MINUTES OF THE FOURTH MEETING
SEWRPC REGIONAL WATER SUPPLY PLANNING ADVISORY COMMITTEE

DATE: April 5, 2006

TIME: 9:30 a.m.

PLACE: Lower Level Conference Room
Regional Planning Commission Offices
W239 N1812 Rockwood Drive
Waukesha, Wisconsin

MEMBERS PRESENT

Kurt W. Bauer, Chairman	Executive Director Emeritus, SEWRPC
Robert P. Biebel, Secretary	Special Projects Environmental Engineer, SEWRPC
Julie A. Anderson	Director, Racine County Division of Planning and Development
Kenneth R. Bradbury	Hydrogeologist/Professor, Wisconsin Geological and Natural History Survey
Thomas J. Bunker	General Manager, Water and Wastewater Utility, City of Racine
Douglas S. Cherkauer	Professor of Geology, University of Wisconsin-Milwaukee
Lisa Conley	Representative, Town and Country Resource Conservation and Development, Inc.
Michael P. Cotter	Director, Walworth County Land Use and Resource Management Department
Charles A. Czarkowski	Regional Water Program Expert, Wisconsin Department of Natural Resources, Southeast Region
Daniel S. Duchniak	General Manager, Waukesha Water Utility, City of Waukesha
Charles P. Dunning	Hydrologist, U.S. Geological Survey
Thomas M. Grisa	Director of Public Works, City of Brookfield
Raymond Grzys	Director of Utilities, City of New Berlin
Jeffrey A. Helmuth	Hydrogeologist Program Coordinator, Wisconsin Department of Natural Resources, Madison
James Kell (for Terrence H. Kiekhaefer)	Department of Public Works, City of West Bend
Carrie M. Lewis	Superintendent, Milwaukee Water Works, City of Milwaukee
Mark Lurvey	Agricultural Business Operator
Patrick T. Marchese	Member, Water Policy Advisory Panel, Public Policy Forum
George E. Melcher	Director, Kenosha County Department of Planning and Development
Matthew Moroney	Executive Director, Metropolitan Builders Association of Greater Milwaukee
Paul E. Mueller	Administrator, Washington County Planning and Parks Department
Michael P. Rau	General Manager, We Energies-Water Services
Edward St. Peter	General Manager, Water Utility, City of Kenosha
Dale R. Shaver	Director, Waukesha County Department of Parks and Land Use
Steven N. Yttri	General Manager, Water and Sewer Utility, City of Oak Creek

MEMBERS EXCUSED OR OTHERWISE ABSENT

Franklyn A. Ericson	Manager, Environmental Operations & Central Services, S. C. Johnson & Son, Inc.
David Ewig	Water Superintendent, City of Port Washington
Andrew A. Holschbach	Director, Ozaukee County Planning, Resources, and Land Management Department
Roger C. Johnson	Manager, North Shore Water Commission
Thomas J. Krueger	Water and Wastewater Utility Director, Village of Grafton
Jeffrey Musche	Administrator/Clerk, Town of Lisbon
James Surfus	Senior Environmental Engineer, Miller Brewing Company
George A. Torres	Director, Transportation & Public Works, Milwaukee County Department of Parks and Public Infrastructure
Daniel S. Winkler	Director of Public Works and Utilities, City of Lake Geneva

GUESTS

Patricia Galle	Government Affairs Associate, Metropolitan Builders Association of Greater Milwaukee
Paul G. Hayes	Mid Kettle Moraine Partners Group
Douglas J. Nelson	Engineer, Ruekert & Mielke, Inc.
James Rowen	Concerned Citizen
Steven H. Schultz	Department Head, Water Supply and Wastewater Treatment, Ruekert & Mielke, Inc.
Rhonda Volz	NR Region Program Manager, Wisconsin Department of Natural Resources

STAFF

Catherine D. West	Planner, Southeastern Wisconsin Regional Planning Commission
Kenneth R. Yunker	Deputy Director, Southeastern Wisconsin Regional Planning Commission

CALL TO ORDER AND ROLL CALL

Chairman Bauer called the meeting to order at 9:30 a.m. Roll call was taken by circulating an attendance signature sheet, and a quorum was declared present.

Chairman Bauer reported that there have been some personnel changes made recently within the Wisconsin Department of Natural Resources Division of Water relevant to the work of this Committee. He asked Mr. Czarkowski to briefly describe the changes and to introduce Ms. Rhonda Volz, the new Wisconsin Department of Natural Resources (WDNR) regional groundwater and drinking water program supervisor.

Mr. Czarkowski noted that in 1997 and 1998 the Wisconsin Department of Natural Resources had reorganized in accordance with a staffing plan based upon watersheds. He noted that recently there had been another reorganization which was based upon a more open staffing arrangement within each WDNR region. He then introduced Ms. Rhonda Volz who, he noted, had previously been a Basin Leader for the Sheboygan River Basin. Ms. Volz reported that she has been following the work of the Committee and indicated that she appreciated the importance of the regional water supply planning program and would

continue to monitor its development. Mr. Czarkowski concluded his presentation by indicating that the Department personnel changes would not result in any changes in the Department representation on the Committee.

Chairman Bauer thanked Mr. Czarkowski and Ms. Volz for their reports and indicated that, while Mr. Czarkowski would apparently continue to serve on the Committee, the Committee would be pleased to have Ms. Volz attend and participate in its meetings whenever such attendance might be convenient for her.

CONSIDERATION OF MINUTES OF THE MEETING OF JANUARY 18, 2006

Chairman Bauer noted that copies of the minutes of the January 18, 2006, meeting of the Regional Water Supply Planning Advisory Committee had been provided, to all members of the Committee for review prior to the meeting, and asked that the Committee consider approval of those minutes.

Chairman Bauer reminded the Committee members that all of the revisions which were requested by the Committee to be made in the materials reviewed at that meeting were intended to be fully documented in the minutes. He reminded the Committee members that approval of the minutes would constitute final approval of the portion of Chapter V, "Planning Objectives, Principles, and Standards," of SEWRPC Planning Report No. 52, which the Committee had reviewed, namely the section entitled "Engineering Design Standards for Water Supply Facilities," pages 5-24 through 5-29. As previously agreed, such approval would be subject to the condition that the Committee would have the ability to reconsider the content of Chapter V in the future if conditions so warranted.

There being no corrections or additions, the minutes of the meeting of January 18, 2006, were approved as published on a motion by Mr. Rau, seconded by Mr. Moroney, and carried unanimously.

CONSIDERATION OF PORTION OF CHAPTER III, "EXISTING WATER SUPPLY CONDITIONS IN THE REGION," OF SEWRPC PLANNING REPORT NO. 52, INCLUDING PAGE 97 THROUGH 138 AND APPENDIX C, "GLOSSARY OF TERMS AND LIST OF ABBREVIATIONS," AND APPENDIX D, "LAKE MICHIGAN WATER TREATMENT PLANT RAW WATER AND FINISHED WATER QUALITY CHARACTERISTICS"

Chairman Bauer then asked the Committee to consider Agenda Item 3. He noted that all Committee members had received a copy of the first parts of the preliminary draft of Chapter III, "Existing Water Supply Conditions in the Region," for review prior to the meeting. He noted that the portion of the Chapter to be reviewed included the sections on the inventory procedures, definition of terms, water supply sources, and on the inventory findings for Kenosha County. He noted that the remainder of the Chapter would consist of documentation of the inventory findings concerning the other six counties of the Region. Those findings would be presented, he said, in the same format as is agreed upon for the Kenosha County section. He also indicated that a summary section would be provided at the end of the Chapter. He then asked Mr. Biebel to review the portions of the Chapter concerned with the Committee on a page-by-page basis.

Mr. Helmuth referred to the first two sentenced on page 97 and questioned the word "network" which he indicated implied interconnected systems. Mr. Biebel noted that there are, in fact, interconnections between some of the systems operating within the Region, but that such interconnections were limited. It was agreed to revise the text by replacing the term "network" with the word "infrastructure" in the first

two sentences on page 97, and by replacing the phrase “this existing network” in the first sentence of the second paragraph on page 97, with the phrase “the existing water supply systems.”

Mr. Grisa referred to the penultimate sentence of the first paragraph on page 97 which referred to the widespread presence of various waterborne diseases in the Region prior to water treatment facilities being developed, and suggested that these diseases had been controlled, in part, through the introduction of sewage treatment facilities. Chairman Bauer responded that the introduction of sewage treatment in the Region had generally preceded the introduction of water treatment facilities by about two decades, and while sewage treatment helped to abate waterborne disease occurrence in the Region, it was not until the widespread introduction of water treatment that such diseases had been largely—although certainly not entirely—eliminated. Upon brief discussion, it was agreed to add the phrase “and sewage” after the word “water” in the penultimate sentence of the first paragraph on page 97.

Mr. Biebel referred to the penultimate sentence in the third paragraph on page 97, and suggested that the phrase “and are summarized on a regional basis” be added at the end of the sentence. The Committee concurred with the suggestion.

Mr. Schultz referred to the first paragraph on page 97, noting that the historical perspective concerned included only accounts of surface water supplied system development. He noted that groundwater supplied systems were in use within the Region at much earlier dates than the surface water supplied systems and suggested references be included to those early groundwater supplied systems. Chairman Bauer agreed, and suggested that a section be developed by the Commission staff on water supply facility history. Upon brief discussion, it was agreed that the Commission staff would develop such a section and include it in the chapter.

[Secretary’s Note: The first paragraph on page 97 has been deleted and a new section entitled “Historical Development of Water Supply Facilities in Southeastern Wisconsin” has been added following the third paragraph on page 97. The draft text of the new section is included in the revised version of Chapter III transmitted with these minutes.]

Mr. Biebel then referred to Table 26 on pages 97 and 98 which indicated the initial startup and latest improvement dates for each of the water utilities. He noted that this table would be completed as data becomes available. Mr. Grisa pointed out that the initial start-up date of the utilities is reported in the Public Service Commission reports.

Ms. Conley referred to the fourth paragraph on page 100, in which it was stated that there has been a decrease in the use of surface water and an increase in the use of groundwater within the Region, and asked if that change was do to the urban development which has taken place west of the subcontinental divide. Mr. Biebel indicated that such development was a contributing factor, but that the shift was due, in large part, to the changes in industrial and other nonresidential uses in the areas east of the divide served by surface water. He cited the losses of large water users in the Milwaukee area, such as breweries and tanneries as examples of user-base changes. Ms. Lewis noted that the paragraph concerned indicated that the basis for the fact surface water use had remained constant over the period 1985 through 2000, while the resident population of the service areas was due to the reductions in water use by large industrial and nonresidential users. She indicated that while this was true, to a large extent, the phenomenon could also be reductions in per capita residential uses over that time. She suggested that the reason for the phenomenon not be stated without further supporting data. Mr. Biebel noted that the cause of the phenomenon could not be definitively identified without additional information on per capita residential uses. Chairman Bauer pointed out that the Wisconsin Public Service Commission data reports grouped multi-family uses, with the commercial use, thereby making the development of accurate per capita

residential use information difficult. After further discussion, it was agreed that the Commission staff would, to the extent possible, expand the data on historical water use to include per capita residential use, and then adjust the paragraph in question accordingly.

[Secretary's Note: Additional data has been added in the form of a new table identifying historic water used by user category. The text has been revised to reference that table as supporting information on the conclusions regarding the changes in water consumption patterns. The new table and revised text is included in the revised copy of Chapter III transmitted with these minutes.]

Mr. Grisa referred to Figure 14 on page 103 and indicated that the figure could be misleading, in that it may be interpreted to indicate a lower per capita residential water use in some of the counties, implying a more water-conservation conscience population, while the primary basis for the varying per capita use was the mix of land uses. Mr. Biebel agreed, noting that the available residential per capita water uses were very similar in all seven counties, while the variance shown in total water used on a per capita basis, in Figure 14 was due, in part, to the water uses associated with other than residential uses, such as industrial, commercial, and institutional uses. Upon further discussion, it was agreed to add further information on changes in residential uses on a per capita basis.

[Secretary's Note: An additional figure has been added to illustrate the changes in residential water use over time on a per capita basis. The text has been adjusted to reflect that additional data. The new figure and revised text are included in the revised version of Chapter III transmitted with these minutes.]

Dr. Cherkauer referred to the first sentence of the second paragraph on page 102 regarding the thickness of the aquifers underlying the Region. He recommended, and it was generally agreed, to delete the words "a thickness" in that sentence in order to more correctly define the vertical extend of the aquifers. Dr. Cherkauer also referred to Figure 12, a back reference to Chapter II, and suggested that the colors used by more distinctive between the semi-confining and confining units.

[Secretary's Note: A revised version of Figure 12 is included in the revised copy of Chapter III transmitted with these minutes.]

Dr. Cherkauer, referring to Figure 15 on page 106, recommended, and the Committee agreed, that a date be placed in the figure title and that the potentiometric surface term be clarified. Ms. Conley asked that the terms "potentiometric surface" and "equipotential line" be included in the Glossary of Terms set forth in Appendix C and the Committee agreed to the inclusion of these two definitions. Mr. Biebel noted, in this respect, that Dr. Cherkauer had provided a listing of recommended additions to the glossary which included the term "potentiometric surface."

Dr. Bradbury indicated he would provide supporting information for Figure 15, as the Wisconsin Geological and Natural History Survey was the source of the figure.

[Secretary's Note: A revised version of Figure 15 is included in the revised version of Chapter III transmitted with these minutes.]

Ms. Conley referred to the last sentence of the fourth full paragraph on page 107 and asked the reason for the referenced water chemistry changes in the confined aquifer. Dr. Bradbury indicated that as the groundwater flows from west to east in the confined aquifer, there are pockets of saline water are encountered which contain sodium and are blended into the moving groundwater. In addition, he said, sulfur bearing formations are encountered which added sulfur to the groundwater when contacted.

Dr. Cherkauer referred to the section on groundwater quality beginning on page 107. He noted that the groundwater quality, in many cases, varied between aquifers. He suggested, and the Committee agreed, that the explanation of the quality conditions be revised to note to the different aquifers involved.

[Secretary's Note: The section on groundwater quality beginning on page 107 (now page 119) has been revised and is included in the revised version of Chapter III transmitted with these minutes.]

Ms. Conley asked if there was evidence that the use of water softeners in areas served by onsite sewage disposal systems was potentially causing increases in chloride levels in the groundwater. Mr. Biebel responded that chloride levels were, indeed, increasing in surface waters due to the use of water softeners and road salting. He indicated that the staff would research the availability of data that would permit a response to Ms. Conley's question.

[Secretary's Note: A review was made of available groundwater quality reports and data. That review indicated no specific information on trends in chloride levels in groundwater over time. However, a paragraph on chlorides has been added following the first full paragraph on page 107 (now page 125).]

Mr. Czarkowski referred to the fourth paragraph on page 111 regarding bacterial testing. He recommended, and it was generally agreed, to revise the last sentence in that paragraph to read as follows: "However, this bacterial contamination may not always be due to aquifer conditions nor poor well construction, but may be due to factors of limited sanitary significance, such as the presence of insects under the well caps or by the presence of iron biofilm." Mr. Czarkowski also referred to the reference to the reported detection of coliform organisms in 25 percent of samples taken. He suggested that the reported percentage may be high, and indicated he would see if there were other studies which reported different percentages.

[Secretary's Note: Subsequent to the meeting Mr. Czarkowski recommended refined text be used to replace the last two sentences of the fourth full paragraph on page 111 (now page 124) as follows:

"Coliform bacteria have been detected in, on average, 15 percent of the private wells in the Region, although there is a wide geographic and seasonal variability. In shallow, fractured bedrock aquifers, such a dolomite in the Town of Lisbon, up to 73 percent of well have been tested "unsafe." Protected aquifer wells average less that 6 percent unsafe.[10] Overall, coliform detection rates are three times higher in late summer months than midwinter.[11] *E. coli*, the coliform most strongly associated with fecal contamination, is found in fewer than 2.6 percent of private wells.[12] Well bacterial contamination may not always be caused by poor aquifer conditions or substandard well construction. Incidental sources, such as insects under well caps, careless pumpwork, and iron biofilms are believed responsible for many coliform detects. For comparison, 3.7 percent of public water systems in the Region experienced confirmed total coliform contamination in 2005.[13]

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[10]*Sharon S*haver, Investigation of Bacteriological Water Quality in Private Water Supply Wells in Waukesha County, *WDNR Report 1996. Data from*

WDNR Groundwater Retrieval Network (GRN) and Waukesha County Environmental Health Department.

[11]*Jon Standridge, Wisconsin State Laboratory of Hygiene data; Sharon Shaver, Ozaukee County GRN Data, 1990-1995.*

[12]*Centers for Disease Control,* A Survey of the Quality of Water Drawn for domestic Well in Nine Midwestern States*, 1994.*

[13]*Charles A. Czarkowski, WDNR Drinking Water & Groundwater Expert, Public Water System database.*"]

Mr. Helmuth referred to Table 29 on pages 113 and 114 and Map 29 on page 115 which list and map areas of special well casing requirements. He indicated that revised data were available and would be provided to the Commission staff for incorporation into the report. Mr. Czarkowski noted that the WDNR was also studying other areas which may be added to the areas designated as special well casing areas. He indicated that information on those areas would also be provided to the staff as it becomes available to the report at that time.

[Secretary's Note: Based upon data provided by Mr. Helmuth, Table 29 and Map 29 have been revised and are included in the revised copy of Chapter III transmitted with these minutes.]

Mr. Schultz referred to the third paragraph on page 112 which presented information on the use of inland surface waters for water supply. He suggested that a statement be added regarding the unregulated riparian uses of surface waters.

[Secretary's Note: In response to Mr. Schultz's comment, the following sentences have been added following the reference to Table 30 in the 10th line of the third paragraph on page 112:

"In addition to the permitted uses of the inland surface waters, there are also ongoing unregulated uses of surface water by riparian landowners. These uses are varied, but primarily include lawn and garden watering and boat or vehicle washing."]

Ms. Conley referred to Table 31 on page 117 and asked if the residence time of 99 years was the same as the 1 percent renewal rate which has been reported in recent news articles. Mr. Biebel replied that the residence time is defined as the time required for the inflow to the lake to fill the full volume of the lake. Thus, in each year about 1 percent of the lake volume would be replaced if the residence time was, indeed, 99 years.

[Secretary's Note: The term "residence time" was added to the glossary of terms in Appendix C. In addition, the following sentences were added to the fourth paragraph on page 112 (now page 126):

"The residence time of Lake Michigan, or the time required for a volume equivalent to the full lake volume to enter the Lake, is estimated at 99 years. Thus, about 1 percent of the lake volume is replaced every year."]

Ms. Conley also asked about the impact of thermoelectric uses on Lake Michigan. Mr. Biebel noted that thermoelectric withdrawals of Lake Michigan surface were, indeed, significant. However, much of the water withdrawn is returned. It was agreed to add text on the thermoelectric uses of Lake Michigan water.

[Secretary's Note: In response to the request for information on thermoelectric uses of Lake Michigan, the following paragraph was added at the bottom of page 112 (now page 127):

"In 2000, a total of about 2,000 million gallons per day of surface water was withdrawn from Lake Michigan or it estuaries for thermoelectric power generation purposes within southeastern Wisconsin.[8] This is about six times the amount of water that was withdrawn for all other uses in the Region combined. Most water used for thermoelectric power generation is for "once-through" cooling or for cooling tower make-up water. Most of the water used is returned to the Lake.

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[8]*U.S. Geological Survey,* Water Use in Wisconsin, 2000, *Open File Report 02-356.*"]

Dr. Cherkauer asked if Chapter III was going to include inventory data on wastewater treatment plants. Mr. Biebel responded that there was information on the number and on the locations of wastewater treatment plants within the Region was included in Chapter II. However, given the focus of the study, no more-detailed data are planned, unless it is specifically needed on a case-by-case basis for alternative plan development or plan implementation purposes.

Ms. Conley noted that, historically, residents used cisterns, or other rainwater collection systems, for domestic water supply. Chairman Bauer agreed that rainwater was an historic source of supply accessed by the use of cisterns or other systems, but noted that definitive data on such supply was not generally available. Ms. Conley noted that the Urban Ecology Center in Milwaukee has been constructed with a cistern system.

Mr. Biebel referred to Map 30 and noted that the water supply system facilities described in the Chapter had not been specifically mapped, while salient features of those facilities were summarized in two tables. He indicted that was done in order to honor the commitment made in response to the Committee's previously expressed concerns relating to security issues.

Mr. Biebel noted that the Commission staff and consultant would, internally, be working with geographic information system-based mapping of the facilities. A depiction of the existing municipal water supply system facilities, however, would be important to communicate in a meaningful way the existing facility situation and—importantly—the alternative plans to be considered, to governmental officials and the public. Accordingly, it was planned to include in the chapter summary section a schematic illustration of the water supply system facilities, including water treatment plants, wells, storage and major transmission facilities. He indicated that the schematic illustration would cover the entire Region at a small-scale, page-size, so that the schematic would not be useful in identifying specific locations. The proposed schematic illustration would be provided to the Committee for review at a future meeting.

Mr. Marchese referred to Maps 30 and 32, and suggested, and the Committee agreed, that the subcontinental divide be added to the maps.

Mr. Helmuth referred to the section of the report on existing private community water supply systems on page 123. He and Mr. Czarkowski suggested changing the identification of such systems to be clearly distinguish them from public systems. Upon brief discussion, it was agreed to review to direct the staff to review the identification of the systems serving public and privately owned residential areas and to include a revised identification in the glossary of terms to be set forth in Appendix C.

[Secretary's Note: For clarity, it is proposed to refer to public—primarily municipal—water supply systems as "municipal water supply systems." Privately owned, community water systems which serve residential uses and which the Wisconsin Department of Natural Resources refers to as "other than municipal, community systems" will be referred to using that same term as used by the Department.]

Mr. Biebel then referred to Table 32 which listed selected characteristics of the public water supply systems in Kenosha County. Mr. St. Peter recommended that the number and capacity of the Pleasant Prairie storage facilities be verified.

[Secretary's Note: Data subsequently provided by the Village of Pleasant Prairie Water Utility indicated that the number of storage facilities should be revised to six, with a total capacity of 12.2 million gallons. Table 32 and the related text were revised accordingly.]

Mr. Biebel referred to Tables 34 through 39, which set forth selected information on self-supplied, private water systems for various land use categories. He indicated that those data were currently being prepared and summarized for the other six counties; and that the number of such facilities was so large as to require for presentation a total of 42 tables, some of which will be several pages long. Therefore, he recommended, and it was agreed, that Tables 34 through 39, and the similar information for the other six counties be included in an appendix. That appendix, he said, would have six tables, one for each self-supplied water use category, and would be organized by county. He indicated that the text would be changed to reference the tabular data included in a new Appendix E. Dr. Cherkauer suggested, and it was agreed, that the tabular data be subtotaled by county.

Ms. Conley referred to the section on water supply for thermoelectric power generation and questioned the 11.0 million gallons of water per day which is obtained from Lake Michigan at the Pleasant Prairie power plant. Mr. Biebel reported that the water was used primarily as make-up water in the plant cooling system of cooling towers; the make-up water being required to replace evaporation losses by the cooling towers. Mr. St. Peter noted that the water lost is primarily in the form of often-visible vapor and that the vapor is often wind blown toward Lake Michigan and would, in part, be redeposited in the Lake as precipitation.

There being no further questions or comments, on a motion by Mr. St. Peter, seconded by Mr. Melcher, and carried unanimously, the portion of Chapter III, "Existing Water Supply Conditions of the Region," of SEWRPC Planning Report No. 52, consisting of pages 97 through 138, was unanimously approved as amended.

[Secretary's Note: A copy of the revised text of Chapter III is transmitted with these minutes as in accordance with the Committee actions, with changes as proposed noted.]

Chairman Bauer then asked Mr. Biebel to review Appendix C, "Glossary of Terms and List of Abbreviations," with the Committee. Mr. Biebel indicated that the list of terms submitted was intended to be an initial compilation and was intended to be expanded as the conduct of the planning program, and, in

particular, the preparation of the state-of-the-art report, proceeds. In this respect, he indicated that Dr. Cherkauer had provided a list of additional terms and definitions which he recommended be added.

> [Secretary's Note: Subsequent to the meeting, Dr. Cherkauer, in consultation with Dr. Bradbury and Dr. Dunning, provided recommended additions and revisions to the glossary. A revised copy of Appendix C, "Glossary of Terms and List of Abbreviations," is transmitted with these minutes.]

Mr. Yttri recommended that a specific minimum size not be included in the definition of a water transmission main. Upon brief discussion, it was agreed to delete the reference to a specific size in the definition of the term "water transmission main" and to add the following sentences to the definition:

> "The definition of a water transmission main depends upon the function of the pipeline concerned within the system concerned. Thus, no minimum specific size pipe can be associated with this term."

In addition, the words "extend and" were added ahead of the word convey in the definition of the term "water transmission main."

Mr. Helmuth suggested, and it was agreed, to add definitions of the terms describing the types of water supply systems which were described in Chapter II be appropriately included in the glossary of terms.

There being no further questions or comments, on a motion by Mr. Yttri, seconded by Mr. Grisa, and carried unanimously, Appendix C, "Glossary of Terms and List of Abbreviations," of SEWRPC Planning Report No. 52, was unanimously approved as amended.

Chairman Bauer then asked Mr. Biebel to review Appendix D, "Lake Michigan Water Treatment Plant Raw Water and Finished Water Quality Characteristics," with the Committee. Mr. Biebel noted that the raw water characteristics noted in Table D-1 were secondary source data, taken from a 2002 report prepared for the Oak Creek Water Utility. The data in Table D-2 had been provided by the water utilities noted. A number of questions were raised regarding the data in Table D-1, particularly concerning the currency of the data, and the instances where the data were referenced as distribution system water, rather than raw water. Upon discussion, it was agreed that Table D-1 should be revised by replacing the data with new data to be obtained from the Kenosha, Milwaukee, and Racine water utilities. The representatives of those utilities present all indicated that up-to-date data on the Lake Michigan raw water quality were available.

Mr. Czarkowski asked that biological data, such as data on bacteria or protozoa levels found, be presented, if available. Mr. St. Peter responded that such data are likely for any raw water source variable and should be presented as a range, if available. It was agreed to attempt to obtain such data and present it in the form of ranges, if possible.

Mr. Yttri referred to Table D-2 and asked for a clarification on the differences between a dash, the abbreviation "ND," and a less than symbol. Mr. Biebel explained that the "ND" abbreviation meant "Not Detected" as reported by the utilities, and that a less than sign indicated that the utility concerned reported the specific value with the less than sign. He noted that the dash meant no data were reported. Mr. Mueller recommended, and it was agreed, that the table be footnoted to indicate the meaning of these three different symbols.

> [Secretary's Note: Data on the raw water quality are being revised. A revised copy of Appendix D, "Lake Michigan Water Treatment Plant Raw Water and

Finished Water Quality Characteristics," will be provided to the Committee for review when completed.]

There being no further questions or comments, on a motion by Mr. Mueller, seconded by Mr. Grzys, and carried unanimously, Appendix D, "Lake Michigan Water Treatment Plant Raw Water and Finished Water Quality Characteristics," of SEWRPC Planning Report No. 52, was unanimously approved as amended.

CONSIDERATION OF THE OUTLINE OF SEWRPC TECHNICAL REPORT NO. 43, *STATE-OF-THE-ART OF WATER SUPPLY PRACTICES*

Chairman Bauer asked the Committee to consider Agenda Item 4. He noted that all Committee members had received a copy of the outline of SEWRPC Technical Report No. 43, *State-of-the-Art of Water Supply Practices*, for review prior to the meeting. He noted that the firm of Ruekert & Mielke, Inc., was preparing the state-of-the-art report and that Mr. Steven H. Schultz was the project manager for the report preparation. He then asked Mr. Schultz to review the outline with the Committee. Before beginning the presentation, Mr. Schultz introduced Mr. Douglas J. Nelson who worked with Mr. Schultz on the report materials to be reviewed at the meeting.

Dr. Cherkauer questioned whether or not Chapters III and IV which covered surface water and groundwater treatment technologies should be combined, since there were technologies which are common to both surface and groundwater treatment. He cited the example of disinfection facilities. Mr. Schultz indicated that this format had been considered and that it was concluded that since there were significant differences between the applicable treatment technologies for surface water and groundwater to have the technologies should have separate chapters. Following discussion, it was agreed to provide a section in both Chapters III and IV cross-referencing the relationship of the chapters and technologies applicable to both surface water and groundwater.

[Secretary's Note: A copy of the revised draft table of contents with the changes agreed to noted is transmitted with these minutes.]

Mr. Bunker recommended, and it was agreed, that low-pressure filtration be added as a subheading under the first order heading "Filtration" under Chapter III. Mr. St. Peter supported the addition, indicating that such filtration would likely be the Lake Michigan water supply treatment system of choice in the future.

Mr. Marchese asked if the state-of-the-art report was to include only innovative technologies used in southeastern Wisconsin, or if it would it be broader in scope, including such technologies used elsewhere. Mr. Schultz replied that the technologies considered were those that were considered to have a reasonable potential for application in southeastern Wisconsin. However, the technologies considered were not limited to those presently used in southeastern Wisconsin. Mr. Nelson indicated that technologies used in a number of other states had, indeed, been considered.

Mr. Marchese suggested that certain technologies which were not indicated for presentation in detail, but which were considered initially for inclusion, but rejected, be noted and an indication of the reason for not including the technology in detail be provided. Mr. Schultz agreed and indicated, in some cases, that had been done. After further discussion, it was agreed to include text on technologies initially considered for inclusion, but screened out for detailed descriptions.

Mr. Marchese then asked if the report would include information on selected techniques in addition to technologies. He cited the example of the use of a cluster of wells, or a well field, as opposed to the technology of a well for groundwater withdrawals. Mr. Schultz responded that selected techniques had

been included in the report, but that well fields had not been included. After further discussion, it was agreed that a section would be added to the report on wells and well field.

> [Secretary's Note: Upon review, it is proposed to add a section to Chapter IV on wells and well fields. The title of the chapter is proposed to be revised to be "Groundwater Withdrawal and Treatment Technologies."]

Mr. Rau noted that there are techniques which can be used to optimize water supply systems on a regional or subregional basis. He cited the example of pumping schemes designed to minimize drawdown. Mr. Biebel indicated that it was not appropriate to include that type of management technology in the state-of-the-art report, but to include such technologies as part of the alternative and recommended plans.

Mr. Marchese asked if cost curves were to be developed for each of the technologies. Mr. Schultz indicated that cost curves would be involved for technologies where appropriated. In the case of some of the technologies, other types of cost data would be presented. He indicated that the curves would be included in an appendix.

Dr. Cherkauer raised the question of whether or not the word "groundwater" should be one or two words. Mr. Biebel indicated that all of the earlier work on the water supply plan had used "groundwater" as one word. He also reported that the earlier work, including the groundwater resources inventory report, utilized the one-word convention. Mr. Helmuth noted that the WDNR convention was to use groundwater as one word. It was agreed to continue to utilize the one-word convention for "groundwater."

Dr. Cherkauer referred to Chapter VI, "Groundwater Recharge and Management Alternatives," of the outline and referred to the section on "artificial recharge technologies." He recommended that the technology of "induced recharge" be specifically addressed. He noted that examples of that technology were in place in Denver, Colorado; Missoula, Montana; and Rapid City, South Dakota. Dr. Bradbury noted that induced recharge was also being practiced at a Madison golf course. It was agreed to include a specific section of Chapter VI on "induced recharge."

Mr. Bunker referred to Chapter VII, "Water Conservation," and recommended that the concept of water system maintenance and water loss minimization be specifically included. There was agreement on the inclusion. Chairman Bauer added that the other issues previously raised regarding water system pressure and sewer flushing volumes should also be raised.

Mr. Grisa referred to Chapter VII, "Water Conservation," and noted that the sections on "rate structures" and "use restrictions" should be second order, rather than third order headings. The correction has been duly made.

Ms. Lewis referred to Chapter VII, "Water Conservation," and noted that conservation initiatives will be a significant factor in the future of water supply management. She indicated that this would require changes in the Public Service Commission of Wisconsin policies and practices. Mr. Schultz indicated that that issue would be covered under the section on rate structures.

Ms. Lewis recommended, and it was agreed, to add a section to Chapter VII, "Water Conservation," which presents the conceptual considerations which have been discussed regarding water conservation at previous meetings.

> [Secretary's Note: It is proposed to add this section as a first order heading section following the introductory section in Chapter III. The topics to be included would, among others, include: the definition of conservation and its relevance when water

withdrawn from Lake Michigan or when it is withdrawn from the groundwater aquifers and is then returned to the source; the issue of industrial uses cost implications, particularly where long-term infrastructure capacity is in place; the importance of water supply infrastructure maintenance budgets to minimize water losses; and other potential problems to be considered in implementing certain water conservation practices.]

Mr. Grisa pointed out that consideration should also be given to the potential for conservation efforts to have positive impacts on conveyance and treatment facilities. Mr. Marchese disagreed, stating that those impacts would be minor because the problems in most wastewater systems are related to excessive peak flow conditions which are related to excessive clear water infiltration and inflow.

Ms. Conley noted that reduced infrastructure costs were often the most significant potential savings resulting from conservation measures. Mr. Biebel indicated that would be true in some systems, but was not the case in the major Lake Michigan water supply systems where long-term capacities were in placed based upon current and expected future uses, and where the systems may be operating well below the design capacities. Conservation in such systems typically results in very modest decreases in operating costs attended by major decreases in revenues.

Mr. Duchniak stated that the infrastructure costs were often largely driven by expected fire protection flow requirements, as opposed to other system sizing considerations. Thus, the potential impact of conservation on infrastructure costs would not be as significant as it may appear.

There being no further questions or comments, on a motion by Mr. Melcher , seconded by Ms. Lewis, and carried unanimously, the outline of SEWRPC Planning Report No. 43, was unanimously approved as amended.

[Secretary's Note: A copy of the report outline, revised in accordance with the Committee actions, with the changes as proposed noted, is transmitted with these minutes.]

CONSIDERATION OF CHAPTER I, "INTRODUCTION," OF SEWRPC TECHNICAL REPORT NO. 43

Chairman Bauer asked the Committee to consider Agenda Item 5. He noted that all Committee members had received a copy of Chapter I of SEWRPC Technical Report No. 43 for review prior to the meeting. He then asked Mr. Schultz to review the Chapter with the Committee.

Mr. Rau referred to the list of items under the heading "Scope" on page 1 and asked where considerations, such as potential management agencies, would be described. Mr. Biebel responded that a section on potential management agencies would be included in the plan implementation chapter of the planning report—SEWRPC Planning Report No. 52, *A Regional Water Supply Plan for Southeastern Wisconsin*. That chapter would also include a review of the agencies and recommendations and designations of such agencies to carry out the plan.

There being no further questions or comments, on a motion by Ms. Lewis, seconded by Mr. Melcher, and carried unanimously, Chapter I of SEWRPC Planning Report No. 43, was approved unanimously as presented.

[Secretary's Note: During the review of the initial portions of Chapter III, it was recommended that additional text be provided describing the cost estimation procedures

used. Since the basic description of the cost estimation procedures relates to several report chapters, it is proposed to add a section to the end of Chapter I, "Introduction," covering that topic. The subsequent chapters on technologies then would include a section on sources of cost data as it applies to the technologies in each of those chapters. The following paragraph is proposed to be added to the end of Chapter I:

"**COST ESTIMATION PROCEDURES**

The sources of cost data are cited in each of the subsequent chapters on technologies. In most cases, these sources are national publication documents supplemented by local project data, where available. Costs estimated throughout this report have been adjusted to an ENR value of 9563, which is the December 2005 average of the Chicago and Minneapolis indices. The level of precision in all estimates is expected to fall between the range of Class 5 and Class 4 estimates, as defined by the Association of the Advancement of Cost Engineering (AACE) International. The accuracy of the cost estimates would typically be expected to be minus 30 percent to plus 50 percent when relying on the use of national publication sources of cost data. However, given that there has been actual local project data available to check the more generalized cost data sources, the accuracy will likely be higher than typically expected. In addition, the cost estimates developed for alternative and recommended regional plans, will be developed for multiple plan components which will be aggregated. As the costs for the various components are aggregated, the accuracy of the estimates for the plan as a whole, are expected to be improved due to the offsetting impact of potentially high and low component costs."]

CONSIDERATION OF CHAPTER III, "SURFACE WATER TREATMENT TECHNOLOGIES," OF SEWRPC TECHNICAL REPORT NO. 43

Chairman Bauer asked the Committee to consider Agenda Item 6. He noted that all Committee members had received a copy of Chapter III of SEWRPC Technical Report No. 43 for review prior to the meeting. He then asked Mr. Schultz to review the Chapter with the Committee.

Mr. Marchese asked about the procedures used to obtain updated costs. Mr. Nelson indicated that the costs generally came from the two sources cited in the third paragraph on page 1, but were updated by using the *Engineering News Record* index. Mr. Marchese asked if those costs were then compared to local costs, where available. Mr. Nelson indicated in the affirmative and indicated that, generally, good agreement was found between the updated costs from the sources noted and the local costs where they were available. After further discussion on local project costs, it was agreed that the consultant would check and report on costs from local projects for microfiltration facilities for Racine and Kenosha and for ozonation costs at Milwaukee.

Mr. Marchese referred to the third paragraph on page 1, and asked which *Engineering News Record* index was being used. Mr. Biebel responded, indicating that a "Milwaukee Index" was being used for all the regional water supply planning work. That index is not a published value, but, rather, is the arithmetic average of the Chicago and Minneapolis published values.

Mr. Bunker cautioned that the cost data should be carefully reviewed to determine the inclusion of ancillary costs. He noted, for example, that when the recently completed Racine microfiltration facility

was built, there was also a carbon storage and feed system installed, the cost of which was over and above that typically expected for microfiltration. Mr. Schultz acknowledged that concern. However, he also noted that the costs being developed were for use system-level planning. Such costs are generally considered to be less precise than would be used for site-specific facility planning and engineering.

Mr. Marchese asked what the expected precision might be. He offered plus or minus 30 to plus 50 percent as a possibility. Mr. Schultz agreed with that range. Chairman Bauer indicated that the range suggested was, in his opinion, excessive, and recommended that a discussion be added to the report dealing with this issue.

[Secretary's Note: To address this issue, the paragraph noted above entitled "Cost Estimation Procedures" was added to Chapter I.]

Mr. St. Peter referred to the section entitled "Intake Protection and Treatment" on page 2. He asked if the costs for of the intakes were to be included in the report. After further discussion, it was agreed that a section should be added dealing with water treatment plant intake descriptions and costs.

[Secretary's Note: A section on water treatment plant intakes was added at the top of page 2, is included in a revised copy of Chapter III transmitted prior to the next Committee meeting.]

Ms. Conley raised the issue of blue-green algae which were a problem in some surface waters. After discussion, it was agreed that that was not an issue with the Lake Michigan water plants.

Ms. Lewis referred to the first paragraph on page 2 and suggested, and it was agreed, to note in the text that intake screens are often located at the shoreline, and not at the intake inlet.

Ms. Lewis referred to the first paragraph on page 2 and suggested, and it was agreed, to add text on needed protection from the more-recently arrived quagga mussel, as well as from the zebra mussel. She noted that protection from this mussel may require year-round chemical control.

[Secretary's Note: The draft text of the second paragraph on page 2, has been revised and is shown in the revised copy of Chapter III transmitted prior to the next Committee meeting.]

Mr. Helmuth referred to the second paragraph on page 2 and noted that chlorine was another oxidizer used as a biocide. It was agreed to add chlorine to the text concerned.

Mr. Czarkowski recommended that the abbreviations used in the report for measurements of flow, such as gallons per day (gpd) and million gallons per day (mgd), be checked for consistency with the listing in Appendix C. Because of the potential duplication with milligram (mg), it was agreed to use MG as the abbreviation for million gallons.

Mr. Helmuth referred to the fourth paragraph on page 3 and suggested that the description of in-line flash mixing be revised to clarify that the use of those facilities is typically associated with flocculation and settling chambers.

[Secretary's Note: The text of the fourth paragraph on page 3 has been revised to clarify the typical use of flash mixers. The revised text is included in the revised copy of Chapter III transmitted prior to the next Committee meeting.]

Chairman Bauer then indicated that, due to time constraints, the review of the remainder of Chapter III following page 5 and beginning with the section entitled "Filtration" would have to be postponed to the next meeting.

[Secretary's Note: A revised copy of Chapter III is being provided for the next meeting, indicating the changes made in response to the meeting comments.]

OTHER BUSINESS

Chairman Bauer then indicated that Mr. Marchese had requested the opportunity to brief the Committee on a report prepared by the Public Policy Forum on water resources. Mr. Marchese noted that the Forum had recently completed an 18-month-long study on water resources and prepared a report documenting the findings and recommendations of that study entitled *Clear Water, Health Future, Framework for Achieving an Integrated Water Resources Strategy for the Milwaukee Region.* Mr. Marchese noted that the report was comprised of three main sections, covering findings, recommendations, and subsequent steps to be taken. He offered to provide a 15- to 20-minute presentation made on the study at the next meeting. Following further discussion and a show of hands to determine interest in hearing such a presentation, it was agreed to ask Mr. Marchese to make the presentation at the next meeting.

Mr. Biebel then noted that at the previous meeting, Mr. Holschbach had indicated that he had heard a presentation by a representative of the Wisconsin Department of Commerce (WDC) regarding water reuse options which that WDC was considering, and Mr. Holschbach had suggested that consideration be given to adding a representative of the WDC to the Committee. Mr. Biebel indicated that, accordingly, the Commission staff had contacted both Mr. James E. Zickert, the WDC staff member who made the presentation Mr. Holschbach heard, and Mr. Thomas L. Braun, a WDC expert on water reuse. It was concluded that Mr. Braun was the key staff person at WDC relating to water reuse options. Mr. Braun is stationed at Stevens Point, Wisconsin, and would not be able to be a participating Committee member. Mr. Braun did, however, indicate that he would be willing to make a presentation on the subject of water reuse options from the WDC perspective to the Committee at a mutually convenient date. Following some brief further discussion, it was agreed to ask Mr. Braun to make a presentation to the Committee at a future mutually convenient meeting date to be determined.

DATE AND TIME OF NEXT MEETING

After a brief discussion, the next meeting of the Advisory Committee was tentatively scheduled to be held in the Commission offices on May 17, 2006, beginning at 9:00 a.m.

ADJOURNMENT

There being no further business to come before the Committee, on a motion by Mr. Cotter, seconded by Duchniak, and carried unanimously, the meeting was adjourned at 12:30 p.m.

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