		Zinc		Temperature	Dissolved Oxygen
		Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Mean	Mean (mg/l)
1	Campbellsport.....	--	--	--	--	--	--	--
2	Cascade ^a	29.25	--	--	--	--	--	--
3	Cedarburg ^a	1.20	--	--	--	--	--	--
4	Fredonia ^a	43.10	--	--	--	--	--	--
5	Grafton ^a	41.64	0.210	77	--	--	--	8.4
6	Jackson ^a	8.60	--	--	--	--	--	8.3
8	Kewaskum ^a	28.06	--	--	--	--	--	4.9
9	Level Valley Creamery ^a	--	--	--	--	--	73.4	6.6
10	Long Lake Recreation Area ...	--	--	--	--	--	--	--
11	Newburg ^a	3.00	0.010	4	--	--	--	--
12	Random Lake ^a	93.94	--	--	--	--	--	10.0
13	Saukville ^a	5.00	0.076	28	0.54	196	--	8.4
14	West Bend ^a	5.36	0.509	186	0.33	122	--	8.2

^aData are also available for 2002.

^bLoading of total nitrogen.

^cWisconsin Department of Natural Resources estimate based on facility performance.

^dData from 2002.

Source: Wisconsin Department of Natural Resources and SEWRPC.

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Table 2

**POLLUTANT LOADING AND WATER QUALITY PARAMETERS FROM
 WASTEWATER TREATMENT PLANTS IN THE ROOT RIVER WATERSHED: 2003**

Number on Map 3	Facility	Flow	BOD5		TSS		Total Phosphorus		Ammonia-Nitrogen	
		Mean (mgd)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
1	Fonks Home Center...	0.03	2.270	828	1.75	637	--	--	--	--
2	Union Grove.....	0.72	34.085	12,441	30.88	11,272	--	--	--	--
3	Yorkville.....	0.07	2.557	933	3.94	1,440	--	--	--	--

Number on Map 3	Facility	Fecal Coliform	Copper		Zinc		Dissolved Oxygen	Temperature
		Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (mg/l)	Annual (lb/yr)	Mean (mg/l)	Mean
1	Fonks Home Center...	--	--	--	--	--	--	--
2	Union Grove.....	--	--	--	--	--	--	--
3	Yorkville.....	--	--	--	--	--	--	--

Source: Wisconsin Department of Natural Resources and SEWRPC.

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Table 3

**POLLUTANT LOADING AND WATER QUALITY PARAMETERS FROM WASTEWATER
 TREATMENT PLANTS IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA: 2003**

Number on Map 4	Facility	Flow	BOD5		TSS		Total Phosphorus		Ammonia-Nitrogen	
		Mean (mgd)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
1	South Milwaukee	3.45	332	121,265	118	68,769	--	--	--	--

Number on Map 4	Facility	Fecal Coliform	Copper		Zinc		Dissolved Oxygen	Temperature
		Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (mg/l)	Annual (lb/yr)	Mean (mg/l)	Mean
1	South Milwaukee	--	--	--	--	--	--	--

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 4

SANITARY SEWER BYPASS AND OVERFLOW SITES IN THE UPPER MILWAUKEE RIVER WATERSHED: 1994-2004

Number on Map 2	Community	Location	Number of Reported Events		Average Reported Overflow Volume per Event 2000- 2004 (mg)
			1994-2004 ^a	2000-2004 ^a	
56	Adell	Lift station at CTH I and CTH A	2	--	--
57		Lift station at 608 Tower Avenue	4	1	0.100
58		STH 57 between CTH I and CTH W	1	1	<0.001
35	Cedarburg	Doerr Way lift station	1	1	-- ^b
34		Dorchester Drive lift station	2	2	0.120
34		Manhole at Dorchester Drive	1	1	0.109
3		Wastewater treatment plant	2	--	--
50	Fredonia	Manhole at Park Avenue	2	--	--
49		Manhole at Wisconsin Street	4	--	--
48		Manhole at Wisconsin Street and Wenzel Avenue	2	1	0.035
42	Grafton	11th Avenue lift station	1	--	--
41		14th Avenue lift station	1	--	--
39		17th Avenue lift station	5	--	--
38		Bridge Street lift station	3	--	--
43		Green Bay Road lift station	2	--	--
36		Manhole at 7th Avenue and North Street	5	--	--
44		Manhole at 10th Avenue and Power Street	1	--	--
37		Manhole at 13th Avenue and Veteran's Park	5	--	--
40		Manhole at Meadowbrooke Court and 11th Avenue	2	--	--
5		Wastewater treatment plant	12	--	--
52	Jackson	Manhole at Glen Brooke Avenue	1	--	--
6		Wastewater treatment plant	2	--	--
7	Kettle Moraine Correctional Institution	Wastewater treatment plant	2	1	0.049
59	Kewaskum	Manhole on Roseland Drive	1	--	--
53		Manhole preceding main lift station	1	1	0.093
54	Newburg	Lift Station 1, Main Street	1	--	--
45	Saukville	N. Mill Street lift station	1	--	--
46		Manhole at STH 33 and N. Mill Street	3	3	0.540
13		Wastewater treatment plant	1	--	--
51	West Bend	Manhole at 2005 S. Main Street	1	--	-- ^{b,c}
55		Manhole at Gadow Lane	1	1	-- ^{b,c}
14		Wastewater treatment plant	1	--	--

^aData available through June 17, 2004.

^bVolume of the overflow was not reported.

^cOverflow was the result of vandalism.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 5

SANITARY SEWER BYPASS AND OVERFLOW SITES IN THE LOWER ROOT RIVER WATERSHED: 1994-2004

Number on Map 3	Community	Location	Number of Reported Events		Average Reported Overflow Volume per Event 2000- 2004 (mg)
			1994-2004 ^a	2000-2004 ^a	
17	Caledonia	6724 4-Mile Road	1	1	-- ^b
10	Racine	Lift Station 2, 2000 Spring Street	3	3	0.135
9		Lift Station 8, 3640 Northwestern Avenue	5	3	0.150
11		Lift Station 10, 800 S. Memorial Drive	1	1	-- ^b
12		SO5, 21st Street and Grove Avenue	1	1	0.005
13		SO6, Washington Avenue and Grove Avenue	6	6	0.291
14		SO9, Ontario Street Siphon	5	5	0.352
15		SO12, Golf Avenue and Conrad Road	3	3	0.278
16		E. 6th Street Siphon	1	1	-- ^b
2	Union Grove	Wastewater treatment plant	4	1	1.000

^aData available through June 17, 2004.

^bVolume was reported for several locations. No separate volume was available for this site.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 6

SANITARY SEWER BYPASS AND OVERFLOW SITES IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA: 1994-2004

Number on Map 4	Community	Location	Number of Reported Events		Average Reported Overflow Volume per Event 2000- 2004 (mg)
			1994-2004 ^a	2000-2004 ^a	
1	Crestview Sanitary District	Manhole at Indian Trail and Elderberry Road	4	2	0.155
2	North Park Sanitary District	4-Mile Road and Hunt Club Road	1	1	0.025
3		468 E. 4-Mile Road	1	--	--
4		362 E. 4-Mile Road	1	--	--
5		4015 6-Mile Road	1	--	--
6		4129 6-Mile Road	1	--	--
7		4305 6-Mile Road	1	--	--
8		Lift Station at 6323 Douglas Avenue	2	--	--
9		5809 Erie Street	1	1	0.004
10		Birch Creek at Valley Trail	1	1	0.025

^aData available through June 17, 2004.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 7

**LOCAL COMMUNITY SANITARY SEWER BYPASSES AND
OVERFLOWS IN THE UPPER MILWAUKEE RIVER WATERSHED: 1994-2004**

Date	Community	Location	Reported Overflow Volume (millions of gallons)
March 23, 1994	West Bend	Manhole in Barton ^b	Not reported ^c
July 5, 1994	Campbellsport	Manhole ^b	0.00450
July 7, 1994	Grafton	Manholes at 7th Avenue and North Street and 13th Avenue and Veteran's Park	0.02200
July 14, 1994	Grafton	Several locations	0.04230
January 7, 1995	Cedarburg	Several locations	0.06000
August 28, 1995	Grafton	Bridge Street Lift Station	0.00300
October 17, 1995	Kettle Moraine Correctional Institution	Wastewater treatment plant	0.00100 ^d
May 11, 1996	Jackson	Wastewater treatment plant	Not reported
June 7, 1996	Fredonia	Two locations	0.21000
June 7, 1996	Fredonia	Manhole at Park Avenue	0.10500
June 7, 1996	Jackson	Wastewater treatment plant	Not reported
June 7-8, 1998	West Bend	Wastewater treatment plant and several locations	Not reported
June 17, 1996	Cedarburg	Wastewater treatment plant and several locations	0.49600
June 17-19, 1996	Fredonia	Several locations	1.50000
June 17-18, 1996	Grafton	Several locations	0.21100
June 17, 1996	Jackson	Manhole on Glen Brooke Drive	Not reported
June 17, 1996	Newburg	Lift Station No. 1	0.12000
June 17-20, 1996	Saukville	Wastewater treatment plant and N. Mill Street Lift Station	2.41000
July 18, 1996	Fredonia	Manhole on Wisconsin Street	0.02700
November 26– December 2, 1996	Adell	Lift station at CTH I and CTH A	0.03600
June 20-21, 1997	Adell	Lift station at CTH I and CTH A	0.10000
June 21, 1997	Cedarburg	Wastewater treatment plant	0.01800
June 21, 1997	Fredonia	Several locations	0.03100
June 21, 1997	Grafton	Wastewater treatment plant	0.01500
June 21, 1997	Grafton	Manhole at 7th Avenue and North Street	0.05000
June 21, 1997	Grafton	Manhole at 13th Avenue and Veteran's Park	0.02500
June 21, 1997	Grafton	17th Avenue Lift Station	0.00180
July 13-14, 1997	Grafton	17th Avenue Lift Station	0.01935
July 16-17, 1997	Grafton	17th Avenue Lift Station	0.00600
March 13, 1998	Grafton	17th Avenue Lift Station	0.00360
March 16, 1998	Grafton	17th Avenue Lift Station	0.00360
March 30-31, 1998	Kewaskum	Manhole on Roseland Drive	0.28000

Table 7 (continued)

Date	Community	Location	Reported Overflow Volume (millions of gallons)
March 31-April 1, 1998	Adell	Lift Station at Tower Avenue	0.20000
March 31-April 1, 1998	Fredonia	Several locations	0.43800
April 16, 1998	Fredonia	Several locations	0.00900
May 1, 1998	Adell	Lift Station at Tower Avenue	0.00400
May 1, 1998	Fredonia	Two locations	0.02200
May 31, 1998	Grafton	Several lift stations	0.07500
August 6, 1998	Adell	Lift Station at Tower Avenue	0.03500
August 6, 1998	Fredonia	Two Locations	0.04200
January 22-23, 1999	Fredonia	Manhole on Wisconsin Street	0.01000
April 4, 1999	Fredonia	Manhole at the end of Wisconsin Street	0.01500
April 23, 1999	Fredonia	Manholes on Park Avenue and the end of Wisconsin Street	0.19000
April 23, 1999	Grafton	Manhole at 7th Avenue and North Street	0.01650
April 23, 1999	Grafton	Manhole at 13th Avenue and Veteran's Park	0.00525
April 23, 1999	Grafton	Manhole at Meadowbrooke Court and 11th Avenue	0.02025
July 20, 1999	West Bend	Several locations	0.10000
May 18-19, 2000	Cedarburg	Manhole at Dorchester Drive	0.10900
April 11, 2001	Fredonia	Manhole at Wisconsin Street and Wenzel Avenue	0.03500
August 9, 2001	West Bend	Manhole ^b	<0.00010 ^c
August 27, 2001	Kewaskum	Manhole preceding main lift station	0.09300
May 5, 2002	West Bend	Manhole at Gadow Lane	<0.00010 ^c
August 11, 2003	Kettle Moraine Correctional Institution	Wastewater treatment plant	0.04900
February 12, 2004	Adell	STH 57 between CTH I and CTH W	0.00050
May 14, 2004	Cedarburg	Dorchester Drive Lift Station	0.00830
May 21, 2004	Cedarburg	Dorchester Drive Lift Station	0.23200
June 11, 2004	Adell	Lift Station on Tower Avenue	0.10000
June 13-14, 2004	Saukville	Manhole at STH 33 and N. Mill Street	0.73500
June 14-15, 2004	Saukville	Manhole at STH 33 and N. Mill Street	0.67500
June 16-17, 2004	Saukville	Manhole at STH 33 and N. Mill Street	0.21600

^aData available through June 17, 2004.

^bLocation not mapped.

^cBypassing occurred due to blockage resulting from vandalism. Not expected to recur.

^dBypassing occurred due to break in sewer line during installation of a water main. Not expected to recur.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 8

**LOCAL COMMUNITY SANITARY SEWER BYPASSES AND
OVERFLOWS IN THE LOWER ROOT RIVER WATERSHED: 1994-2004^a**

Date	Community	Location	Overflow Volume (millions of gallons)
May 20, 1996	Racine	Several location in several watersheds	12.4000
May 22-23, 1996	Union Grove	Wastewater Treatment Plant	1.9100
June 5-7, 1996	Union Grove	Wastewater Treatment Plant	0.4510
August 25, 1997	Racine	Several locations in several watersheds	0.2970
April 9, 1998	Racine	Lift Station 8 at 3640 Northwestern Avenue	0.5460
April 16, 1998	Racine	Several locations in several watersheds	0.2050
January 23, 1999	Union Grove	Wastewater Treatment Plant	0.8800
April 23, 1999	Racine	Several locations in several watersheds	27.9000
May 18, 2000	Racine	Several locations in several watersheds	0.5500
June 1, 2000	Racine	Two locations in different watersheds	0.2130
June 12, 2000	Racine	Several locations in several watersheds	0.1630
July 2-3, 2000	Caledonia	Two locations in different watersheds	0.2640
July 2-3, 2000	Racine	Several locations in several watersheds	7.5800
February 8-9, 2001	Union Grove	Wastewater Treatment Plant	1.0000
February 9, 2001	Racine	SO6 at Washington Avenue and Grove Avenue	0.1660
February 9, 2001	Racine	SO9, Ontario Street Siphon	0.3150
February 9, 2001	Racine	Lift Station 2 at 2000 Spring Street	0.1350
June 12, 2001	Racine	Several locations in several watersheds	2.6000
September 19, 2001	Racine	SO5 at 21st Street and Grove Avenue	0.0050
September 19, 2001	Racine	Lift Station 8 at 3640 Northwestern Avenue	0.1500
October 13, 2001	Racine	SO6 at Washington Avenue and Grove Avenue	0.0725
October 13, 2001	Racine	SO9, Ontario Street Siphon	0.5410
October 13, 2001	Racine	SO12 at Golf Avenue and Conrad Road	0.0570
April 8, 2002	Racine	SO9, Ontario Street Siphon	0.5000
April 8, 2003	Racine	SO12, Golf Avenue and Conrad Road	0.5000
March 5, 2004	Racine	SO9, Ontario Street Siphon	0.0500
May 14, 2004	Racine	LS2, 2000 Spring Street and LS8, 3640 Northwestern Avenue	0.0500
May 21-22, 2004	Racine	SO6, Washington Avenue and Grove Avenue	0.5030
May 21-22, 2004	Racine	Several locations in several watersheds	0.0410
June 17, 2004	Racine	SO6, Washington Avenue and Grove Avenue	0.4220

^aData available through June 17, 2004

Table 9

**LOCAL COMMUNITY SANITARY SEWER BYPASSES AND
 OVERFLOWS IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA: 1994-2004^a**

Date	Community	Location	Overflow Volume (millions of gallons)
October 2, 1996	North Park Sanitary District	4015 6-Mile Road	0.0008
October 4, 1996	North Park Sanitary District	4129 6-Mile Road	0.0008
October 9, 1996	North Park Sanitary District	4305 6-Mile Road	0.0008
March 2, 1997	North Park Sanitary District	468 E. 4-Mile Road	0.0025
April 19, 1997	North Park Sanitary District	362 E. 4-Mile Road	0.0050
June 21, 1997	Crestview Sanitary District	Manhole at Indian Trail and Elderberry Drive	0.0900
July 21, 1997	North Park Sanitary District	Lift Station at 6323 Douglas Avenue	0.0030
March 9, 1998	North Park Sanitary District	Lift Station at 6323 Douglas Avenue	0.0027
April 23, 1999	Crestview Sanitary District	Manhole at Indian Trail and Elderberry Drive	0.1200
July 2-3, 2000	Caledonia	Two locations in different watersheds	0.2640
July 2-3, 2000	Crestview Sanitary District	Manhole at Indian Trail and Elderberry Drive	0.2900
July 2-3, 2000	North Park Sanitary District	Several locations	0.1800
February 9, 2001	Crestview Sanitary District	Manhole at Indian Trail and Elderberry Drive	0.0200
April 21, 2001	North Park Sanitary District	4-Mile Road and Hunt Club Road	0.0250
April 23, 2001	North Park Sanitary District	Birch Creek at Valley Trail	0.0250
March 12, 2002	North Park Sanitary District	5809 Erie Street	0.0037

^aData available through June 17, 2004.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 10

**WPDES POINT SOURCE DISCHARGE PERMITS FOR THE PORTION OF THE
STUDY AREA OUTSIDE OF THE MMSD PLANNING AREA: FEBRUARY, 2003**

Permit Type	Watershed			Total	Percent of Permits
	Upper Milwaukee	Lower Root	Lake Michigan Direct Drainage		
Carriage/Interstitial Water from Dredging	1	--	--	1	1.1
Concrete Products Operations	5	3	--	8	8.7
Contaminated Groundwater Remedial Actions	5	1	--	6	6.5
Discharge to Subsurface Absorption System	--	1	--	1	1.1
Hydrostatic Test Water and Water Supply System.....	11	4	4	19	20.6
Land Applying Food Process By-Product Solids.....	--	1	--	1	1.1
Land Applying Liquid Industrial Wastes.....	1	1	--	2	2.2
Land Applying Sludge	1	1	--	2	2.2
Noncontact Cooling Water	16	5	2	23	25.0
Nonmetallic Mining Operations.....	12	--	1	13	14.1
Petroleum Contaminated Water	--	--	--	0	0.0
Pit/Trench Dredging.....	2	--	--	2	2.2
Potable Water Treatment and Conditioning.....	2	--	--	2	2.2
Swimming Pool Facilities	4	--	--	4	4.3
Individual Permits.....	8	1	--	9	9.8
Total	68	17	7	92	100.0

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 11

KNOWN POINT SOURCE DISCHARGES IN THE UPPER MILWAUKEE RIVER WATERSHED: FEBRUARY 2003

Number on Map 2	Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
--	Carriage/Interstitial Water from Dredging	Henschke Hillside County Lake Access to Silver Lake	5607 & 5630 Peters Drive	City of West Bend	0046558		21763	No
--	Concrete Products Operations	Advance Cast Stone Company	W5104 Hwy 144	Village of Random Lake	0046507	460117460	16179	No
--		Jackson Concrete Company	605 W Pleasant Valley Road	Village of Jackson	0046507	267115090	7936	No
--		Schmitz Ready Mix	989 Ulao Road	Village of Grafton	0046507	246106740	8027	No
--		Schmitz Ready Mix	2707 Scenic Road	Town of Polk	0046507	267115530	10123	No
--		Yahrs Ready Mix	1020 S. Indiana Avenue	City of West Bend	0046507	267115970	8186	No
--	Contaminated Groundwater Remedial Actions	Deli-Food Xpress	1700 E. Washington Avenue	City of West Bend	0046566	267058500	14523	No
--		Praefke Brake	133 Oak Street	City of West Bend	0046566	267004430	14493	No
--		Superior Trucking Company	1319 Riverview Drive	Village of Kewaskum	0046566	267122240	14497	No
--		Tri Par Oil	1613 Washington Street	City of West Bend	0046566	246041730	14627	No
--	Hydrostatic Test Water and Water Supply System	Adell Waterworks	P.O. Box 47	Village of Adell	0057681	460043540	16178	No
--		ANR Pipeline Kewaskum Loop	T11N R20E Section 19 NE NE	Town of Trenton	0057681	--	29927	No
--		Cascade Waterworks	301 First Street	Village of Cascade	0057681	460043650	15152	No
--		Cedarburg Light and Water Commission	N30 W5926 Lincoln Blvd.	City of Cedarburg	0057681	246010820	14655	No
--		Fredonia Water Utility	P.O. Box 159	Village of Fredonia	0057681	246010930	18205	No
--		Jackson Water Utility	N168 W20733 Main Street	Village of Jackson	0057681	267011140	14673	No
--		Kewaskum Waterworks	204 First Street	Village of Kewaskum	0057681	267011250	14674	No
--		Random Lake Waterworks	690 Wolf Road	Village of Random Lake	0057681	460035510	15155	No
--		Saukville Water Utility	639 E. Green Bay Avenue	Village of Saukville	0057681	246013460	14651	No

Table 11 (continued)

Number on Map 2	Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
--		Village of Grafton Water & Wastewater Utility	1900 9th Avenue	Village of Grafton	0057681	246003010	5814	No
--		West Bend Water Utility	251 Municipal Drive	City of West Bend	0057681	267012020	14676	No
--	Land Applying Liquid Industrial Wastes	Marigold Foods, Inc.	W55 N155 McKinley Blvd.	City of Cedarburg	0057657	246010270	12176	No
--	Landspreading Sludge	Kerry Ingredients, Inc.	N168 W21455 Main Street	Village of Jackson	0057657	267074390	6892	No
15	Noncontact Cooling Water	Carlson Tool & Manufacturing Corporation	W57 N14386 Doerr Road	City of Cedarburg	0044938	246067580	800	Yes
--		Cedarburg Nail Factory Inn	4811 Columbia Road	City of Cedarburg	0044938	246000480	17035	No ^C
16		Charter Steel Division of Charter Manufacturing	1658 Cold Springs Road	Village of Saukville	0044938	246044700	1309	Yes
32		Dickman Manufacturing	606 Beech Street	Village of Grafton	0044938	246091120	168	Yes
17		Gehl Company	143 Water Street	City of West Bend	0044938	267003880	1171	Yes
18		Kerry Ingredients	N168 W21455 Main Street	Village of Jackson	0044938	267074390	6892	Yes
26		Leeson Electric Corporation	2100 Washington Street	Village of Grafton	0044938	246005100	3152	Yes
19		Mid City Foundry United Division	460 N. 9th Street	Village of Grafton	0044938	246096290	1839	Yes
--		Myers Manufacturing, Inc., Plant 2	N172 W20950 Emery Way	Village of Jackson	0044938	267063720	24277	No ^C
20		Norstar Aluminum Molds, Inc.	W66 N622 Madison Avenue	City of Cedarburg	0044938	246066150	2864	Yes
21		Riveredge Nature Center	4438 W. Hawthorne Drive	Village of Newburg	0044938	246032710	14649	Yes
22		Tecumseh Power Grafton Ops	900 North Street	Village of Grafton	0044938	246009170	2405	Yes
23		Universal Strap, Inc.	W209 N17500 Industrial Drive	Village of Jackson	0044938	267080220	14722	Yes
24		Vishay Cera Mite Grafton	1327 6th Avenue	Village of Grafton	0044938	246043820	2417	Yes
25		Weasler Engineering, Inc.	7801 North Hwy 45	Town of Barton	0044938	267019610	1760	Yes
--		West Bend Division of Regal Ware, Inc.	1100 Schmidt Road	City of West Bend	0044938	267067900	23790	No ^C
--	Nonmetallic Mining Operations	B R Amon & Sons Garbisch Pit	Boltonville Road	Town of Scott	0046515	460071810	24654	No
--		B R Amon & Sons Kraemer Pit	W7055 CTH N and High View Road	Town of Mitchell	0046515	460001850	15190	No
--		Hartman Sand & Gravel Company, Inc., Home Pit	N6621 Pioneer Dr	Village of Fredonia	0046515	246057020	23164	No

Table 11 (continued)

Number on Map 2	Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
--		Hartmann Sand & Gravel Company, Inc., Spring Lake Pit	North of Jay Road, East of Random Lake Road	Village of Fredonia	0046515		23165	No
--		Jackson Quarry	607 Pleasant Valley Road	Village of Jackson	0046515	267098810	16958	No
--		James Cape and Sons Cedarburg Limestone Quarry	6660 Susan Lane	City of Cedarburg	0046515	246105310	14399	No
--		Lake Ellen Stone, Inc.	N2113 Hwy 28	Village of Adell	0046515	460104370	867	No
--		Ozaukee County Highway Department Lakeland Pit	3601 Lakeland Road	Village of Saukville	0046515	246005760	25115	No
--		Payne & Dolan Saukville Aggregate Site 81005	2892 Lakeland Drive	Village of Saukville	0046515	999905280	2804	No
--		Rowe Sand & Gravel, Inc.	1219 Hwy I	Village of Grafton	0046515	246105750	3117	No
--		Werner Johann & Son, Inc.	2021 W. Decorah Road	City of West Bend	0046515	267115750	2907	No
--		West Bend Sand & Stone, Inc.	4246 Hwy 33	City of West Bend	0046515	267105960	2904	No
	Petroleum Contaminated Water ^b							
--	Pit/Trench Dredging	ANR Pipeline Kewaskum Loop	T11N R20E Section 19 NE NE	Town of Trenton	0049344		29927	No
--		Wondra Excavating, Inc.		Washington County	0049344		19633	No
--	Potable Water Treatment and Conditioning	Weasler Engineering, Inc.	7801 Hwy 45	Town of Barton	0046540	267019610	1760	No
--	Swimming Pool Facilities	Cedaqua Swimming Pool		City of Cedarburg	0046523		1984	No
--		Cedarburg Community Pool	W68 N851 Evergreen Blvd.	City of Cedarburg	0046523	246105420	14645	No
--		Grafton High School Swimming Pool	1900 Washington Avenue	Village of Grafton	0046523	246072200	14646	No
--		Homestead High School	5000 W. Mequon Road	City of Mequon	0046523	246029190	13729	No
27	Individual Permits	Adell Corporation	627 Maine Street	Village of Adell	0001236	460032760	5623	Yes
28		Cook Composites & Polymers Company	340 Railroad Street	Village of Saukville	0027731	246004330	6198	Yes
--		ITW West Bend Company	400 Washington Street	City of West Bend	0027294	267004640	6178	No ^c
29		Krier Foods, Inc. ^d	520 Wolf Road	Village of Random Lake	0049204	460146280	10134	Yes
29		Lakeside Foods, Inc. ^d	709 Allen Street	Village of Random Lake	0032760	460034850	8623	Yes
30		Level Valley Creamery, Inc.	807 Pleasant Valley Road	City of West Bend	0026751	267030280	6152	Yes
33		Northland Cranberries ^e	N168 W20701 Main Street	Village of Jackson		267003770	5566	Yes

Table 11 (continued)

Number on Map 2	Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
31		Regal Ware, Inc.	1675 Reigle Drive	Village of Kewaskum	0000060	267003660	5555	Yes
--		Wisconsin Department of Natural Resources Kettle Moraine Springs Fish Hatchery	N1929 Trout Springs Road	Village of Adell	0026255	460033750	7297	No ^c

^aFID and FIN are facility identification numbers used in Wisconsin Department of Natural Resources databases.

^bThere were no active WPDES general permits for Petroleum Contaminated Water in the Milwaukee River Watershed during February 2003.

^cData for this facility were not available.

^dThe name of this facility has changed to Lakeside Foods, 709 Allen Street Random Lake. Field checking indicates that these are the same building

^eThe Northland Cranberries bottling plant in Jackson closed on November 21, 2003 and was subsequently sold.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 12

KNOWN POINT SOURCE DISCHARGES IN THE ROOT RIVER WATERSHED: FEBRUARY 2003

Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
Carriage/Interstitial Water from Dredging ^b	--	--	--	--	--	--	--
Concrete Products Operations	Central Ready Mix LP, Caledonia	911 Highway 41	Town of Caledonia	0046507	252028920	12818	No
	Gleason Ready Mix	5255 Phillips Avenue	City of Racine	0046507	252147280	12819	No
	Hales Corners Block Company, Raynor	8222 Raynor Avenue	City of Racine	0046507	252147390	12820	No
Contaminated Groundwater Remedial Actions	Bob's Mobil, Inc.	740 S. Main Street	Village of Union Grove	0046566	252060490	14634	No
Discharge to Subsurface Absorption System	Harry Hansen Meat Service	10407 Highway K	Town of Raymond	0055611	252008570	7009	No
Hydrostatic Test Water and Water Supply System	Caddy Vista Sanitary District	10201 Caddy Lane	Town of Caledonia	0057681	252002740	6329	No
	Caledonia Sewer UD #1	6922 Nicholson Road	Town of Caledonia	0057681	252018470	18615	No
	Southern Wisconsin Center for the Developmentally Disabled	21425 Spring Street	Village of Union Grove	0057681	252019900	19016	No
	Village of Union Grove	1015 State Street	Village of Union Grove	0057681	252020010	19015	No
Land Applying Liquid Industrial Wastes	Harry Hansen Meat Service	10407 Highway K	Town of Raymond	0055867	252008570	7009	No
Land Applying Food Process By-Products Solids	Harry Hansen Meat Service	10407 Highway K	Town of Raymond	0057665	252008570	7009	No
Land Applying Sludge	Harry Hansen Meat Service	10407 Highway K	Town of Raymond	0057657	252008570	7009	No
Noncontact Cooling Water	In Sink Erator Division Emerson	4700 21st Street	City of Racine	0044938	252004940	2103	Yes
	Pen and Inc of Milwaukee	9860 S. Franklin Drive	City of Franklin	0044938	241912990	22504	Yes
	Plastic Parts, Inc.	1300 Industrial Park Drive	Village of Union Grove	0044938	252007360	12988	Yes
	Printing Developments, Inc.	2010 Indiana Street	City of Racine	0044938	252007580	989	Yes
	Racine Heat Treating Company, Inc.	1215 8th Street	City of Racine	0044938	252014510	1176	Yes
	Twin Disc, Inc., Plant 1	1328 Racine Street	City of Racine	0044938	252007030	6597	Yes

Table 12 (continued)

Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
Nonmetallic Mining Operations	--	--	--	--	--	--	--
Petroleum Contaminated Water	--	--	--	--	--	--	--
Pit/Trench Dredging ^c	--	--	--	--	--	--	--
Potable Water Treatment and Conditioning	--	--	--	--	--	--	--
Swimming Pool Facilities	--	--	--	--	--	--	--
Individual Permits	PPG Industries, Inc.	10800 S. 13th Street	City of Oak Creek	29149	241014620	6269	Yes
	Viasystems Milwaukee, Inc.	S. Howell Avenue	City of Oak Creek	46493	241116700	6876	Yes

^aFID and FIN are facility identification numbers used in Wisconsin Department of Natural Resources databases.

^bThere were no active WPDES general permits for Carriage/Interstitial Water from Dredging in the Root River Watershed during February 2003.

^cThere were no active WPDES general permits for Pit/Trench Dredging in the Root River Watershed during February 2003

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 13

KNOWN POINT SOURCE DISCHARGES IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA: FEBRUARY 2003

Permit Type	Facility	Address	Municipality	WPDES Permit Number	FID ^a	FIN ^a	Modeled
Carriage/Interstitial Water from Dredging ^b	--	--	--	--	--	--	--
Concrete Products Operations ^c	--	--	--	--	--	--	--
Contaminated Groundwater Remedial Actions ^d	--	--	--	--	--	--	--
Hydrostatic Test Water and Water Supply System	Crestview Sanitary District	3120 Indian Trail	City of Racine	0057681	252086340	7308	No
	North Park Sanitary District	333 4 1/2 Mile Road	Town of Caledonia	0057681	252003180	6009	No
	South Milwaukee Water Utility	100 Marshall Avenue	City of South Milwaukee	0057681	241014400	6212	No
	Village of Wind Point Water Utility	215 E. Four Mile Road	Village of Wind Point	0057681		23654	No
Land Applying Liquid Industrial Wastes ^e	--	--	--	--	--	--	--
Noncontact Cooling Water	S. C. Johnson and Son, Inc.	15 Four Mile Road	City of Racine	0044938	252083040	20553	No
	Twin Disc, Inc., Plant 3	4601 21st Street	City of Racine	0044938	252007140	2515	Yes
Nonmetallic Mining Operations ^f	Vulcan Materials Company, Racine	1501 Three Mile Road	City of Racine	0046515	252004480	3443	No
Petroleum Contaminated Water ^g	--	--	--	--	--	--	--
Pit/Trench Dredging ^h	--	--	--	--	--	--	--
Potable Water Treatment and Conditioning ⁱ	--	--	--	--	--	--	--
Swimming Pool Facilities ^j	--	--	--	--	--	--	--
Individual Permits ^k	--	--	--	--	--	--	--

Table 13 Footnotes

^aFID and FIN are facility identification numbers used in Wisconsin Department of Natural Resources databases.

^bThere were no active WPDES general permits for Carriage/Interstitial Water from Dredging in the Lake Michigan Direct Drainage Area during February 2003.

^cThere were no active WPDES general permits for Concrete Product Operations in the Lake Michigan Direct Drainage Area during February 2003.

^dThere were no active WPDES general permits for Contaminated Groundwater Remedial Actions in the Lake Michigan Direct Drainage Area during February 2003.

^eThere were no active WPDES general permits for Land Applying Liquid Industrial Wastes in the Lake Michigan Direct Drainage Area during February 2003.

^fThere were no active WPDES general permits for Nonmetallic Minings in the Lake Michigan Direct Drainage Area during February 2003.

^gThere were no active WPDES general permits for Petroleum Contaminated Water in the Lake Michigan Direct Drainage Area during February 2003.

^hThere were no active WPDES general permits for Pit/Trench Dredging in the Lake Michigan Direct Drainage Area during February 2003

ⁱThere were no active WPDES general permits for Potable Water Treatment and Conditioning in the Lake Michigan Direct Drainage Area during February 2003

^jThere were no active WPDES general permits for Swimming Pool Facilities in the Lake Michigan Direct Drainage Area during February 2003

^kThere were no active WPDES Individual permits in the Lake Michigan Direct Drainage Area during February 2003

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 14 (continued)

Facility	Permit Type	Flow	BOD		TSS		Total Phosphorus		Ammonia-Nitrogen		Fecal Coliform	Copper		Dissolved Oxygen	Temperature
		Mean (mgd)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Mean (°F)
Tecumseh Products ^a	Noncontact cooling water	0.01	0.05 ^b	19 ^b	--	--	<0.01	0.40	0.01	4.00	--	--	--	--	76.7
Universal Strap ^a	Noncontact cooling water	<0.01	0.03 ^b	11 ^b	0.01 ^b	5 ^b	--	--	<0.01	1.00	--	--	--	--	87.5
Vishay Ceramite	Noncontact cooling water	0.01	0.13 ^b	46	--	--	0.02	8.00	<0.01	0.90	--	--	--	--	73.4
Weasler Engineering ^a	Noncontact cooling water	0.04	1.47 ^b	536 ^b	--	--	0.02 ^b	6.00 ^b	0.02 ^b	6.00 ^b	--	--	--	--	56.8

^aData are from 2001.

^bMonitoring data were below the limit of detection. One-half the detection limit was used for purposes of water quality modeling.

^cThe Northland Cranberries bottling plant closed November 21, 2003.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 15

POLLUTANT LOADING AND WATER QUALITY PARAMETERS FOR POINT SOURCES IN THE LOWER ROOT RIVER WATERSHED: 2002

Facility	Permit Type	Flow	BOD5		TSS		Total Phosphorus		Ammonia-Nitrogen		Fecal Coliform	Copper		Dissolved Oxygen	Temperature
		Mean (MGD)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Mean (°F)
InSink Erator Outfall 001	Noncontact cooling water	0.09	0.46 ^a	168 ^a	--	--	0.18	67.00	<0.01 ^a	1.0 ^a	--	--	--	--	63.3
InSink Erator Outfall 002	Noncontact cooling water	0.13	0.06 ^a	23	--	--	0.13	45.00	0.05 ^a	19.0 ^a	--	--	--	--	65.0
Pen & Inc.	Noncontact cooling water	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	71.0
Plastic Parts	Noncontact cooling water	<0.01	0.01 ^a	5 ^a	--	--	<0.010 ^a	0.01 ^a	<0.01 ^a	0.4	--	--	--	--	64.5
PPG Industries Outfall 001	Individual	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--
PPG Industries Outfall 002	Individual	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--
PPG Industries Outfall 003	Individual	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--
Printing Development	Noncontact cooling water	0.04	0.37 ^a	134 ^a	1.38	504	0.083	30.00	0.55 ^a	202.0	--	--	--	--	64.0
Racine Heat Treating	Noncontact cooling water	0.08	--	--	--	--	--	--	--	--	--	--	--	--	72.0
Twin Disc	Noncontact cooling water	<0.01	0.07 ^a	27 ^a	0.43	157	0.001 ^a	0.40 ^a	<0.01 ^a	0.7	--	--	--	--	76.8
Viasystems	Individual	0.09	--	--	--	--	--	--	--	--	--	0.01	3	--	52.3

^aMonitoring data were below the limit of detection. One-half the detection limit was used for purposes of water quality modeling.

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 16

POLLUTANT LOADING AND WATER QUALITY PARAMETERS FOR POINT SOURCES IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA: 2002

		Flow	BOD5		TSS		Total Phospho rus		Ammoni a- Nitrogen		Fecal Coliform	Copper		Dissolved Oxygen	Temperature
Facility	Permit Type	Mean (MGD)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Mean (per 100 ml)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Mean (°F)
Twin Disc Outfall 2 ^a	Noncontact Cooling Water	0.02	0.29 ^b	104 ^b	1.90	692	<0.01 ^b	2 ^b	0.86 ^b	313 ^b	--	--	--	--	76.3

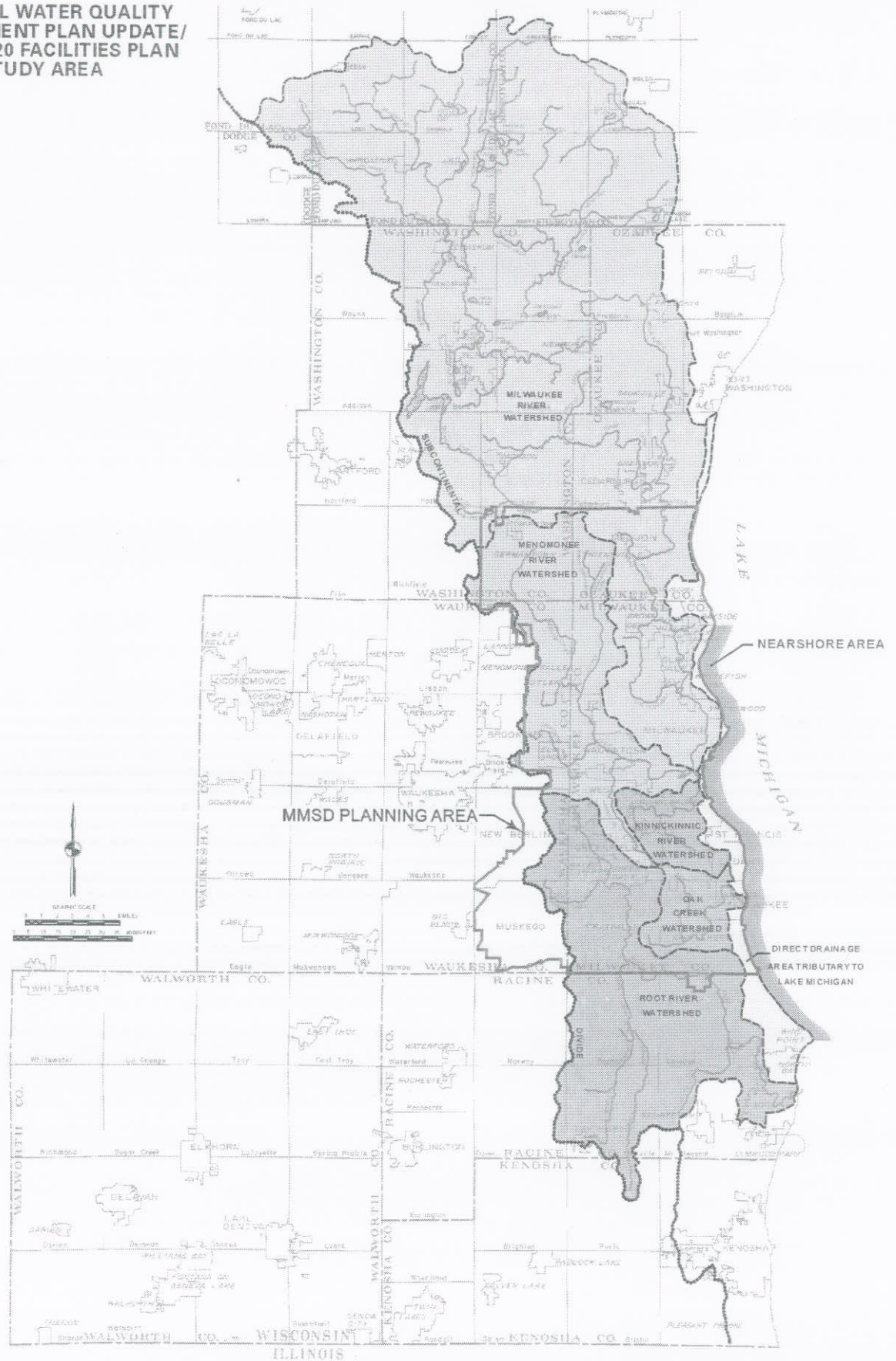
^aData are also available for 2003.

^bMonitoring data were below the limit of detection. One-half the detection limit was used for purposes of water quality modeling.

Source: Wisconsin Department of Natural Resources and SEWRPC.

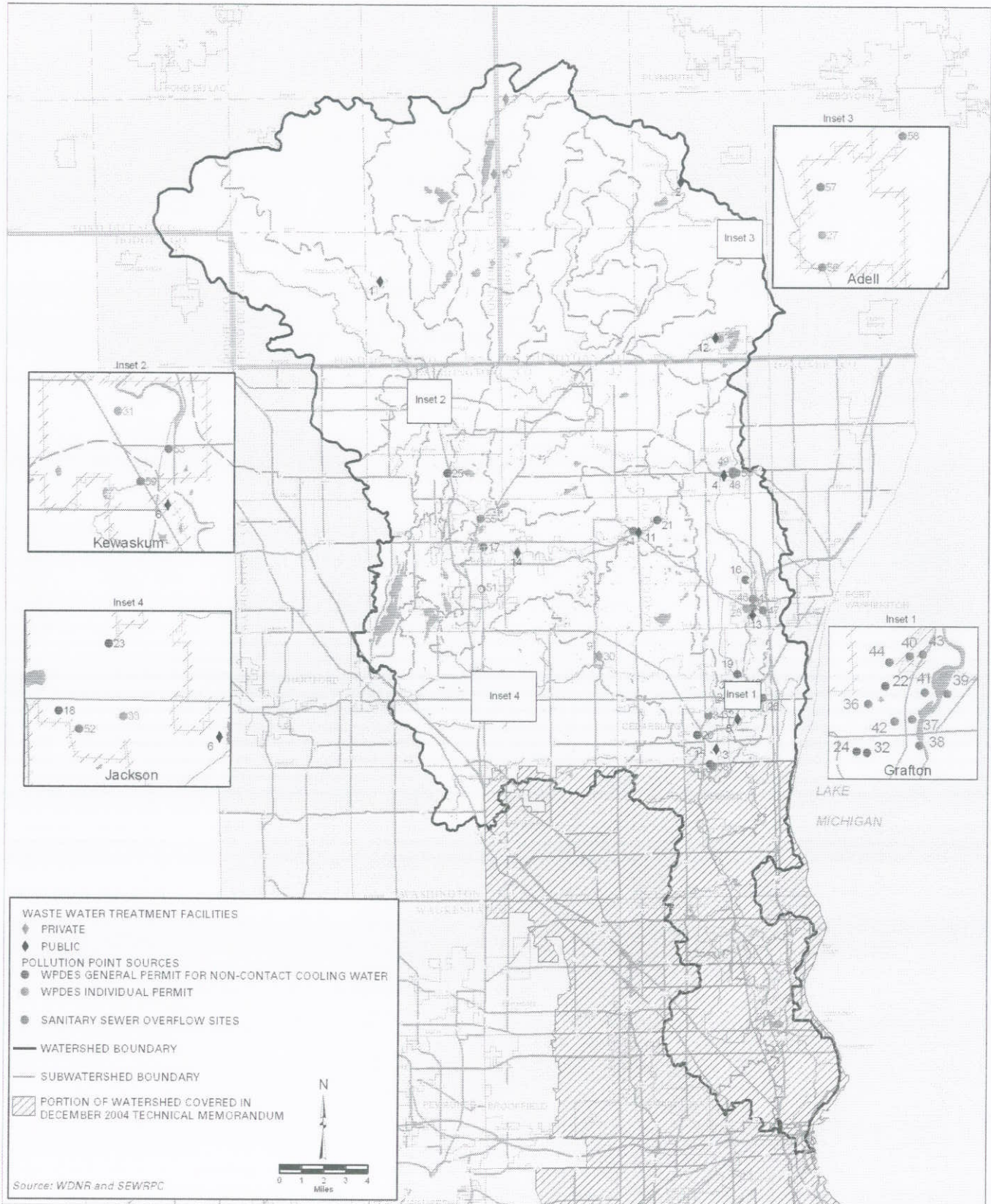
Map 1

REGIONAL WATER QUALITY
MANAGEMENT PLAN UPDATE/
MMSD 2020 FACILITIES PLAN
STUDY AREA



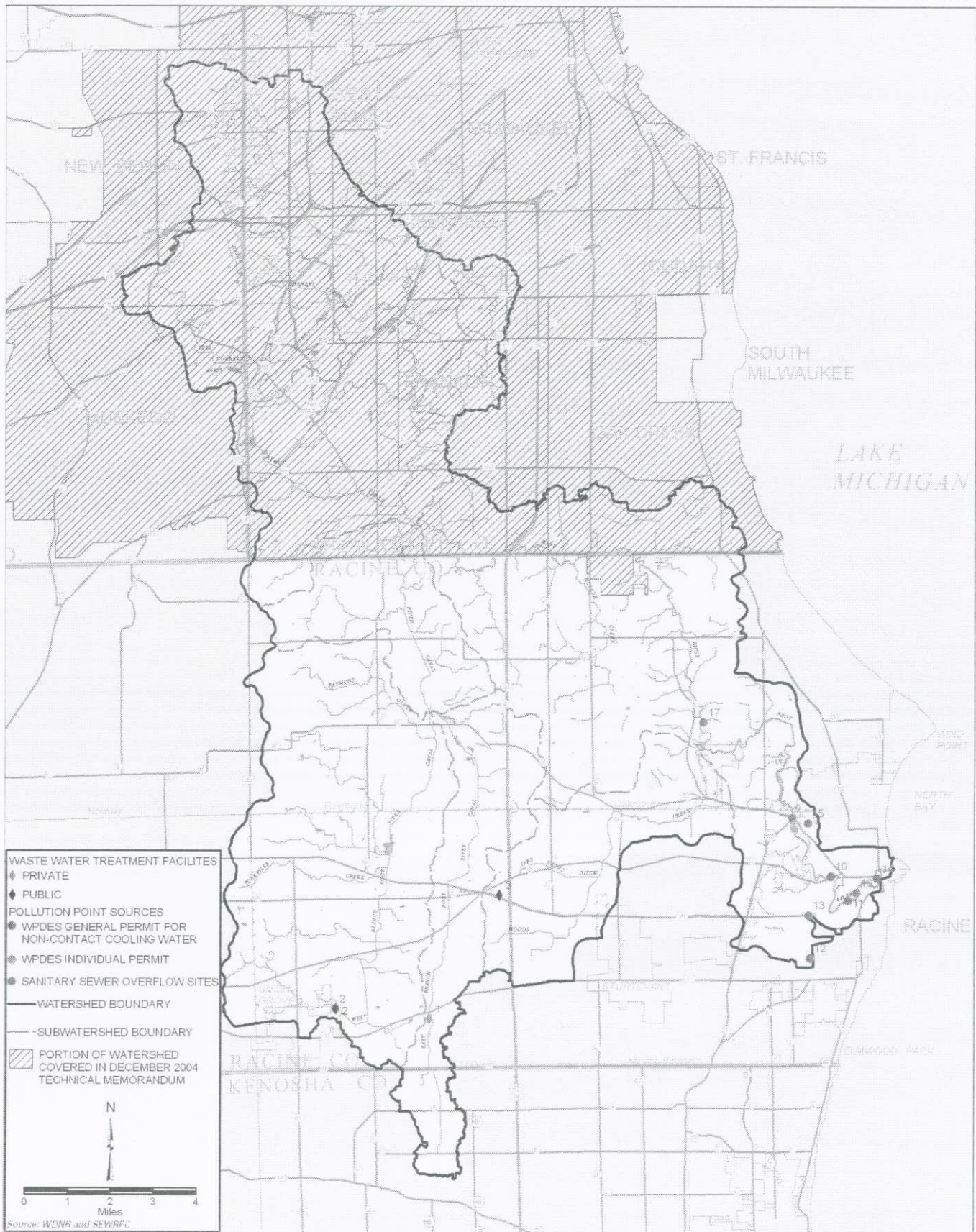
Map 2

**POINT SOURCES OF WATER POLLUTION
IN THE UPPER MILWAUKEE RIVER WATERSHED USED FOR WATERCOURSE MODELING: 2004**



Map 3

POINT SOURCES OF WATER POLLUTION IN THE ROOT RIVER WATERSHED USED FOR WATERCOURSE MODELING: 2004



Map 4

POINT SOURCES OF WATER POLLUTION IN THE LAKE MICHIGAN DIRECT DRAINAGE AREA USED FOR WATERCOURSE MODELING: 2004



