

MINUTES

SEWRPC ADVISORY COMMITTEE ON REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE FOR THE GREATER MILWAUKEE WATERSHEDS

DATE: March 23, 2005
TIME: 1:30 p.m.
PLACE: City of Mequon City Hall
Upper Level Council Chambers
11333 N. Cedarburg Road
Mequon, Wisconsin

Committee Members Present

Daniel S. Schmidt, Chairman	Village of Kewaskum/SEWRPC Commissioner
Robert P. Biebel, Secretary	Southeastern Wisconsin Regional Planning Commission Staff
Julie A. Anderson	Racine County
Michael Ballweg	UW-Extension, Sheboygan County
John R. Behrens	Silver Lake Protection and Rehabilitation District
John M. Bennett	City of Franklin
Thomas J. Bunker	City of Racine Water and Wastewater Utility
Shannon K. Haydin	Sheboygan County Planning
Judy Jooss	Town and Country Resource Conservation Develop, Inc.
Mark Lloyd (for William J. Hoppe)	City of Mequon
Kristine M. Krause	We Energies
Charles J. Krohn	Wisconsin Department of Natural Resources
James Lubner	UW Sea Grant Institute
Daniel J. Lynch	Natural Resources Conservation Service
Jeffrey J. Mantes	City of Milwaukee
Paul E. Mueller	Washington County Planning and Parks Department
Matthew Moroney	Metropolitan Builders Association
Cheryl Nenn	Friends of Milwaukee's Rivers
Jeffrey S. Nettesheim	Village of Menomonee Falls
Stephen Poloncsik (for Peter G. Swenson)	U.S. Environmental Protection Agency
Kevin L. Shafer	Milwaukee Metropolitan Sewerage District
Thomas A. Wiza	City of Cedarburg

Staff Members and Guests

Troy E. Deibert	HNTB Corporation
Michael G. Hahn	Southeastern Wisconsin Regional Planning Commission

WELCOME AND INTRODUCTIONS

Mr. Schmidt thanked the Advisory Committee members for attending this meeting, noting that this was the first Committee meeting of 2005. He indicated that roll call would be accomplished with a sign-in sheet circulated by Commission staff and he then asked each of the members and guests to introduce themselves.

APPROVAL OF MINUTES OF THE MEETING OF DECEMBER 15, 2004

Mr. Schmidt noted that Mr. Biebel had one item to discuss related directly to the minutes. Mr. Biebel referred to the text relating to Appendix VII-1 on page 5 of the minutes. He reminded the Committee that there had been a substantial number of comments on the standards set forth in that appendix and that many of the standards were related to land use and park and open space objectives. He reported that the comments had been documented and were reported to the SEWRPC land use planning team that is currently in the process of developing standards for use in the new regional land use plan with guidance from the Regional Land Use Planning Advisory Committee. He noted that the land use planning process would be a better forum to address most of the comments received at the last meeting, given the nature of the comments being largely land use-related. He indicated that once the land use planning process to develop revised standards was completed, in about 60 to 90 days, a revised copy of Appendix VII-1 would be provided to the Committee.

Mr. Schmidt then asked if there were any additions or revisions to be made to the minutes of the December 15, 2004, meeting of the Committee. There being no additions or revisions, the minutes were approved, on a motion by Mr. Nettesheim, seconded by Mr. Behrens, and carried unanimously.

CONSIDERATION OF CHAPTER II, "DESCRIPTION OF THE STUDY AREA"

At Mr. Schmidt's request, Mr. Biebel used PowerPoint slides to illustrate the planning process and the place in the process that Chapter II of the planning report fits.

Mr. Schmidt then asked Mr. Hahn to review the preliminary draft of Chapter II, "Description of the Study Area." Mr. Hahn indicated that he would highlight selected portions of the chapter and encouraged the Committee members to raise comments and questions on a page-by-page basis, as had been done at the previous meeting.

Mr. Behrens reported, and it was duly noted, that the word "watershed" should be added after the words "Milwaukee River" in the fifth line of the second paragraph on page 11. It was also noted that the words "and is" should be deleted in the eighth line of the same paragraph.

Mr. Hahn noted that there have been minor changes to Maps 2, 7, and 9, and that revised copies of those maps had been distributed.

[Secretary's Note: There have been other minor revisions to the maps in Chapter II. The revised maps can be viewed on the copy of the chapter posted on the SEWRPC web site.]

Mr. Wiza referred to Map 2 illustrating civil division boundaries and asked if those boundaries would be updated when changes in civil division boundaries occurred recently. Mr. Biebel reported that the civil division boundaries included were based upon year 2000 conditions and that it would be some time before those boundaries would be updated to 2005 conditions. He indicated that if there were any major boundary changes that had occurred, it may be possible to adjust the map for specific communities if the information were reported to the staff. It was also noted that the year 2000 should be placed at the end of the title for Table 1.

Mr. Bennett asked for a clarification on the relationship between population and households and household size in Table 2. Mr. Biebel noted that the population number included persons who were termed "group quartered" who do not live in households. The group quartered population level is subtracted from the total population and this net population value is then divided by the number of households to obtain the average household size.

Mr. Krohn referred to the fourth paragraph on page 19 and suggested the first sentence be revised.

[Secretary's Note: The first sentence of the fourth paragraph on page 19 was revised as follows:

“An important concept underlying the watershed planning effort is that land use development should be planned considering the ability of the underlying natural resource base to sustain such development.”]

In response to Mr. Lynch’s question, it was noted that on page 19, the employment levels reported were a combination of both full-time and part-time jobs.

Mr. Krohn referred to Map 4 on page 25, showing existing land uses in the study area, and noted that there appeared to be areas which were either multi-family or single-family residential areas, but appeared to be a darker color than yellow or orange that would be illustrative of residential land uses. He noted two examples, one in Shorewood and one in Whitefish Bay. It was agreed to investigate the issue.

[Secretary’s Note: Upon investigation, it was found that the areas in question were relatively high-density residential areas, with small blocks and a tight density of streets. The tight street pattern shows up as dark brown or grey because of the relatively small scale of the maps. This will be rectified in the final report printing. When Chapter II is placed upon the SEWRPC web site, changes will be made to resolve this problem.]

Mr. Lubner referred to Table 12 on page 37 and noted that the term “Lizard Mound State Park” was used in the listing of historic sites, while in Table 11 on page 33, which identifies recreation and open space sites, noted the Lizard Mound Park to be a county park. He suggested the data bases used be checked.

[Secretary’s Note: A review indicates that the Lizard Mound Park is currently a county park. The park was established in 1950 as a State park. The site was added to the National Register of Historic Places in 1970. In 1986, the park was acquired from the State by Washington County. The source of the data in Table 12 is the most recent 2005 National Register of Historic Places maintained by the National Park Service which incorrectly continues to list the site as the “Lizard Mound State Park,” even though the State Historical Society listing refers to the site as a county park. The name in Table 12 has been corrected to read “Lizard Mound County Park” and a footnote has been added to indicate variance from the National Register of Historic Places.]

Ms. Nenn referred to Table 18 on page 53, and asked if the Omega Hills landfill in the Village of Germantown was still active. It was not listed as such in Table 18. It was agreed to check on that landfill’s status.

[Secretary’s Note: Review of more-detailed data indicates that the Omega Hills North landfill which was located in the extreme southeastern portion of the Village of Germantown, is currently inactive, having last received waste in 1989. The Boundary Road landfill and Parkview landfill, both in the Village of Menomonee Falls, are two other inactive landfill sites located immediately to the south of the Omega Hills North landfill. The only active landfill site in that area is the Orchard Ridge Recycling and Disposal site in the Village of Menomonee Falls.

Following the meeting, Mr. Nettesheim reported that the Orchard Ridge Recycling and Disposal facility was in the planning and approval process for an expansion of that facility. Table 18 has been footnoted to reflect this.]

With regard to Table 18 and Map 11, which lists and illustrates the active landfill sites, Mr. Mueller noted that there were many other landfill sites which had been operated in the study area which could have a bearing on water resources planning, even though they were now inactive. Mr. Biebel indicated that the section of Chapter II was related to existing utility systems and it had been decided to present the inventory of landfills in the companion technical report on water quality and sources of pollution. The sources of pollution information from

that report will be summarized in Chapter IV of the planning report. Mr. Krohn reported that the Wisconsin Department of Natural Resources (WDNR) maintained an inventory of the active and inactive landfill sites which could be accessed. It was agreed that the landfill sites, including the inactive sites, would be mapped as part of the sources of pollution inventory for the companion technical report. It was also agreed to add a sentence to the text to explain this.

[Secretary's Note: The following sentence was added to the end of the first partial paragraph on page 52:

“An inventory of all of the landfills in the study area, including both active and inactive sites, is included in a technical report which supplements this planning report. That information is summarized in Chapter IV of this report.”]

Messrs. Wiza and Lloyd referred to Table 17 on page 52 and noted that the Village of Bayside should be added to the Northshore Group permittees and that the City of Cedarburg had obtained its permit individually. Mr. Behrens noted that the “Village” of Grafton was the proper name for the for the first community in Table 17. These changes were duly noted.

There was considerable discussion regarding the difference in weather stations noted on Map 12 and Table 19. Mr. Biebel indicated that the stations shown on Map 12 were those specifically used for water quality modeling purposes. Table 19 listed a somewhat different set of stations to statistically analyze climatological data over the study area. He noted that the stations set forth in Table 19 were selected to provide a somewhat broader coverage of the study area, particularly in a north-south direction.

Mr. Bunker noted that there was a fairly extensive section of the chapter on climate. He suggested, and it was generally agreed, to add a section on air quality.

[Secretary's Note: A section on air quality proposed to be inserted in the text following the first full paragraph on page 64 is attached hereto as Exhibit A.]

Mr. Moroney suggested, and it was generally agreed, to delete the last two sentences in the third full paragraph on page 76, as these sentences were in the form of recommendations, as opposed to inventory information.

Mr. Krohn referred to page 80 and suggested additional factors listed in terms of limitations to the use of groundwater.

[Secretary's Note: The following sentence was added to the end of the first full paragraph on page 80:

“Other considerations which may limit the uses of groundwater include decreasing aquifer levels and increasing concentrations of dissolved solids and other constituents.”]

There was a discussion regarding the naming of the Milwaukee River East and West Branches, as shown on Map 17. The mapping designation was deemed to be correct.

Mr. Bunker referred to the section of the chapter on fisheries beginning on page 80 and recommended a reference be made to the high-quality anadromous fishery in the Root River. Mr. Krohn also reported on the walleye and sturgeon stocking in the Milwaukee River.

[Secretary's Note: A new paragraph has been added to the text following the first partial paragraph on page 82 and is attached hereto as Exhibit B.]

At Mr. Krohn's suggestions, the words "and have been delineated by the Southeastern Wisconsin Regional Planning Commission.¹⁹" were inserted to replace the words "by the Commission.¹⁹" at the end of the third full paragraph on page 86.

Mr. Lubner suggested that the report include a description of the North Branch of the Milwaukee River Wildlife and Farming Heritage Area currently being developed by the WDNR.

[Secretary's Note: A paragraph has been added to the text under the subheading Wisconsin Department of Natural Resources on page 27 to describe the North Branch of the Milwaukee River Wildlife and Farming Heritage Area. That paragraph is attached hereto as Exhibit C.]

There were a number of typographical and clarification items noted at the meeting or by copy of edited chapters provided after the meeting. These were duly noted.

There being no further discussion, a motion to approve preliminary draft Chapter II, "Description of the Study Area," as amended was made by Mr. Moroney, seconded by Mr. Bunker, and carried unanimously by the Committee.

[Secretary's Note: Subsequent to the meeting, Mr. Charles Peters, by e-mail correspondence, noted that he had been unable to attend the meeting and had two recommendations for additions to Chapter II. A copy of Mr. Peters' e-mail correspondence is attached hereto as Exhibit D. The additions recommended were to: 1) include text on the linkage between groundwater and surface water and 2) include text on the issue of water use and availability.

In response to Mr. Peters' first recommendation, the heading entitled "Surface Water Resources" on page 73, has been changed to "Surface Water and Groundwater Resources" and the order of the heading entitled "Geology and Groundwater Resources" on page 77 was changed from a second order heading to a third order heading.

In addition, the first paragraph under the revised heading "Surface Water and Groundwater Resources" on page 73 was revised to read as shown in Exhibit E.

In response to Mr. Peters' second recommendation, the section of the chapter covering water supply facilities on page 34 has been expanded as set forth in Exhibit F.]

REPORT ON WATER QUALITY MODELING ACTIVITIES SUPPORTING THE PLANNING PROGRAM

At Mr. Schmidt's request, Mr. Biebel then summarized the water quality modeling activities currently underway for the planning program.

[Secretary's Note: The PowerPoint presentation utilized to present this item is attached hereto as Exhibit G.]

DETERMINATION OF NEXT MEETING DATE AND LOCATION

The next meeting of the Advisory Committee was tentatively scheduled for May 25, 2005, at 1:30 p.m. at the Mequon City Hall in the upstairs Council Chambers.

ADJOURNMENT

The March 23, 2005, meeting of the Advisory Committee on the regional water quality management plan update was adjourned at 3:05 p.m. on a motion by Mr. Bennett, seconded by Ms. Anderson, and carried unanimously by the Committee.

* * *

#106415 V1 - RWQMP UPDATE MINUTES 03/23/05

RPB/pk

04/12/05

Exhibit A

Air Quality

Air quality is an important determinant of the quality of life and the economy in the study area. In addition, surface water quality can be directly or indirectly impacted by air quality. Because of these considerations, this section of the report summarizes the current air quality conditions and programs most directly impacting the study area. However, it should be recognized that air quality problem resolution is not being specifically addressed in this planning program.

In accordance with the requirements of the Clean Air Act, the USEPA has set national ambient air quality standards (NAAQS) for six criteria pollutants, including carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM), ozone (O₃), and sulfur dioxide (SO₂), which are considered harmful to public health and the environment. The WDNR, in cooperation with the USEPA, conducts a comprehensive air quality management program designed to meet these standards and to otherwise protect air quality in the State. The WDNR air management program includes operation of a network of air quality monitors and a series of rules that limit emission for air pollution sources based upon various criteria. To ensure facilities meet their emission limits, the WDNR uses tools, such as air pollution control permits, compliance inspections, emission testing, and emission reports and certifications.

Areas not meeting the NAAQS for one or all of the criteria pollutants are designated as nonattainment areas by the USEPA. In areas where observed pollutant levels exceed the established NAAQS, and are designated as “nonattainment” areas by the USEPA, growth and development patterns may be constrained. For example, industry seeking to locate or expand in a designated nonattainment area, or close enough to impact upon it, must apply special emission control technologies. In addition, new or expanding industries may be required to obtain a greater than one-for-one reduction in emissions from other sources in the vicinity so as to provide a net improvement in ambient air quality or to purchase emission offset credits. In order to change a designation as a nonattainment area, it is necessary to demonstrate compliance with the NAAQS and petition the USEPA for redesignation of the nonattainment areas.

All of the study area currently meets all NAAQS, with the exception of the ozone standards in portions of the study area. Because of standard exceedences, the USEPA has designated seven counties within, or partially within, the study area as ozone nonattainment areas. These counties include Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha Counties.

Ozone is formed when precursor pollutants, such as volatile organic compounds and nitrogen oxides, react in the presence of sunlight. The ozone air quality problem within the seven counties of the study area is a complex problem because ozone is meteorologically dependant. Peak ozone levels typically occur during hot and dry summer-time conditions. In addition, the ozone problem in a portion of the study area is believed to be attributable in large part to precursor emissions which are generated in the large urban areas located to the south and southeast and carried by prevailing winds into the study area. The full resolution of the ozone problem, thus, remains beyond the control of the study area and State and can be effectively addressed only through a multi-state abatement effort. Over the past decade, the combination of local controls and offsets implemented within and external to the seven counties noted, along with national vehicle emissions control requirements, have resulted in a significant improvement in ambient air quality, and projections of future emissions indicate a continued decline in precursor emissions and a continued improvement in air quality.

The ozone levels in the State of Wisconsin, which are relatable to the USEPA eight-hour standard, are shown in Figure 6¹ for years 2001 through 2003. The standard was exceeded in all of the counties within the study area which directly border on Lake Michigan, with the levels in the inland counties of Dodge, Fond du Lac, Washington, and Waukesha Counties, not exceeding the standard. Similar data are not yet available for the years 2002 through 2004. However, the summer of 2004 was cooler and, thus, the values for 2002 through 2004 are lower.

In addition to the pollutants discussed above, atmosphere mercury is an important pollutant because of its potential public health risks. The health risks include those associated with fish consumption advisories which are in place for most of the surface waters in the State of Wisconsin. The WDNR has established mercury emission reduction requirements for coal-fired electric utility boilers.

¹*Historically, exceedences of the ozone standards have been considered using both the one-hour and the eight-hour standards established by the USEPA. The one-hour ozone standard will be revoked by the USEPA June 15, 2005, and an eight-hour standard will be effective. The eight-hour standard for ozone is 0.085 ppm and it is calculated as the fourth highest peak daily eight-hour running value for the most recent three consecutive years.*

Figure 6

**ANNUAL AVERAGE FOURTH HIGHEST PEAK DAILY RUNNING EIGHT-HOUR OZONE VALUES
WISCONSIN DEPARTMENT OF NATURAL RESOURCES OZONE MONITORING SITES: 2001-2003**



NOTE: Criteria to attain the eight-hour ozone NAAQS at a site: The average of the annual fourth highest peak daily eight-hour running ozone values for the most recent three consecutive years of data (i.e., Design Value ["DV"]) is less than or equal to 0.08 parts per million (ppm, numerically equivalent to 84 ppb). Sites whose eight-hour O₃ DVs are 84 ppb or less are denoted by white circles on this map. Shaded counties (named in italicized brackets): Counties in which at least one WDNR ozone monitor is located that has an average of its annual fourth highest peak daily eight-hour ozone values for 2001-2003 in excess of the eight-hour ozone NAAQS of 0.08 ppm (84 ppb). These monitoring sites are denoted by dark circles.

^aThe Pleasant Prairie site is also referred to as Chiwaukee.

Source: Wisconsin Department of Natural Resources Bureau of Air Management.

Exhibit B

In addition to resident stream fishes within the river systems themselves, certain fishes including highly sought after game fishes such as walleye, steelhead, and salmon regularly migrate between these streams and Lake Michigan. Typically these migrations occur in spring and fall for breeding purposes, but such migrations may occur at other times of the year depending upon the characteristics of the particular strain. In particular the steelhead fishery in the Root River system provides an example of a highly managed fishery, where multiple strains of steelhead have been introduced to provide a high quality year-round fishery. This fishery is supported by the WDNR Root River Steelhead Facility located in Lincoln Park, Racine County. This facility, established in 1992-93, processes approximately 500,000 steelhead annually, using a system of fish ladders, holding ponds, and laboratory facilities to enhance reproduction. Similarly, the WDNR has actively stocked and continues to manage the anadromous salmon fishery using more traditional stocking techniques in other stream systems tributary to Lake Michigan including the Milwaukee River. Recently these programs have been expanded to include the stocking of lake sturgeon which historically were known to be present in this River system. The net result of all of these programs is a restored fishery that has contributed to a significantly improved recreational sport fishing in the Lake and its tributary stream systems.

The fishery and environmental quality of the stream systems is assessed using an Index of Biotic Integrity (IBI)¹ calculated from fish survey data from various sampling locations of the regional water quality management plan update study area watersheds.²

¹Note: Although the fish IBI is useful for assessing environmental quality and biotic integrity in warmwater streams, it is important to note that this index is most effective when used in combination with additional data on physical habitat, water quality, macro-invertebrates, and other biota when evaluating a site.

²John Lyons, "Using the Index of Biotic Integrity (IBI) to Measure Environmental Quality in Warmwater Streams of Wisconsin," United States Department of Agriculture, General Technical Report NC-149, 1992. John Lyons and others, *Development and Validation of an Index of Biotic Integrity for Coldwater Streams in Wisconsin*, North American Journal of Fisheries Management, Volume 16, No. 2, May 1996.

Exhibit C

In addition to the recreation and open space sites listed in Table 11, the Wisconsin Department of Natural Resources has defined the North Branch Milwaukee River Wildlife and Farming Heritage Project Area. Within this area, the Department does not intend to rely as heavily on fee simple acquisition as it does in the other project areas in the study area. Rather, the Department anticipates implementing the long term plan of preserving both natural resource and agricultural lands within the project area through a combination of public ownership, conservation easements, and purchase of development rights. The project area encompasses a 19,500-acre area entirely within the Milwaukee River watershed, as shown on Map 5.

Exhibit D

Robert P. Biebel

From: Charles A Peters [capeters@usgs.gov]
Sent: Monday, April 04, 2005 2:11 PM
To: Robert P. Biebel
Subject: Milwaukee watershed planning

Attachments: pic00041.gif



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Bob,

I'm sorry I missed the meeting in Mequon last week. I had an unanticipated visit to the hospital that day, which resulted in me being home from work all of last week as well. I had a couple comments that I would have relayed at the meeting if I had been able to attend, I hope that they can still be addressed, either in Chapter two or another chapter if more appropriate.

Comment 1: I think that it is important to include a discussion of the linkage between ground water and surface water. As currently written they appear to be two separate resources. I believe that it is very important, in a document such as this, to make it extremely clear that GW and SW are really two expressions of a single resource. I have some verbiage and figures that could help make this connection clear. Additionally, you could probably get much of what you would need from one of these two references:

1) Ground water and surface water; a single resource, Winter, Thomas C.; Harvey, Judson W.; Franke, O. Lehn; Alley, William M., USGS Circular 1139, 1998
<http://pubs.er.usgs.gov/pubs/cir/cir1139>

2) Ground Water Resources in the Great Lakes Basin: The case of Southeastern Wisconsin, Feinstein and others, a www report, <http://wi.water.usgs.gov/glpf/>

Comment 2: I think it is important that the issue of water use and availability be discussed in the regional water quality plan. The water use/availability issue and its attendant gw/sw divide issue is becoming more and more important in SE Wisconsin, including the related water quality degradation issues. This should include current and historic amounts of GW and SW use by various communities. The previously mentioned web based report and the two provided below might provide much of the required information.

1) Ellefson, B.R., Mueller, G.D., and Buchwald, C.A., 2002, Water use in Wisconsin, 2000: U.S. Geological Survey Open-File Report 02-356, 1 sheet.

2) Schneider, M.A., Lutz, M.A., and others, 2003, Water-resources related information for the Milwaukee Metropolitan Sewerage District planning area, Wisconsin, 1970-2002: U.S. Geological Survey Water-Resources Investigations Report 03-4240, 288 p.

All of these reports should be available on-line at:
<http://infotrek.er.usgs.gov/pubs/>

Please let me know if you have any questions. Hope this is helpful.

Charlie

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Exhibit E

Surface Water and Groundwater Resources

Surface water resources, lakes and streams and their associated floodlands, form the most important element of the natural resource base of the regional water quality management plan update study area. Their contribution to the economic development, recreational activity, and aesthetic quality of the watersheds is immeasurable. Lake Michigan is a major source of water for domestic, municipal, and industrial users in the Greater Milwaukee watersheds. Understanding the interaction of the surface water and groundwater resources is essential to sound water resource planning. Both the surface water and the groundwater are interrelated components of the hydrologic system.¹ Accordingly, both these elements of the hydrologic system are described herein. The groundwater resources of the watersheds are hydraulically connected to the surface water resources inasmuch as the former provide the base flow of streams. The groundwater resources constitute the major source of supply for domestic, municipal, and industrial water users located west of the subcontinental divide and are discussed below.

¹*Thomas C. Winter, Judson W. Harvey, O. Lehn Franke, William M. Alley, Ground water and surface water; a single resource, USGS Circular 1139.*

Exhibit F

Water Supply Service

As shown on Map 9, areas served by public water utilities in 2000 encompassed about 256 square miles, or about 23 percent of the total area of the regional water quality management plan study area. An estimated 1,155,683 persons, or about 90 percent of the population of the study area, were served by public water utilities in 2000. In addition, urban areas not served by public water supplies constitute about 61 square miles, or about 5 percent of study area. Municipal water supply facilities in the study area are listed in Table 16.

In addition to publicly owned water utilities, there are numerous privately or cooperatively owned water systems operating in the study area. These water supply systems typically serve residential subdivisions, apartment or condominium developments, mobile home parks, and institutions. The areas served by such systems are shown on Map 9. This map distinguishes those municipal water supply systems which currently utilize Lake Michigan as a source of supply and those systems which utilize groundwater as a source of supply. In addition, all of the study area private water supply systems utilize groundwater as a source of supply.

The entire study area is located within the Great Lakes-St. Lawrence drainage basin. Thus, the use of Lake Michigan as a source of water supply is not a limitation from regulatory and policy considerations. However, given the distance from Lake Michigan and the availability of groundwater resources, much of the study area is expected to continue to rely upon groundwater as a source of supply. Tables 17 and 18 illustrate the water uses and sources of supply for the nine counties within, or partially within, the study area. As can be seen by review of Table 17, the highest use of water within the counties located within, or partially within, the study area is for electric power generation, comprising about 87 percent of the usage. Most of the water used for electric power generation is returned to Lake Michigan following use. As shown in Table 18, about 77 and 96 percent of the public water supplies and total water supplies, respectively, within the counties involved, is obtained from Lake Michigan and 23 and 4 percent of the public water supplies and total water supplies, respectively, is obtained from groundwater.

Table 17

ESTIMATED USE OF WATER WITHIN THE COUNTIES LOCATED WITHIN, OR PARTIALLY WITHIN, THE REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE STUDY AREA (IN MILLION GALLONS PER DAY)^a

County	Domestic	Agricultural	Irrigation	Industrial	Commercial	Thermo-Electric	Public Use and Losses	Total
Dodge	4.03	2.90	0.16	4.06	1.34	0.00	1.76	14.25
Fond du Lac.....	6.06	2.11	0.15	4.82	2.56	22.33	3.37	41.39
Kenosha.....	7.02	0.18	0.25	4.44	2.95	15.21	3.89	33.94
Milwaukee	54.06	0.01	0.81	57.92	33.14	1,867.56	43.60	2,057.10
Ozaukee.....	4.11	0.32	0.51	1.88	1.08	118.78	1.42	128.09
Racine.....	13.00	1.80	2.16	10.82	5.22	0.00	6.87	39.86
Sheboygan	8.12	2.02	0.40	6.21	3.75	487.55	4.94	512.99
Washington	5.64	0.62	0.31	2.55	1.84	2.89	2.42	16.26
Waukesha	14.12	0.27	2.68	9.10	5.07	0.00	6.67	37.90
Total	116.16	10.23	7.43	101.80	56.95	2,514.32	74.94	2,881.78
Percent of Total	4.03	0.35	0.26	3.53	1.98	87.25	2.60	100.00

^aIncludes all water use for the entire counties, including those only partially within the study area.

Source: B.R. Ellefson, G.D. Mueller, and C.A. Buchwald, U.S. Geological Survey, "Water Use in Wisconsin, 2000."

Table 18

ESTIMATED SOURCE OF WATER SUPPLY WITHIN THE COUNTIES LOCATED IN THE REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE STUDY AREA (IN MILLION GALLONS PER DAY)^a

County	Public Water Supply Use ^b			Total Water Use		
	Surface Water	Groundwater	Total	Surface Water	Groundwater	Total
Dodge	0.00	7.04	7.04	0.30	13.95	14.25
Fond du Lac.....	0.00	13.47	13.47	22.52	18.87	41.39
Kenosha.....	15.47	0.08	15.55	31.25	2.69	33.94
Milwaukee	173.65	0.75	174.40	2,050.78	6.32	2,057.10
Ozaukee.....	1.43	4.24	5.67	120.29	7.80	128.09
Racine.....	23.72	3.75	27.47	26.23	13.63	39.86
Sheboygan	15.50	4.26	19.76	503.56	9.43	512.99
Washington	0.00	9.67	9.67	2.96	13.30	16.26
Waukesha	0.00	26.67	26.67	0.34	37.56	37.90
Total	229.77	69.93	299.70	2,758.23	123.55	2,881.78
Percent of Total	76.70	23.30	100.00	95.71	4.29	100.00

^aIncludes all water use for the entire counties, including those only partially within the study area.

^bIncludes water delivered to residents, industry, and commerce within the served area.

Source: B.R. Ellefson, G.D. Mueller, and C.A. Buchwald, U.S. Geological Survey, "Water Use in Wisconsin, 2000."

Exhibit G

REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE

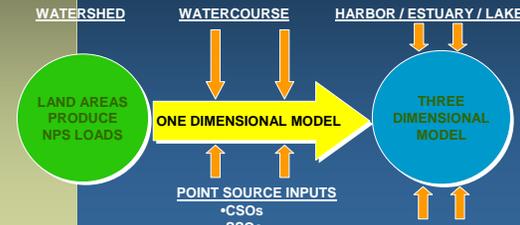
SCENARIOS AND ALTERNATIVE PLAN DEVELOPMENT CONCEPTS AND WATER QUALITY MODELING ACTIVITIES



Presentation for REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE FOR THE GREATER MILWAUKEE WATERSHEDS
Advisory Committee Meeting
March 23, 2005

REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE/ MMSD 2020 FACILITIES PLAN

ELEMENTS OF RECEIVING WATER QUALITY MODELING



WATERSHED WATERCOURSE HARBOR / ESTUARY / LAKE

LAND AREAS PRODUCE NPS LOADS

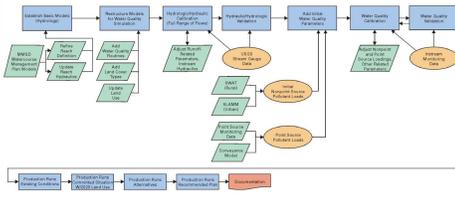
ONE DIMENSIONAL MODEL

THREE DIMENSIONAL MODEL

POINT SOURCE INPUTS
•CSOs
•SSOs
•Industrial
•POTWs

REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE/ MMSD 2020 FACILITIES PLAN

WATERCOURSE WATER QUALITY MODELING TASKS



Initial Data Review (Map/Photo) → Review/Model to Water Quality → Add/Modify/Remove/Adjust Range of Flow → Add/Modify/Remove/Adjust Range of Time → Add/Modify/Remove/Adjust Range of Temperature → Add/Modify/Remove/Adjust Range of Turbidity → Add/Modify/Remove/Adjust Range of Other Parameters → Model Quality Assurance

Legend:
■ MAIN TASK
▨ RELATED PROCESSES
○ GOALS/KEY
□ DOCUMENT

REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE/MMSD 2020 FACILITIES PLAN WATER QUALITY MODELING EXPECTATIONS

- 1. PRIMARY PURPOSE**
 - To Simulate Instream Water Quality Conditions Under Existing, Future, and Alternative Future Pollution Control Level Conditions At a Watershed Systems Level
- 2. ALTERNATIVE AND RECOMMENDED LEVELS OF CONTROL TO BE EVALUATED**
 - Examples: Selected Levels (I.E., 25%, 50%) Reduction in Urban Nonpoint Source and Separately in Rural Nonpoint Sources. Reductions in the Number of SSO and CSO Events and Volume in a Selected Period of Record Changes in Point Source Effluent Conditions
 - Intended to Serve As Basis for EPA TMDL and Evolving Watershed Planning Approach

REGIONAL WATER QUALITY MANAGEMENT PLAN UPDATE/MMSD 2020 FACILITIES PLAN WATER QUALITY MODELING EXPECTATIONS

- 3. RECOMMENDATIONS WILL FOCUS ON LEVELS OF POLLUTION CONTROL NEEDED TO ACHIEVE OBJECTIVES**
- 4. IMPLEMENTATION STEPS**
 - Require Follow-Up Facilities Plan for Sewerage Systems. This is Being Done in Parallel for MMSD Systems to Develop Most Cost-Effective Arrangement of Treatment Units, Storage, Conveyance, Operations, Programs (Such As I/I Removal) to Achieve Level of Control. This Will Need to Be Done for Other Sewerage Systems in the Watersheds, As Needed
 - Requires Follow-Up Detailed Stormwater Management Plans to Develop Site-Specific Facilities Operations and Programs to Achieve Recommended Level of Nonpoint Source Pollution Control in Urban Areas
 - Requires Follow-Up Farm Plans, Integration Into County Land and Water Management Plans to Achieve Recommended Level of Control in Rural Areas

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COLLECTION OF FIELD DATA IN 2004

- Upper Milwaukee River Sampling
- Lower Root River Sampling
- Concurrent MMSD Sampling
- Fate and Transport Study of Bacteria
- Estuary Sediment Oxygen Demand (SOD)
- Receiving Water UOD
- QA/QC of Historic Dissolved Oxygen Data

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WATERCOURSE WATER QUALITY MODELING STATUS

Watershed	Task 1 Model Structure	Task 2 Model Data Sets	Task 3 Hydrology Calibration	Task 4 Quality Calibration	Task 5 Integrate With Estuary/Lake	Task 6 Production Runs	Task 7 Document Results
Kinnickinnic River	Completed	Completed	Completed	Underway	--	--	--
Menomonee River	Completed	Completed	Completed	Being revised	--	--	--
Milwaukee River	Underway	Completed	--	--	--	--	--
Oak Creek	Completed	Completed	Completed	Completed	--	--	--
Root River (upper)	Completed	Completed	--	--	--	--	--
Root River (lower)	Completed	Completed	--	--	--	--	--
Harbor Estuary and Lake Michigan Nearshore	Underway	--	--	--	--	--	--



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EXISTING AND FUTURE CONDITIONS TO BE EVALUATED

Point Sources Outside of MMSD Planning Area	Existing Condition—2000 Base Year & Land Use	Future Conditions—2020 Base Year & Land Use
Public STP	Existing	Effluent Same As Permit Conditions (or existing), Flow Increase for Development
Private STP	Existing	Existing
SSO	Existing	Existing

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EXISTING AND FUTURE CONDITIONS TO BE EVALUATED

Point Sources within MMSD Planning Area	Existing Condition—2000 Base Year & Land Use	Future Conditions—2020 Base Year & Land Use
WWTP	Actual or Modeled Existing	Same As Existing, But with 2020 Flow Increase
SSO & CSOS	Modeled Existing	Modeled Condition with Projected Flow Increase
Sewerage System Facilities	Existing Completed Facilities	Include All Facilities under Construction or in STIP
I/I Assumptions	Existing	Same As Existing with Future I/I Allowance

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EXISTING AND FUTURE CONDITIONS TO BE EVALUATED

Nonpoint Sources	Existing Condition—2000 Base Year & Land Use	Future Conditions—2020 Base Year & Land Use
Urban	Modeled to Account for Existing Stormwater Management System	Existing Practices, Plus Estimated Impact of NR 151 and Chapter 13
Rural	Modeled to Account for Existing Practices	Existing, Plus Estimated Impact of NR 151 and ATCP 50

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EXISTING AND FUTURE CONDITIONS TO BE EVALUATED

	Existing Condition—2000 Base Year & Land Use	Future Conditions—2020 Base Year & Land Use
Watercourse and Stream System	Existing Channel Conditions, Including Recent Construction (Lincoln Creek, Menomonee River Drop Structure, Little Menomonee River)	Same As Existing, Plus Adopted Plan Project Included in Capital Improvements Program
Instream Measures	Continued Dredging of Bottom Sediments for Navigation Purposes	Same As Existing

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EXISTING AND FUTURE CONDITIONS TO BE EVALUATED

Existing Condition—2000 Base Year & Land Use	Future Conditions—2020 Base Year & Land Use
Modeled Condition to Establish Calibration/Validation	Future Conditions Based on Modeled Results Provide Second Basis of Comparison for Scenarios and Alternative Plans
Form One Basis of Comparison for Future Condition, Scenarios, and Alternative Plans	Scenarios Will Be Built Based upon Future Conditions

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SCENARIOS: "BOOKEND" CONDITIONS BUILT ON THE FUTURE SITUATION

- 1A: No SSO and No CSO with CSSA Sewer Separation
- 1B: No SSO and No CSO – No CSSA Sewer Separation
- 1C: No SSO with Increased LOP for CSO
- 2: High Level BMP's

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SCENARIO 1A:

- FPOP's Added to Future Situation
- Elimination of CSO and SSO
- Use of Sewer Separation to the Maximum Practical Extent to Eliminate CSO
- I/I Assumption Same As Future Situation
- All Other Assumptions (nonpoint, etc.) Same As Future 2020 Situation

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SCENARIO 1B:

- FPOP's Added to Future Situation
- Elimination of CSO and SSO
- No Use of Sewer Separation
- I/I Assumption Same As Future Situation
- All Other Assumptions (nonpoint, etc.) Same As Future 2020 Situation

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SCENARIO 1C:

- FPOP's Added to Future Situation
- Elimination of SSO
- No Use of Sewer Separation
- Increased LOP for CSO Based Upon Elimination of SSO
- I/I Assumption Same As Future Situation
- All Other Assumptions (nonpoint, etc.) Same As Future 2020 Situation

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SCENARIO 2:

- FPOP's Added to Future Situation
- No Change for SSO and CSO
- Urban and Rural Nonpoint Same As Future, Plus Higher Level of Nonpoint Source Controls
- I/I Assumption Same As Future Situation
- All Other Assumptions Same As Future Situation



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**FUTURE CONDITION
ALTERNATIVE PLANS**

- To Be Developed Based Upon Technology Analysis and Analysis of Conditions and Scenarios Previously Described



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CONDITIONS AND SCENARIOS MATRIX

Condition	FPOP's	Cost \$\$	Water Quality	Ranking Matrix
Existing				
Future				
Scenario 1A				
Scenario 1B				
Scenario 1C				
Scenario 2				
Alternatives				