APPENDICES

A. 208 PLAN COMMITTEES

BOARD OF DIRECTORS

The East-West Gateway Coordinating Council is governed by a Board of Directors whose function is to set policy, approve or reject plans, and make all final decisions on plans and policies affecting the Council as well as the region.

The Board of Directors is comprised of 21 members, ten from the State of Illinois and ten from the State of Missouri, plus the Chairman of the Bi-State Development Agency. Two members from each state serve as ex-official members without voting privileges. Along with the elected officials who sit on the Gateway Board, six regional citizens also review and vote on proposed projects.

Plans formulated by East-West Gateway's professional planning staff are reviewed by the Council's Board of Directors before they are recommended for implementation.

Gene McNary, Chairman
Supervisor, St. Louis County

Victor P. Canty, Chairman
St. Clair County Board

Walter Steinburk, Treasurer
Presiding Judge, Jefferson County

Nelson Hagnauer
Chairman, Madison County Board

Hugh McCane
Presiding Judge, Franklin County

James F. Conway
Mayor, City of St. Louis

William Mason
Mayor, City of East St. Louis

William A. Magurany
Mayor, City of Wood River

Mrs. Wilda Worley
Citizen

John Fedrick
Citizen

Leo Konzen
Citizen

Robert Crawley
Citizen

Fred Teer
Citizen

Ms. Lois Bliss
Citizen

Charles Schwendemann
Presiding Judge, St. Charles County

Donald R. Melhorn
Village President of Swansea

Robert A. Heimsch
Mayor, City of Des Peres

Paul J. Simon
President, Board of Alderman,
City of St. Louis

Chester Schmidt, Chairman
Board of Commissioners
Monroe County

John Bellcoff
President of Southwestern Illinois
Metropolitan and Regional Planning
Commission

John Brawley
Bi-State Development Agency

NONVOTING MEMBERS

Stephen C. Bradford
Commissioner
State of Missouri

Dan C. Dees, Chief
Bureau of Planning
Illinois Department of
Transportation

Robert Hunter
Missouri State Highway
Commission

John W. Castle
Department of Local
Government Affairs,
Illinois

Jack Kirkland
Missouri Department of
Transportation

WATER QUALITY POLICY ADVISORY COMMITTEE

This Committee had the responsibility for formulating policy relating to the 208 Plan and for making a recommendation to Gateway's Board of Directors on whether they should approve the Plan. The Committee accomplished these tasks by helping Gateway's Water Quality staff and consultants identify water quality problems in the region and develop solutions to these problems.

The Committee had thirty-six members, including elected officials, operators of wastewater treatment facilities, representatives from industries, and members of the Water Quality Citizens Task Force. In addition, state and federal agency representatives served in an ex-officio capacity to ensure consistent policy orientation between the Plan and other federal and state programs.

MEMBERS

James Beckman
Representing Agriculture

Albert Beyer
Representing Jefferson County
Water Quality Citizen Task Force

Ulrich W. Busch
Representing Franklin County
Planning Department

*Robert Chandler
Representing National Park Service

Elmer Cowan
Representing Franklin County
Municipal League

*Lee Duvall
Representing U.S. Environmental
Protection Agency

Roberta Fishman
Representing City of St. Louis
Water Quality Citizen Task Force

Tim Hennessy
Representing the Plumbing Industry

Earl Holtgraewe
Representing Missouri Department
of Natural Resources

R. R. Imsande
Representing Metropolitan Sewer
District

Frank Janson
Representing Metropolitan Sewer
District

*Cloyd Johnston
Representing Federal Land Bank
of St. Louis

*Indicates Non-Voting Members

Larry Keith
Representing Water Quality
Citizen Task Force

*Edwin Knight
Division of Environmental
Quality
Representing Department
of Natural Resources

James Love
Representing Kimmswick

Judge Hugh McCane
Chairman
Representing Franklin
County

*Robert S. Miller
Representing State of
Missouri

Robert S. Nelson
Representing Associated
Industries of Missouri

*Carl Noren
Representing Missouri
Department of Conservation

Suzanne Pogell
Representing Water Quality
Citizens Task Force
League of Women Voters

Dave Rahubka
Representing U.S. Corps
of Engineers

Boston Richards
Representing Crystal City

Sandy Rothschild
Representing Home Builders
Association

Judge Charles Schwendemann
Representing St. Charles County

*Don Spencer
Representing U.S. Department of the Interior

Judge Walter Steinburk
Representing Jefferson County

*Rick Sterling
Representing Missouri Office of Administration

Michael E. Swoboda
Representing St. Louis County Municipal League

Virginia Van den Broek
Representing St. Charles Water Quality Citizen Task Force

Michael Whitaker
Representing Lake Saint Louis

*Betty Wilson
Representing Missouri Clean Water Commission

Luis Zambrana
Representing St. Louis County

Walter Zollmann
Representing City of St. Louis Water Division

Walter Johanpeter
Representing City of St. Louis Water Division

Joe Frank
Representing St. Louis Community Development Agency

Steve Donatiello
Representing City of St. Louis Water Quality Task Force

*Indicates Non-Voting Member

208 WATER QUALITY CITIZEN TASK FORCE

The Task Force was responsible for representing citizens' interest during the 208 Water Quality planning process. The Task Force made reviews on various solutions, approaches and plans developed by Gateway's 208 Water Quality staff and consultants. The Task Force had 42 members, including representatives from each county, real estate brokers, farmers, lawyers, chemists and environmentalists. Unaffiliated citizens, as well as citizens representing organizations, served on the Task Force in a voluntary capacity for the duration of the program.

MEMBERS

Stephen C. Banton

Ted Stude

Jean Barton

Albert Beyer

Cecelia Beyer

Gerry Bratsch

Steve Donatiello

Vince R. Ellwood

George R. Englebach

Roberta Fishman

Jo Gallo

Dorothy Heinze

Gloria Hinch

Marjorie Huenneke

Claude E. Jones, Jr.

Larry W. Keith

Hildegarde Kramer

Susan Lammert

Ernestine Magner

Tony Nenninger

Donald W. Pettigrew

Gilbert G. Pfaff

Suzanne Pogell

Ted Pruess

Virginia Van den Broek

Albert Weiss

Betty Wilson

John H. Wright

Jane McKenna

Mary Reilly

EX-OFFICIO MEMBERS

Mr. Lee Duvall
208 Project Officer
U.S. Environmental Protection Agency

Mr. Earl Holtgraewe
Regional Engineer
Department of Natural Resources

Mr. Edwin Knight
Division of Environmental
Quality
Department of Natural Resources

Mr. Jerome Pratter
Team Four Inc.

Mr. Alan C. Richter
Executive Director
East-West Gateway Coordinating
Council

Mr. Einar M. Syvertsen
CH2M-Hill, Inc.

B. MONITORING SYSTEM

I. INTRODUCTION

Water quality monitoring in St. Louis will be used for several different functions, including enforcement and the establishment of water quality standards as well as continous planning. Each of these functions has its own unique requirements and much of the information generated for one monitoring function may not be entirely interchangeable among the other functions.

Water quality monitoring for the enforcement of regulations and discharge permits requires very careful documentation of cause and effect in a manner acceptable to the courts and enforcement agencies. Presently, enforcement is being jointly carried out by EPA on the federal level and on the state level by the Division of Environmental Quality (DEQ), Missouri Department of Natural Resources. The present enforcement roles of EPA and DEQ are proposed to be unchanged.

Water quality monitoring for the establishment of water quality standards is directed at defining the needs of various water uses such as domestic water supply and fish propagation. Monitoring for the establishment of standards often involves basic research into the effect of pollutant discharges on various water uses with sophisticated analytical techniques not in common practice. Presently, most monitoring for the establishment of standards is being conducted by various research organizations such as universities and federal agencies. State agencies such as the DEQ are also involved with monitoring in order to document unique problems. The present role of federal agencies, state agencies and universities in the development of water quality standards will continue unchanged.

Water quality monitoring as a component of the continuous planning process requires a broad data base taken over a long period of time for a specific area that can be used by various planning agencies, such as East-West Gateway, local municipalities and the State of Missouri. The primary focus of

this work is in developing future wastewater control strategies. Data for planning also must be carefully obtained by using acceptable sampling and analytical techniques but its primary objective is to document long-term trends. Thus, data used for planning purposes often is not acceptable for water quality standards enforcement or the establishment of water quality standards. However, the reverse is not necessarily true. Data used for enforcement and establishment of standards may be useful for continous planning. The water quality monitoring presented in the report is designed to satisfy the region's continous planning needs.

II. REPOSITORY FOR WATER QUALITY DATA

Regardless of the monitoring goal, one of the most important functions of the entire water quality monitoring program is to produce a set of usable data which is easily accessible for all the monitoring purposes. Data supplied from the various elements of a water quality monitoring program must be continuously analyzed and catalogued in an orderly manner to allow easy access by the various planners, agencies and the public. Often a significant delay is experienced between the collection of water quality data and its publication. Some federal agencies require between one and two years for publication of field data. This program should view delays beyond two and three months as unacceptable and work to eliminate such impediments to future water quality planning.

III. EXISTING WATER QUALITY MONITORING PROGRAM

Within the study area, a large number of organizations are presently obtaining water quality data. There appears to be no coordination of the data acquisition efforts of these various organizations. This is true nationwide. As a result, the water quality data presently available to local planners and the public may be repetitious in some cases and inadequate in others. The following list of organizations is provided as a partial accounting of the sources of water quality data that have been identified during the course of the St. Louis 208 study. Other organizations probably collect water quality data and could be identified as contributing to this overall effort. The extent of water quality monitoring carried on by these organizations may vary depending upon budget sources available to them. Organizations now identified as major contributors to the area's water quality data include:

1. U.S. Environmental Protection Agency.

2. U.S. Geological Survey

3. U.S. Army Corps of Engineers

4. Metropolitan Sewer District of St. Louis

5. State of Missouri

   a. Department of Natural Resources
   b. Department of Conservation
   c. Geological Survey and Water Resources

6. State and Private Universities include:

   a. University of Missouri at St. Louis
   b. University of Missouri at Rolla
   c. Washington University
   d. Southern Illinois University at Edwardsville

7. Private Analytical Laboratories and Services

8. Private and Public Treatment Systems include:

   a. Water Treatment and Sewer Treatment

9. Illinois Environmental Protection Agency and Water Survey

IV. OBJECTIVES

Because of the high costs of monitoring, it is necessary to establish priorities for the St. Louis Water Quality Monitoring Program. Certain data requirements of the planning and enforcement process are more urgent and/or required by law. Therefore, the major functions for water quality data collection which are presented below have been ranked according to their importance and fundability.

The priorities established below further the distinction between monitoring for enforcement and monitoring for planning.

Functional Group A is considered the most important monitoring. It is essential to the water quality plnning process that the elements of Function A, which include 1) point source effluent monitoring, 2) major stream water effluent monitoring, and 3) biota sampling of major streams, be implemented for the purpose of defining water quality problems and changes.

The other functions detailed below are less critical to the water quality planning process. Nevertheless, they are important to presenting a complete picture of water quality conditions and so should not be eliminated from the monitoring program. Funding, however, for some of these elements may prove difficult.

Function Group B involves urban stream water quality monitoring for the purpose of updating and modifying water quality models.

Function Group C involves 1) detailed urban runoff water quality monitoring, 2) individual home treatment systems monitoring, and 3) water quality monitoring of streams with significant discharges from individual home treatment systems, for the purpose of evaluating the effectiveness of certain nonpoint source controls.

It is important to restate that the proposed monitoring program is not designed to be used strictly for enforcement purposes. Although water quality problems may be documented or defined by this monitoring program, the data produced should not be solely used for enforcement actions. In addition, the restrictions required for monitoring of enforcement quality will significantly increase the monitoring program cost and will certainly limit the planning agencies' ability to obtain the data needed for planning and evaluation purposes.

A. Funding

Funding the monitoring program will present some special problems.

Among the "A" group of monitoring elements point source effluent monitoring will not be a new cost item. This work will be conducted by EPA and DNR and is to be funded through their existing permit programs. In contrast, the monitoring of major streams will occasion an increase in public expenditures. It is most likely that either the state or the regional planning and management agency, EWGCC, will be expected to assume the operating and capital costs of this

monitoring element. Unfortunately, local funding will be difficult to secure which will negate not only local responsibility for this element but probably EWGCC's too. Thus, state action is the preferred route. Biota sampling is the third "A" group element. It is extremely expensive, therefore, this monitoring facet is limited in scope. Nevertheless, a yearly operating cost of $60,000 must be absorbed. This expense, as in the previous case, will be considered a regional cost and this faces an uphill battle for state appropriations.

Group "B" monitoring covers only one element--urban stream water quality which is related to stormwater. The sampling points for this element are located solely within St. Louis County. Regardless of the fact that one county is the initial focus of this activity, the funding again should be from a larger base.

The rationale for this cost allocation formula is the interrelationships among the region's streams. Simply put, county and municipal lines do not insulate areas from adjacent pollution sources. Thus, this monitoring function should be "regionalized" and the cost made part of either the EWGCC or state program.

The Group "C" elements of the water quality monitoring program are not essential to the overall monitoring effort. However, if funding can be developed for these elements, the data base for regional plan evaluation especially of techniques for continuing IHTS and urban runoff would be vastly improved. However, at this time, there is no assured source of funding for this group of activities. The cost of the detailed urban runoff monitoring ($40,000/year capital and $492,000/year operating cost) is particularly high. It appears that absent special funding such as an EPA demonstration grant, these regional aspects of monitoring cannot be funded by Gateway alone.

V. WATER QUALITY MONITORING PROGRAM ELEMENTS

The water quality monitoring program for the St. Louis 208 study area will consist of eight major elements each designed to accomplish a specific objective. The objective of each element along with the type of monitoring, location of sampling points, and a cost estimate is presented below. A list along with a summary of monitoring cost is presented in Table B-1.

It should be noted that the sampling required by one element must be coordinated with the monitoring and sampling of the other elements in order to acheive the greatest overall efficiency. Other information such as land use changes, topography changes, and climatological data must also be collected in order to provide the planner with sufficient data to analyze the effectiveness of the 208 Plan and modify its implementation.

The sampling locations presented in Figure 30 (p. 193) and the following discussion are to be used only as a general guide for the location of the actual sampling site. The precise location of the monitoring sites will require a detailed field reconnaissance. Some of the suggested monitoring sites correspond to existing or past sampling sites. It is possible and indeed preferable to coordinate the suggested sites with existing sampling sites.

A. Point Source Effluent Monitoring

1. Objective. The primary objective of point source effluent monitoring is to document a historical record of pollution loads discharged to the area's waters by municipal and industrial point sources. The point source effluent data will be used to update the instream water quality model and to correlate instream water quality changes with discharges from point sources.

2. Type of Monitoring. Point source effluent monitoring will be supplied through the existing NPDES Discharge Permit compliance monitoring currently administered by Missouri DEQ and Federal EPA. Sampling methods and frequencies along with the required analytical procedures will continue to be specified by the NPDES Discharge Permit. Consideration should be given to expanding the list of commonly monitored constituents to include nitrogen, both in the form of total and ammonia, along with phosphates. Consideration should also be given to increasing the sampling frequency to provide a minimum of monthly effluent samples.

3. Priority Level: A.

4. Locations. Currently EPA and DEQ require all point sources with discharges to the area's water to obtain an NPDES discharge permit. Specific locations of effluent sampling is also specified in the NPDES discharge permit.

5. Cost. No additional cost is anticipated since the current cost of effluent monitoring is borne by each individual discharger.

6. Monitoring Agencies. The monitoring agencies are EPA and DNR.

TABLE B-1
WATER QUALITY MONITORING COST SUMMARY

ELEMENT	PRIORITY	FRANKLIN COUNTY	JEFFERSON COUNTY	ST. CHARLES COUNTY	ST. LOUIS COUNTY	TOTAL
CAPITAL COST						
Point Source Effluent Monitoring	A	--	--	--	--	--
Major Stream Water Quality Monitoring	A	12,000	22,000	12,000	10,000	56,000
Biota Sampling of Major Streams	A	--	--	--	--	--
Urban Stream Water Quality Monitoring	B	--	--	--	6,000	6,000
Detailed Urban Runoff Water Quality Monitoring	C	--	4,000	--	36,000	40,000
Individual Home Treatment Systems Effluent Monitoring	C	5,000	5,000	7,500	7,500	25,000
Water Quality Monitoring of Streams with Significant Discharges from IHTS	C	8,000	10,000	8,000	26,000	26,000
Groundwater Sampling	C	--	--	--	--	--
TOTAL CAPITAL COST		25,000	41,000	27,500	59,500	153,000
ANNUAL OPERATING COST						
Point Source Effluent Monitoring	A	--	--	--	--	--
Major Stream Water Quality Monitoring	A	19,000	59,700	18,700	23,500	120,900
Biota Sampling of Major Streams	A	--	15,000	30,000	15,000	60,000
Urban Stream Water Quality Monitoring	B	--	--	--	10,300	10,300
Detailed Urban Runoff Water Quality Monitoring	C	--	49,000	--	443,000	492,000
Individual Home Treatment Systems Effluent Monitoring	C	1,700	1,700	2,550	2,550	8,500
Water Quality Monitoring of Streams with Significant Discharges from IHTS	C	6,300	8,700	6,300	--	21,300
Groundwater Sampling	C	400	400	400	400	1,600
TOTAL ANNUAL OPERATING COST		27,400	134,500	57,950	494,750	714,600

B. Major Stream Water Quality Monitoring

1. Objective. Instream water quality data will be collected to: 1) determine the aggregate impact on water quality of all of the various discharges including point and nonpoint sources; 2) detect long-term water quality trends; 3) provide a long-term data base for future water quality modeling and planning; and 4) measure the water quality improvements associated with plan implementation.

2. Type of Monitoring. Monthly grab samples will be analyzed for bacteria, nutrients such as ammonia and phosphate, oil and grease, phenols, TDS, heavy metals, organics, and suspended solids. All sampling must include an estimate of flows to allow measurement of total pollutant loads. Sampling should be accomplished on a minimum of once monthly but periodic intensive sampling associated with individual storm events will also be necessary.

One sampling station located on the Lower Meramec will be sampled at least once per week in order to define more precisely relatively short-term instream water quality changes due to storm events in other transitory phenomena.

3. Priority Level: A.

4. Location. Table B-2 presents a list of all the major stream water quality monitoring stations along with a short definition of the reason for monitoring.

5. Cost. The costs of constructing and operating the Major Stream Water Quality Monitoring Stations will be borne jointly by the State and Gateway, assuming that continuing 208 funding may be used for this purpose. The costs of this program are summarized below.

County	Number of Sites	Capital Cost	Total Annual Cost
Franklin	6	$12,000	$ 19,000
Jefferson	11	22,000	59,700
St. Charles	6	12,000	18,700
St. Louis	5	10,000	23,500
TOTAL	28	$56,000	$120,900

6. Monitoring Agency. The monitoring agencies for this program would be Gateway and DNR.

TABLE B-2
MAJOR STREAM WATER
QUALITY MONITORING SITES

Name/Location	Site Location Number	Type
FRANKLIN COUNTY		
Upper Bourbeuse @ Hwy. H	1	Instream: Boundary Inflow
Bourbeuse @ I-44	2	Instream: Impact of Development and Growth
*Upper Meramec Near Sullivan (Hwy. 185)	3	Instream: Boundary Inflow
Meramec Above Bourbeuse Near Hwy. AM (no bridge)	4	Instream: Quality above impact of Bourbeuse
Meramec Near Robertsville @ Hwy. N	5	Instream: Impact of Bourbeuse, before Pacific
St. John's Creek @ Hwy. 100	6	Instream: Rural Nonpoint and IHTS
JEFFERSON COUNTY		
*Meramec @ Eureka @ Hwy. W	11	Instream: Impact of Pacific
Big River near DeSoto @ Mammoth Bridge	12	Instream: Boundary Inflow
Belew Creek @ mouth near Hwy. BB	14	Instream: Point source impact (208 alternative has discharge to creek)
Joachim Creek @ Victoria	15	Instream: Point Source
Plattin Creek	16	Instream: Point Source
Joachim Creek near mouth @ Hwy. 61-67	17	Instream: Urban Impact & growth
Rock Creek @ Hwy. K	18	Instream: Impact of growth, removal of point sources
Saline Creek @ Hwy. 141	19	Instream: Impact of growth, removal of IHTS
Meramec River at Paulina Hills	21	Instream, Biota (weekly sampling for instream)

TABLE B-2
(Continued)

Name/Location	Site Location Number	Type
JEFFERSON CO. (Cont.)		
Duckett Creek near mile 1.0	27	Instream: Urban development
ST. CHARLES COUNTY		
Dardenne Creek @ Hwy. 40-61	28	Instream: Upstream of developed area
Dardenne Creek @ I-70	29	Instream: Impact of development
Peruque Creek above Lake St. Louis @ Hwy. 40-61	30	Instream: Upstream of developed area
Peruque Creek below Lake St. Louis @ I-70	31	Instream: Impact of development
Peruque Creek @ Hwy. P	32	Instream: Removal of Point Source Biota: Impact of development
Cuivre River @ Hwy. 79	34	Instream: Rural non-point impact
ST. LOUIS COUNTY		
Wildhorse Creek @ Wildhorse Creek Rd.	40	Instream: Rural Non-point
Bonhomme Creek @ Hwy. 40	41	Instream: Development
Creve Coeur Creek @ Olive Street Road	42	Instream: Urban and Rural Impact on Lake
Creve Coeur Creek @ I-70	43	Instream: Impact of development
*Mississippi River @ Eads Bridge	44	Instream: Long-Term Quality Change

*These monitoring sites are existing NASQUAN stations which should be continued.

C. Urban Stream Water Quality Monitoring

1. Objective. Urban stream water quality monitoring will: 1) document instream impacts of stormwater runoff for streams which are located in urbanized areas; and 2) establish long-term water quality trends associated with stormwater runoff from different levels of development and land uses.

2. Type of Monitoring. Grab samples will be taken on a minimum frequency of once per month and analyzed for bacteria; nutrients, such as ammonia and phosphate; oil and brease; phenols; total dissolved solids; selected heavy metals; BOD; and suspended solids. All sampling must include estimates of flow to allow an estimate total pllution load. Periodically more frequent sampling associated with a particular storm event or problem may be required.

3. Priority: B.

4. Location. The location of Urban Streams Water Quality Monitoring sites are in St. Louis County and are outlined in Table B-2. As developed patterns change, location of these monitoring sites is also expected to change.

TABLE B-3
URBAN STREAM
WATER QUALITY MONITORING SITES

Name/Location	Site Location Number	Type
ST. LOUIS COUNTY		
Coldwater Creek @ Old Halls Ferry Road	48	Urban: Urban Instream Impact
Coldwater Creek @ Hwy. 67	49	Urban: Urban instream impact, point source
Maline Creek @ Goodfellow Road	50	Urban: Urban instream impact

5. Cost. The cost of Urban Stream Water Quality Monitoring is summarized below. It should be noted that increased sampling frequency will increase the total annual cost. MSD and Gateway should share the costs of this program.

ST. LOUIS COUNTY: $ 6,000--Capital Cost
10,300--Total Annual Cost

6. Monitoring Agency. MSD would be the monitoring agency for this program.

D. Detailed Urban Runoff Water Quality Monitoring

1. Objective. Detailed urban runoff water quality monitoring will develop detailed site specific, reliable data of urban runoff and define the temporal relationship between precipitation and runoff quantity and quality. Data from the detailed urban runoff water quality monitoring will be used to provide the planners with a more precise estimate of the pollution from urbanized areas. This data will be used to confirm the pollution runoff parameters used in the existing water quality model taken primarily from literature and to provide for further calibration of the water quality models by utilizing local data.

2. Type of Monitoring. Automatic sampling stations will be established in order to monitor the rapid fluctuations in urban runoff flow and quality. Sampling should be flow actuated to provide sampling only during runoff events with a minimum ten minute interval on quality samplings and a five minute interval on flow measurements.

Samples collected from the automatic stations should be analyzed for nutrients, oil and grease, phenols, dissolved oxygen, selected heavy metals, and BOD. BOD analysis should be attempted only on a periodic basis when adequate sample preservation and refrigeration can be supplied.

Automatic sampling of selected basins should continue until a statistically valid set of runoff quantity/quality parameters have been established for the basin. Ideally, between 30 and 40 storms should be analyzed over a period of one to five years. Particular emphasis should be placed on obtaining statistically valid samples for independent seasonal (spring, fall, summer, and winter) runoff events.

3. Priority: C.

4. Location. Due to the high cost of automatic sampling, both in terms of equipment, manpower and analytical cost, the number of stations has been limited to those shown in Table B-4. Location has been limited to those stations could vary as development patterns change and statistically valid samples are obtained for various basins.

TABLE B-4
DETAILED URBAN RUNOFF
WATER QUALITY MONITORING SITES

Name/Location	Site Location Number	Type
JEFFERSON COUNTY		
Sugar Creek (Tributary of Saline) north of Rock Creek	20	Instream: Urban, IHTS
ST. LOUIS COUNTY		
Coldwater Creek Tributary, south of St. Charles Rock Road, St. Ann	45	Urban, urban runoff: high density, single family residential
Coldwater Creek Tributary, Hazelwood north of Lambert Airport	46	Urban, urban runoff: commercial, light industrial
Coldwater Creek Tributary, northwest of Coldwater School, St. Ferdinand	47	Urban, urban runoff: developing area
Deer Creek in Warson Woods	51	Urban: urban runoff: residential
Gravois Creek above confluence with River Des Peres	52	Urban, urban runoff: developed area
River Des Peres @ Broadway	53	Urban, urban runoff: Impact of MSD combined sewer overflow
Mattese Creek @ I-55	54	Urban, urban runoff: Residential and Commercial
Grand Glaize Creek @ Manchester Road	55	Urban, urban runoff: single family residential
Fishpot Creek @ Ballwin Road	56	Urban, urban runoff: Impact of change from urban undeveloped to residential

5. Cost. The cost of detailed urban runoff water quality monitoring is summarized below.

County	Number of Sites	Capital Cost	Total Annual Cost
St. Louis	9	$36,000	$443,000
Jefferson	1	4,000	49,000
TOTAL	10	$40,000	$492,000

These costs are proposed to be borne by 208 continued funding and special demonstration grants through Gateway.

6. Monitoring Agency. The monitoring agencies for this program will be Gateway in cooperation with MSD and DEQ.

E. Biota Sampling of Major Streams

1. Objective. The objective of biota sampling is to document the effects of water quality changes on the aquatic biota. Changes in the aquatic biota can serve as an early warning to changes in water quality which may not be detectable by conventional means.

2. Types of Monitoring. Measurement of the biota involves an inventory of the aquatic species found at the sampling site. This inventory which should be conducted at least twice a year involves species counts, species diversity indexes, measurement of fish size and toxin in fish, etc. The results from any single inventory are of limited value but changes from one inventory to the next should be carefully analyzed and studied. Part of the biota measurements or inventory could include such procedures as algal assays to establish a phosphate standard to adequately protect the stream from excessive aquatic growths. Other bioassays could be performed to determine the toxicity of various pollutants to local aquatic species.

3. Priority: A.

4. Location. Due to the high cost and the complexity associated with biota sampling, a limtied number of locations have been recommended and are listed in Table B-5.

TABLE B-5
SITES FOR BIOTA SAMPLING OF MAJOR STREAMS

Name/Location	Site Location Number	Type
JEFFERSON COUNTY		
Meramec River at Paulina Hills	21	Instream, Biota (weekly sampling for instream
ST. CHARLES COUNTY		
Peruque Creek @ Hwy. P	32	Instream: Removal of point source
Peruque Creek Downstream of O'Fallon T.P.	33	Instream: STP Impact
ST. LOUIS COUNTY		
Fox Creek @ Old Hwy. 66	39	Instream: Rural nonpoint, future development

5. Cost. The cost of biota sampling will vary depending upon the procedures used in sampling. The estimated cost for biota sampling is approximately $5,000 to $10,000 per sample with an annual cost for two analyses of $10,000 to $20,000 per sampling station. The cost of biota sampling is summarized below.

County	Number of Sites	Capital Cost	Total Annual Cost
Jefferson	1	--	$15,000
St. Charles	2	--	30,000
St. Louis	1	--	15,000
TOTAL	4	--	$60,000

The cost of this program is proposed to be borne by Gateway using continuing 208 funding.

6. Monitoring Agency. The monitoring agency would be Gateway.

F. Individual Home Treatment Systems Effluent Monitoring

1. Objective. The primary objective is to define the performance of various types of properly designed, installed, and operated individual home treatment systems (IHTS) under actual field conditions. Information will allow: 1) the development of actual loads to the area streams and groundwater system from IHTS; and 2) the definition of specific performance criteria for properly operated, designed, and installed IHTS. It is not the objective of this monitoring to provide an endorsement for a given or specific manufacturer but to provide the planner with a reasonable estimate of IHTS capabilities.

2. Type of Monitoring. Monitoring wells and drain systems specifically designed to sample the effluent from a soil absorption field will be sampled a minimum of four times per year over a five to ten year period. The actual sampling wells and collected systems must be individually designed for each location in order to provide the best sample of actual effluent leaving the soil absorption field. Water quality monitoring of the effluent from soil absorption systems will include analysis for bacteria, BOD, ammonia, nitrate-nitrogen, phosphate, and selected heavy metals. In order to estimate the total pollution load from IHTS, some form of flow measurement of the wastewater must be installed.

3. Priority: C.

4. Location. Approximately ten sites should be identified and monitored with permission from the individual homeowners. Specific locations in all counties would be defined at a later date once the monitoring program is implemented.

5. Cost. The cost of the sampling wells and collection system will vary depending on the characteristics of the individual home treatment system and its particular site. It is anticipated that the monitoring well and collection system would cost between $1,000 and $2,000 and a wastewater or water meter approximately $500. The annual sample collection and analytical cost would be approximately $850 per site. Total estimate program cost for monitoring individual home treatment system effluents is shown below:

Number of Location	10
Capital Cost	$25,000
Total Annual Cost	$ 8,500

The costs of this program are expected to be borne by the 208 continued planning funds.

6. Monitoring Agency. EWGCC and Washington University would monitor this program.

G. Water Quality Monitoring of Streams with Significant Discharges from Individual Home Treatment Systems

1. Objective. The primary objective is to document instream changes of water quality as a result of improved operation and maintenance of IHTS. Additionally, changes in water quality as a result of the construction and operation of new IHTS will be monitored along with a documentation of the total pollution from IHTS.

2. Type of Monitoring. Grab samples sets taken at least twice per year, once during the wet weather and once during the dry season, shall be analyzed for bacteria, BOD, phosphate, nitrate-nitrogen, ammonia-nitrogen, and selected heavy metals. Each sample set shall consist of four samples taken at six hour intervals over 24 hours. Sampling of streams impacted by IHTS should proceed for a minimum of five years.

3. Priority: C.

4. Location. The location of sampling stations to document the impacts of individual home treamtent systems on small streams found in the area is shown in Table B-6. Again as development patterns change and new areas with significant concentrations of IHTS develop, changes in the location of the sampling stations should be expected.

5. Costs. The cost to monitor stream with significant discharge from IHTS is summarized below.

County	Number of Sites	Capital Cost	Total Annual Cost
Franklin	4	$ 8,000	$ 6,300
Jefferson	6	10,000	8,700
St. Charles	4	8,000	6,300
TOTAL	14	$26,000	$21,300

Funding for this monitoring element will be through continuing 208 planning funds.

6. Monitoring Agency. Gateway will monitor in cooperation with existing monitoring agencies.

TABLE B-6
SITES FOR WATER QUALITY MONITORING
OF STREAMS WITH SIGNIFICANT DISCHARGES
FOR INDIVIDUAL HOME TREATMENT SYSTEMS

Name/Location	Site Location Number	Type
FRANKLIN COUNTY		
IHTS: Robertsville	7	IHTS receiving water
IHTS: Villa Ridge	8	IHTS receiving water
IHTS: Krakow	9	IHTS receiving water
IHTS: South of Union	10	IHTS receiving water
JEFFERSON COUNTY		
Sugar Creek (Tributary of Saline) north of Rock Creek	20	Instream: Urban, IHTS
IHTS: Meramec Meadows Lake (near Dutch Bottom Road & Hwy. 141)	22	IHTS receiving water
IHTS: Lonedell Terrace, Lonedell Road west of Hwy. 141	23	IHTS receiving water
IHTS: Murphy	24	IHTS receiving water
IHTS: Upper Antire	25	IHTS receiving water
IHTS: Cedar Hill Lakes	26	IHTS receiving water
ST. CHARLES COUNTY		
IHTS: O'Fallon Hills--drainage ditch	35	IHTS receiving water
IHTS: Cedar Lake Estates--receiving stream	36	IHTS receiving water
IHTS: St. Peters Road receiving stream	37	IHTS receiving water
IHTS: Koch Subdivision--Drainage ditch	38	IHTS receiving water

H. Groundwater Monitoring

1. Objective. Monitoring groundwater will document long-term changes in the quality of groundwater which may be associated with urban development.

2. Type of Monitoring. Existing municipal and industrial water wells should be sampled on an annual basis and analyzed for bacteria and nitrate nitrogen. Wells should be pumped prior to sampling in order to insure the collection of a representative sample.

3. Priority: C.

4. Location. The actual location of existing private wells to be sampled should be determined after a study is completed which defines the depth of wells, well and aquifer condition supplying the water. Additionally, the permission of the owner for the well water analyses must be obtained. It is assumed ten existing wells will be sampled once per year in each county. Data routinely collected by the state from the various wells in the area should also be included.

5. Cost. The cost for sampling existing private well is summarized below.

County	Number of Sites	Capital Cost	Total Annual Cost
Franklin	10	--	$ 400
Jefferson	10	--	400
St. Charles	10	--	400
St. Louis	10	--	400
TOTAL	40	--	$1,600

Funds for this program are expected to come from 208 continued planning funds.

6. Monitoring Agency. Gateway, in cooperation with existing monitoring agencies, should monitor this program.

VI. OTHER INFORMATION

The accomplishment of the objectives outlined earlier will require the collection of additional information simultaneously to the water quality monitoring. In order to provide a complete data base needed for continuous planning, three additional categories of information must also be supplied. They are: 1) population and land use development patterns; 2) descriptions of the physical characteristics of the watershed which will affect hydrology; and 3) climate and weather data.

Updates of land use and population data should be obtained whenever possible. Close monitoring of both population and land use in an urbanizing area will be necessary in order to maintain a comprehensive network of sampling sites for urban runoff and to aid in evaluation change in water quality. The following land use categories wree used during the initial 208 planning program and should be monitored on a continuing basis:

1. Low density single family residential
2. High density single family residential
3. Multi-family residential
4. Commercial
5. Industrial
6. Recreational
7. Urban undeveloped
8. Pasture
9. Row Crops
10. Forest

The watershed characteristics generally needed for input into a water quality model include land surface characteristics such as slope, land use, vegetation cover, impervious area, soil types, major aquifer locations, and channel characteristics such as width, depth, slope and roughness. Periodically these characteristics should be reviewed and changed as needed. Stream characteristics such as channel depth, width, vegetation cover should be monitored after each major flood event.

The most important input into a dynamic water quality model is precipitation. Hourly precipitation data are available from NOAA Environmental Data Service for eight sites within the boundaries of the 208 area. Additional rain gages may be established in the urban area as a result of other studies and these should also be monitored. In order to adequately estimate urban runoff, a greater density of rain gages is required and this network should be able to produce precipitation measurements on five or ten minute frequencies.

C. REQUIRED SECTION 208 OUTPUTS

Plan Element Requirement (40 CFR 131.11)	Reference Document
(a) Planning Boundaries	
(1) Approved state planning areas.	Work Element 14: Figure 1, p. 3 Final Report: Figure 1
(2) Areas in which facility planning has been deemed.	Work Element 24: Section 4 Final Plan: Figure 4
(3) Location of each water quality and effluent limited segment.	Task Memo 28m
(4) Location of Significant discharges.	Work Element 10: Figures 10.7 thru 10.11 Final Plan: Figure 12
(5) Location of fixed monitoring stations.	Work Element 8: Pages 109, 120, 149, 151, 161, and 164 Final Plan: Figure 30 and Appendix B
(b) Water Quality Assessment and Segment Classifications	
(1) Assessment of existing problems.	Work Element 8: Chapter 2, pgs. 55-73, Chapter 4, pg. 200, Appendix A, pgs. 2-140 Work Element 10: Chapters 2-4 Work Element 11: Chapter 2, pgs. 2-14 thru 2-18, Appendix B, pgs. B-1 Work Element 14: Appendices C, D, and E

(2) Segment Classification	Task Memo 28m
(c) Inventories and Projections	
(1) Inventrory and ranking of Municipal Sources.	Final Plan: Section 6
**Inventory of "significant industrial discharges."	Task Memo 28k
(2) Existing land use patterns	Work Element 14: Pages 12-17 Task Memo 28o Final Plan: Figure 7
(3) Demographic and economic projections	Work Element 14: Chapter 2, pgs. 5-17 & Appendices A & B
(4) Projected municipal and industrial wasteloads.	Work Element 10: Chapter 3, pp. 84 and Chapter 4, pg. 69
(5) Projected land use patterns	Work Element 14: Chapter 2, pgs. 5-17 & Appendices A & B
(d) Nonpoint Source Assessment	
(1) Problem and identification of waters affected.	Work Element 8: Chapter 2, pps. 55-73, Appendix A, pgs. 1-140 Work Element 11: Chapter 2, pgs. 2-14 thru 2-18, Appendix B, pg. B-1
(2) Identification of nonpoint pollutants outside segment.	Work Element 8: Chapters 2-4 Work Element 11: Appendix B
(e) Water Quality Standards**	Work Element 23: Pgs. 2.1 2.22 for each county Task Memo 28q
(f) Total Maximum Daily Loads	Task Memo 28q

*The 303(e) Basin Plans prepared by the Mo. Dept. of Natural Resources contains detailed listing of industrial discharges and their respective effluent characteristics.

**The recently adopted State water quality standards may differ from the Element 23 proposed standards (see 10 CSR 20-7-031).

(g) Point Source Load Allocations	Work Element 10 Work Element 20 Work Element 24: Chapter 4 Final Plan: Section 2
(h) Municipal Waste Treatment System Needs	
(i) Industrial Waste Treatment Systems	Draft Plan: Appendix 5 Task Memo 28k
(j) Nonpoint Source Control Needs	
(1) Identification of measures necessary to reach recommended level.	Work Element 21: Chapter 2 for each county Final Plan: Section 3
(2) NPS time limitation.	Work Element 24: Section 5 for each county Final Plan: Section 3
(3) NPS categories.	Work Element 11: Chapter 2 Work Element 21: Chapter 2 Work Element 24: Chapter 5
(k) Residual Waste Control Needs	
(1) Necessary controls for water quality.	Work Element 22: Chapters 4, 5, 6, 7 Final Plan: Section 4
(2) Necessary controls on land.	Work Element 22, Chapter 3, pgs. 3 - 1 thru 3 - 24 An Interstate Approach to Sludge Management in the St. Louis Metropolitan Area. (see bibliography)
(l) Urban and Industrial Stormwater	
(1) Required improvements.	Work Element 11 Work Element 21: Chapter 2 for each county Work Element 24: Section 5 for each county

	Final Plan: Section 4
(2) Needed urban and industrial stormwater systems.	Work Element 11 Work Element 21: Chapter 2 for each county Work Element 24: Section 5 for each county Final Plan: Section 4
(3) Cost estimates.	Work Element 11 Work Element 21: Chapter 2 for each county Work Element 24: Section 5 for each county Final Plan: Section 4
(m) Target Abatement Dates	Final Plan: Section 6
(n) Regulatory Programs	
(1) Description of existing regulatory programs.	Work Element 9: Pages 26-42 Work Element 13: Pages 3-7 and 64-106 Work Element 23 Final Plan: Section 6
(2) Description of necessary additional regulatory programs.	Final Plan: Section 6
(3) Regulatory programs (existing legislation).	Work Element 9: Pages 9-11 Work Element 13: Pages 64-82 Work Element 23 Work Element 24: Section 4 Task Memo 28k Final Plan: Section 6

(o) Management Agencies	Work Element 9: Pages 19-25, pgs. 45-97 Work Element 13: Pages 8-82 Work Element 23: Section 6 Final Plan: Section 6
(p) Environmental, Social and Economic Impact	Work Element 24 Work Element 29

D. BIBLIOGRAPHY OF 208 PLAN OUTPUTS

Preface -- The purpose of the 208 program at East-West Gateway Coordinating Council (EWGCC) is to develop guidelines and recommend actions for local, state and federal cooperation in improving water quality in the St. Louis area. The EWGCC study area incorporates St. Louis City, St. Louis County, St. Charles County, Franklin County and Jefferson County, in Missouri. The program is being conducted under the authorization, and is intended to fulfill the requirements of section 208 of Public Law 92-500, the Federal Water Pollution Control Act as amended, in 1972. The program is fully funded by a grant from the U.S. Environmental Protection Agency.

The EWGCC 208 study is divided into four phases and will result in a Water Quality Management Plan for the above-mentioned counties. Basically, the first two phases are for gathering technical and management/institutional data. This data is analyzed, and the preliminary 208 plan recommendations are developed in the third phase. The final 208 plan, along with an environmental impact assessment, is produced in the final study phase. Outputs from each phase include reports which address technical and management problems and advanced solutions to them, and public information and local guidance publications. All reports are researched and organized by the EWGCC staff, as well as their consultants: CH2M-Hill and Associates; Team Four; Zurheide-Herrmann, Inc.; and Ernest Brown and Associates. Presently, staff and consultants are working in Phase III.

Work plan outputs of the 208 study to date, including element reports, and current task reports and memos to be incorporated in future elements are: (NOTE: Elements 1 and 4 were 208 contracts). The outputs are arranged by date of completion.

Element 2 - Scope of Work Element Cost Summary (April, 1976)

Describes in detail the step-by-step approach that will be required in all phases, to complete the 208 wastewater management study. Indicates whether a task is to

be performed by one or more of the consultants and/or EWGCC, scheduled completion dates, and estimated costs. Elements 3 through 16 are described here.

Element 5 - Phase I Workshop Materials (May, 1976)

1. Regional Water Quality Profile - 208

   This pamphlet contains a brief review of current and estimated future water pollution problems for the 208 study area. For each county, structural and nonstructural controls for these problems are discussed.

2. Water Uses in the St. Louis Region

   A brief description of the water quality required to meet each type of water use, i.e. industrial, domestic, recreational, aesthetic, fishing and transportation water needs, are discussed.

Element 6 - Phase I Workshop Report (July, 1976)

The first St. Louis area 208 workshop, designed to give participants an active role in the 208 process, is described in this report. The process, format, arrangement, an analysis, and an evaluation of the workshop is given. Included in the appendices are the workshop invitation and attendance list, a copy of questionnaires and evaluation forms, and the responses to these also. Information given out at the workshop is included.

Element 3 - Background Material, 208 Quality Management Plan (September, 1976)

Discusses background information that was generated to describe the 208 study area, and the phase I steps necessary to undertake subsequent tasks in the water quality management project. Maps and mapping systems are included for information on land use, population, precipitation, and gauging and stream quality stations. Profiles on issues such as legal authority and public interest groups in the area are provided.

Element 7 - Phase II Work Plan (October, 1976)

Specifies the work to be undertaken during the second phase of the 208 work plan. Phase II consists of two principal activities, data collection and the development of the first round of alternatives. Therefore, Element 7 involves identification of data sources and needs, and design of methodology for data collection. It details work tasks, staff assignments, schedules, and budget estimates.

Element 8 - Water Quality Modeling - Development and Background of the St. Louis 208 Region Water Quality Computer Model (November, 1976)

A complete survey of work, background, and constraints that went into the development of the St. Louis area water quality computer model. This model takes projected land use and population data and simulates future water quality. The model can then be used to test alternatives, and thus helps develop effective control strategies. Technical aspects of the model and general philosophy, special problems and limitations are discussed in this report.

Element 9 - Interim Management/Institutional Report (November, 1976)

Assesses the problems and potentials of the existing framework in the 208 region, and develops the mechanisms to guide EWGCC's research and analysis of alternative management systems. Objectives and criteria are developed for the assessment of existing agencies and management alternatives that will be suggested in the future. Local management agency profiles and jurisdictional issues are also addressed.

Element 13 - Phase II Management/Institutional Report January, 1977

Provides a strong framework for evaluating management/institutional alternatives. Preliminary procedures for evaluating financial impact and distribution of costs are outlined. Physical/engineering concerns are considered in anticipation of a match of these and management/institutional issues, with particular emphasis placed in

the area of nonstructural control measures. Six major management/institutional alternatives are developed and evaluated.

Element 14 - Phase II Interim Report and Recommendations (February, 1977)

A comprehensive summary of all major alternatives and recommendations developed under Phase II of the St. Louis area 208 areawide wastewater management study. Includes abridged excerpts from Elements 8, 9, 10 and 11, 12, and 13 reports.

Appendices to this study contain the final population and land use projections in 5-year increments through the year 2000, to be used with the population and land use sections. Tabular outputs for wastewater flow projections, projected raw wastewater loads, treatment plant stream loadings for each structural alternative and a detailed presentation of preliminary point source structural control costs are given to aid in dealing with the report's municipal and industrial point source discussion.

Element 15 - Water Quality Profiles (February, 1977)

Assembled to assist 208 regional workshop participants in understanding and evaluating the 208 program. One profile for each county was developed (St. Louis City and County combined). Gives a physical description, problem analysis and discussion of point and nonpoint issues, regulatory practices and existing treatment agencies for the counties.

Element 16 - Workshop II Report (February, 1977)

Describes and discusses the second series of workshops held in February, 1977, which provided opportunity for public involvement in the 208 planning process. Information on workshop organization, format and workshop evaluation are included. Appendices indicate workshop participants, discussion points, and tabulated results on the evaluation of the alternatives and on results and comments concerning the workshop.

Element 10 - Phase II Municipal and Industrial Point Source Report (March, 1977)

All municipal, institutional, commercial, private and industrial facility discharges are located. Point source wastewater and treated effluent loadings are developed to determine the effect of existing point sources on receiving waters. Land use and population projections are used for analyzing anticipated future point source discharges. Preliminary alternative point source control plans are developed.

Element 11 -Phase II Nonpoint Source Report (March, 1977)

Deals with the identification of and solutions to nonpoint source problems in the St. Louis 208 area. Problem constituents are identified, anticipated sources are estimated and pollution control strategies are developed. Discussion is on a region-wide and county-wide basis.

Element 12 - Phase II Residual Waste Report (March, 1977)

Results of a survey on residual waste conditioning disposal practices are described. Future residual waste quantities are estimated for various point source alternatives, and a preliminary evaluation is made to determine the practical feasibility of selecting sludge processing techniques for each county within the study area. Residual waste alternatives are examined.

Element 13 - Management/Institutional Report Technical Supplment

This appendix consists of a number of summary reports on water quality management agencies and regional governmental systems in other parts of the country. It is used to provide background materials for the development of the initial management alternatives and assists in selecting the preferred institutional arrangements.

Element 17 - Phase III Work Plan (April, 1977)

Describes the revised work order of what elements are to be done in Phase III, where the final alternatives will be developed. The purpose and outputs of each step in this phase are reported. Responsibilities are assigned,

methodology is discussed and completion dates are indicated. A new PERT chart format is used.

Element 18 - Phase II Alternative Selection Report (April, 1977)

Serves as a status report on the program to date; it enables review and comment by agencies and jurisdictions participating in the planning process. It it a summary of all work done by project staff and consultants, including problem identification, development of alternative solutions, and utilizing comments received form workshops. The report presents recommendations for further in-depth study in Phase III of the 208 planning process in the areas of point source, nonpoint source and management/institutional water quality problems.

Element 19: Task Memo f - Updated Future Land Use for Computer Model (May, 1977)

Describes the final land use data and the proper format for its inclusion in the computer models. The methodology used in analyzing total and segmented pollution loads is reported. Tables of input and output land use data and pollution build up rates are included.

Element 19: Task Memo h - Water Quality Sampling (Nonpoint and Environmental (May, 1977)

To augment the nonpoint and environmental water quality data base, additional samples were analyzed. This memo describes the new data. Sample locations, methodology of collection, conditions, and an interpretation of results is included.

Element 20, 21: Task Report a - Final Water Quality Evaluation Criteria (May, 1977)

Indicates the definition of and need for water quality objectives, criteria, and standards, and the roles and limitations of the Environmental Protection Agency, the State, and EWGCC in establishing each of these. EWGCC's approach to establishing criteria is explained, with three classes of alternatives outlined. Stream classifications for the EWGCC 208 study area, taken from the proposed Missouri Water Quality standards publication, are included.

Element 20, 21, 22: Task Report c - Water Quality Problems and Management/Institutional Issues (May, 1977)

Defines issues and problems which must be addressed in the final phases of the St. Louis 208 study, developed through prior research, workshops, committees, and meetings with local officials. Provides a basis for directing the development of alternative managment systems and forms the foundation for evaluation of the various alternatives developed by the 208 program. Problem statements are developed for point sources, individual treatment systems, urban runoff, construction site runoff, residual waste, and management/institutional issues.

Element 20,21: Task Memo b - Preliminary Problem Analysis (June, 1977)

Explains the purpose, methodology, and results of testing the impact of future conditions on water quality within the St. Louis 208 area. Pollution sources are quantified in computer format through the year 2000. Impacts of point and nonpoint sources of pollution upon stream quality are evaluated.

Element 20: Task Memo d - Municipal and Industrial Controls Measures (June, 1977)

Structural Control Measures for dealing with point source pollution are presented. Each of the systems remaining for further study and analysis are identified and explained. Advantages and disadvantages of the alternative systems are presented.

Element 20: Task Memo e - Municipal and Industrial Nonstructural Control Measures (June, 1977)

Nonstructural control measures related to municipal and industrial point sources to be studied in greater detail are identified. Topics covered include rural wastewater treatment systems, industrial pretreatment standards rate structures, phosphates, water conservation, garbage grinders and public information.

Element 21: Task Memo d - Nonpoint Source Structural Control Measures (June, 1977)

A discussion of the control of urban runoff from combined sewer areas and the levels of treatment required are presented: Diagrams of the three levels of effectiveness are also included.

Element 21: Task Memo e - Nonpoint Source Nonstructural Control Measures (June, 1977)

Details those nonpoint problems and accompanying nonstructural control measures that must be substantively addressed as part of the final planning effort. Nonpoint sources are classified and specific controls are recommended.

Element 21: Task Report f - Nonpoint Source Subplans (June, 1977)

Based on the contents of technical memos 21d and 21e, this report integrates the structural and nonstructural controls for nonpoint source pollution in the St. Louis area. A description of the control program; tables on how the controls would be effectuated; information on who would enforce them; and maps of the areas are included.

Element 22: Taks Memo d - Residual Waste Nonstructural Control Measures (June, 1977)

The large quantity and variety of residual wastes generated in the study area requires that various methods of disposal of the wastes be considered. To develop an adequate plan, this memorandum identifies possible methods which would enable economic and nonstructural feasibility studies to be made.

Element 20, 21: Task Report g - Pollution Control Systems Report (July, 1977)

A description of public and private service areas and the needed sewer service actions are detailed. Point and nonpoint source control strategies, representing best management practices, are defined.

Element 21 - Phase III Final Alternative Analysis Report: Nonpoint Source Report (October, 1977)

Based on the contents of Task Memo 20A, 21A, Water Quality Evaluation Technical Supplement, this report details nonpoint source controls for three levels of water quality in the St. Louis area. Design criteria and costs are presented for each control measure. (4 volumes)

Element 23 - Phase III Final Alternative Analysis Report (October, 1977)

This is a summary of the stream quality based on computer modeling of point sources and nonpoint sources. Detailed charts on stream quality by varying levels, future water quality of stream segments with significant pollution sources based upon water quality simulation and analysis of pollution loads, and annual pollutant load by constituent table are also included.

Element 22 - Phase III Final Alternative Analysis Report: Residual Waste Report (November, 1977)

This report identifies regional sludge processing centers for each county. A cost effective analysis determined the processing center's location and size. Diagrams on the different levels of sludge treatment and disposal systems and tables on the capital cost, operation, and maintenance of the plants are also included.

Element 24 - Phase III Summary Report (November, 1977)

This report was used, as a workshop material for the Phase III Workshop held in November, 1977, to explain designated management agencies, point source alternatives, nonpoint source alternatives, and management/institutional issues. etailed maps of the watersheds, costs, and preliminary environmental assessments of the alternatives are listed.

Element 25 - Workshop III Report (December, 1977)

The third St. Louis area 208 workshops were designed to receive participants' comments on costs of alternatives nonpoint source alternatives and designated management agencies and their responsibilities. These comments

will be incorporated into the final 208 plan. Included in the appendices is a list of participants by county, general discussion points by county, and tabulated results of preference and evaluation forms.

Element 20 - Final Point Source Alternative (December, 1977)

The final point source alternatives have been defined by cost and effectiveness analysis in this report. The alternative description, engineering specifications, source areas, and cost for point source controls are listed. (4 volumes)

Element 28: Monitoring Implementation (January, 1978)

These memos describe monitoring programs and techniques which should be used in the areas of water quality, land use, population change and distribution, and relevant institutional changes. Also included are recommendations for plan implementation including capital improvement programs and financing plans for structural control measures.

Element 29: Report - Environmental Assessment (April, 1978)

Will describe the future environment without the proposed project and environmental factors involved in each alternative. Also, the environmental effects of the proposed plan and the steps necessary to minimize adverse effects will be presented.

Programs directives, public information publications and other non-work plan outputs of the 208 study to date are:

EWGCC Designating Application (December, 1974)

Application to the Governor of Missouri describing, proposing and giving reasons for establishing the Missouri portion of the St. Louis area as a 208 region, and for designating EWGCC as the designated 208 agency.

Statement of Coordination prepared by EWGCC and Southwestern Illinois Regional and Metropolitan Planning Commission (SIMAPC) (December, 1974)

This document defines the differing roles of EWGCC and SIMAPC; where EWGCC was designated as the 208 agency for the Missouri portion of its region, SIMAPC took over the 208 process for the Illinois side of the St. Louis region (Madison, Monroe and St. Clair Counties). Coordination relationships and those activities which are to be jointly addressed are described.

Public Hearing Record (January, 1975)

Details the hearing conducted by the Missouri Department of Natural Resources to decide whether or not to designate the St. Louis area counties located in Missouri as a 208 region, and EWGCC as the responsible 208 planning agency.

Public Law 92-500 and EWGCC Activities (March, 1975)

This synthesis of general information summarizes the results of an EWGCC preliminary study of the St. Louis 208 area, determines the degree of urbanization and industrial concentration, as well as the water quality problems that exist. Statements detailing EWGCC's Qualifications in assessing the water quality problems as a 208 agency are included. Information on the 208 program in general is also given.

Grant Application (May, 1975)

Application to U.S. EPA requesting funds for a 2-year water quality planning program for the Missouri portion of the St. Louis area under section 208 of P.L. 92-500, the federal water Pollution Control Act as amended.

Staff Notes on the Coalition's Proposal for Citizen Participation in 208 Planning (July, 1975)

EWGCC staff ideas on involving St. Louis area citizens in the 208 process are described. Functions of each committee, method of selection and organizational structure are provided.

EWGCC 208 Request for Proposal (August, 1975)

Indicates what is to be required from consultants working with EWGCC on the 208 waste water treatment managment study. The prject scope, work program, budget, and time factors are estimated. Proposal content requiring qualified environmental planning and engineering firms and EWGCC evaluation criteria are presented. EPA regulations, the 208 organizational structure, and cost summary sheets are contained in the appendix.

Intergovernmental Coordination (October, 1975)

The coordination of activities between EWGCC, in carrying out the 208 program, and various governmental organizations is identified. Formal and indirect EWGCC relationships with SIMAPC and other agencies are described and centralized as a staff function.

Citizen Participation in Water Quality Planning (December, 1975)

Describes the citizen participation function in 208 planning: objectives of the citizen participation aspect of the prgram, how the citizen committee will be formed, what the committee's role will be in the water quality planning process at EWGCC. An EWGCC 208 committee organization diagram is provided.

208 Water Quality Glossary (January, 1976)

A list of key words in the area of water quality, prepared by the Water Quality public information specialists at EWGCC.

The Challenge and Opportunity of Water Quality Management Planning (January, 1976)

Poses questons and gives answers concerning section 208 of the Federal Water Pollution Control Act as amended. The 208 program's purpose, its importance, and requirements are discussed. The program's relationship to EPA and various federal, state and local governments is included. A glossary of useful terms is also contained within this booklet.

Organizational Policies for 208 Areawide Citizens Committee and Organizationa Policies for 208 areawide Policy Committee (February, 1976)

These three page papers discuss both committees, each established in January 1976. The responsibilities, organizational relationships, powers, and membership on each committee are described.

208 Fact Sheet (February, 1976)

General information on the goals, cost, and proposed outputs of the water quality management plan is given. Financial data on all analysis to be undertaken, and of other 208 tasks are included.

208 People Participation Planning (March, 1976)

Directed towards the public who have little familiarity with 208 planning, this booklet explains the water quality problems that presently exist and can increase in the future if no planning is done. It explains the Federal Water Pollution Control Act (P.L. 92-500) and how EWGCC was granted funds by EPA to do a St. Louis region 208 study. EWGCC's active 208 public information and involve-programs are described. A form is provided for those who desire to take an active interest in the program.

Slide Show and Script (April, 1976)

An in-house project which was presented at meetings, schools, clubs and a national 208 conference, this 12-minute slide show uses approximately 90 slides and is accompanied by a script of a dialogue between two people. The script's content is a discussion of the problems with the water quality in the St. Louis area, the 208 program, and EWGCC's role in trying to solve the water problems through an areawide water quality study. The script is on tape and in written form. The slides for the show are a mixture of cartoons and photos obtianed from various sources.

EWGCC 208 Planning Agency Program Profile (October, 1976)

Gives a brief description, study overview and schedule dates for reports on priority water quality problems. The water quality problems are broken up and discussed under three headings: point source discharges, septic tanks, and storm runoff. Information on the grant award from the Environmental Protection Agency for EWGCC to study these problems is also given.

208 Water Quality Program Moves Ahead (October, 1976)

A one-page sheet briefly describing the methodology to be used in carrying out the 208 water quality project. Citizen participation activities to be accomplished are indicated. Citizen committees to be set up to work with the 208 staff are listed and described.

Brush Creek Technical Report (December, 1976)

This report, researched on request, deals with alternative sewage management arrangements for the Gray Summit area. This community consulted EWGCC for advice concerning the formation of a sewage management structure. Present sewage practices are identified and five alternatives are examined and recommendations made.

Dirty Words

Developed by EWGCC in coordination with the Southwestern Illinois Metropolitan and Regional Planning Commission (the designated 208 agency for the Illinois side of the St. Louis metropolitan region), these are a series of one-page mailings designed to acquaint citizens with terms and concepts dealing with water quality problems. Mailings were published once a month from January 1976 through March 1977, thus there were 15 volumes. Each volume contains illustrations and definitions of several key words in water quality.

Water Quality Criteria and Wastewater Management Planning (March, 1977)

This graphically designed report briefly describes a water quality standard, the 5-step establishment process, and two major indicators of pollutions that require standards, fecal coliform and phosphates. The differences between EWGCC 208 criteria and state and federal standards revolve around these two parameters, and this report indicates how and why EWGCC 208 criteria differ from state standards.

208 Quarterly Reports

Each of these reports is a general description of work completed, problems, changes, and accomplishments of EWGCC's wastewater management study during each quarter of a year. Administration, coordination and public partici-

pation occurrences are also discussed.

Manual for 208 Citizen Survey Interviewers (April, 1977)

Developed as a guide for interviewers participating in EWGCC's 208 citizen survey, this manual explains how EWGCC will evaluate its success in making the public more aware of the 208 program and in discovering needs and wants of citizens in regard to water pollution through the survey. The manual discusses background to the survey, in addition to the approach, potential problems and procedures to be followed when carrying out the interview. The survey format is included.

Detailed Work Plan - Executive Summary -- 208 Wastewater Management

Outlines the specific work to be done in each phase of the program. Provides background and indicates the overall organization of the phases in the 208 study.

Specific output reports and cost estimates are discussed. Element 2, scope of work, is an elaboration of this work plan.

Bridge Building (September, 1977)

A brief description of the meetings conducted with local officials concerning point source alternatives, nonpoint source control measures and designated management agencies. These meetings were part of Phase III of the 208 plan.

An Interstate Approach to Sludge Management in the St. Louis Metropolitan Area (November, 1977)

The report determines the feasibility of incineration and energy recovery of sludge generated in the metropolitan area. Further, the study determined the feasibility of regional sludge disposal with regard to landfills, strip mine reclamation and agricultural land application. This is an element of interstate 208 plan coordination.

An Interstate Approach to Wastewater Treatment in the St. Louis Metropolitan Area (December, 1977)

This report presents institutional and cost-effective analysis of Bissell Point, Lemay primary treatment plants in the St. Louis Metropolitan Sewer District (MSD) and the proposed secondary Sauget regional facility in Illinois. A three plant system versus a one plant system is analyzed, and conclusions, recommendations and costs to implement the recommendations are included.

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These reports and task memos were prepared bv East-West Gateway Coordinating Council, CH2M-Hill, Zurheide-Herrmann and Team Four Inc.

E. FRANKLIN AND JEFFERSON COUNTY COMMENTS

Jefferson County requests that the following comments on the 208 Water Quality Plan become part of the written record of the vote regarding it before the Board of Directors of the East-West Gateway Coordinating Council.

In the absence of State regulations, expansion of the minimum lot size beyond 20,000 square feet is politically impractical. The County does now require perculation tests and we do not feel laboratory permability test would be any more indicative of a plot of ground over a length of time.

The formation of a Water Quality Board without any basis either for formation or authority would be an effort in futility at best.

On site run-offs recommendation call for going back to 1975 as new developments do not feel this is as obtainable recommendation for grandfather regulation.

Funding for implementation of the plan will be required from Federal or State Agencies. The County could furnish limited services in kind as their contribution toward implementation of the plan.

Stream Monitoring should be done by State Agencies.

Point Sources of Pollution should remain under the jurisdiction of the Missouri Clean Water Commission.

Non-Point Sources of Pollution from septic tanks and similar individual Waste Water Treatment Systems could be controlled under the provisions and procedures of the County Building Code, the establishment of a County Public Works Department and Public Health Department.

The County Administrative Court does not have jurisdiction over any incorporated towns in Jefferson County. The acceptance and implementation of the 208 Waste Water Management Plan for the incorporated towns will be the sole responsibility of these jurisdictions.

Any vote by county not contrued to be a vote for point sources since County Administrative body has not received a positive reaction from any incorporated cities as Mr. Sporn indicated, and all responses have been negative.

Acceptance and implementation of a Comprehensive Planning Program can be accomplished best by voluntary compliance, through educational procedures, and public participation in the program. Mandatory compliance with unrealistice Federal, State and Local programs will be resisted and fail in Jefferson County.

These recommendations are for the unincorporated areas in Jefferson County, and do not take into consideration the problems from Industrial wastes, and incorporated areas.

The bottom line for Jefferson County is that the recommended 208 Water Quality Plan remain recommended and not become mandatory. If implemented, recommendation must prove cost feasible and legal authority presence to enforce it.

TO: Hugh McCane, Chairman
208 Water Quality Policy Advisory Committee

April 26, 1978

As a member of the above named committee, I have attended and actively participated in all but two of the regular meetings, attended one special meeting of the Technical Committee, participated in two bridge building meetings with local city officials, attended two workshops in Franklin County and the public hearing held in St. Louis.

During the development of the proposed 208 Waste Water Management Plan, all materials and data submitted was studied, evaluated and commented upon in writing. The latest recommendations were made on March 15, 1978 and presented to Alan Richter, East-West Gateway Staff and the consultants.

Taking the above outline of participation in the development of the 208 Plan into consideration, I want to compliment the East-West Gateway Staff on their efforts and dedication in conducting workshops, data collection and in assembling the various materials.

Without having the final document in hand for review, it is very difficult to form any conclusions in regard to approval or disapproval of the final report.

Throughout the entire study period, the point was continously made that "Franklin County would not approve any plans that could not be implemented".

On the basis of the above premise, the proposed 208 Plan is lacking in the following regard:

a) Excessive cost to rural areas that have no bonding capacity, taxing authority, or hope of receiving federal or state funding based upon the priority system for available funds.

b) The limited legal authority for Class II Counties, under present State Statutes, would not permit implementation of many of the recommendations for management of non-point sources of pollution.

c) The cost/EFFECTIVE benefit ratio to achieve only fair improvement in water quality, as indicated in Table 2-5 is not acceptable.

Therefore, unless the plan can be implemented, and the recommendations made by me and the Franklin County Planning Department are made part of the final document, I hereby recommend that the plan in its present form not be recommended for approval to the Board of Directors of the East-West Gateway Coordinating Council.

Ulrich W. Busch

ULRICH W. BUSCH
Planning Consultant

F. LETTER TO ATTORNEY GENERAL

MEMORANDUM

TO: Office of the Attorney General

FROM: Department of Natural Resources

RE: Powers of Second Class Counties to Control Nonpoint Pollution Sources

DATE: March 7, 1978

Dear Sir:

Under the mandate of Section 208 of the Federal Water Pollution Control Act Amendments of 1972, the East-West Gateway Coordinating Council has prepared an Areawide Waste Water Treatment Study for the St. Louis area.

The waste water improvement program developed for the region (which includes Franklin, Jefferson, St. Charles, and St. Louis Counties, and the City of St. Louis) includes the adoption and enforcement of a variety of nonpoint source pollution controls. Our question concerns the powers of second class counties to adopt and enforce such controls.

Specifically, before the recommended program can be moved toward implementation we need answers to the following questions regarding second class counties:

> Is the county court of a second class country authorized to pass an ordinance requiring the construction of on-site facilities for the detention of storm water?
>
> Can the county court pass an ordinance regulating construction sites and new development sites for the purpose of reducing erosion?
>
> If the county court cannot pass such ordinances, does the building commission have the authority to enact such controls through the building code?
>
> Is the county court authorized to require that all site plans prepared by developers shall be reviewed by the county planning commission for compliance with the erosion control program?
>
> Is the county court authorized to pass an ordinance requiring inspections of and permits for septic tanks and other individual home treatment systems?
>
> If the county court cannot pass such an ordinance, does the building commission have authority to enact such controls through the building code?
>
> Does the county court have the authority to pass an ordinance requiring that septage haulers be licensed by the county?

If the county court cannot pass such an ordinance, does the building commission have the authority to require licensing of septage haulers?

Does the county court have the authority to implement street sweeping and leaf collection programs in urbanized areas of its jurisdiction?

Does the county court have the authority to require owners of private parking lots to improve maintenance of the lots (for example, by sweeping and collecting leaves and litter)?

If the county court cannot enact such a requirement, can the building commission enact this requirement through the building code?

Do the county court and the building commission have the authority to levy fines or request the prosecuting attorney to levy fines against violators of the above ordinances or regulations or any other nonpoint source water pollution controls?

The East-West Gateway Coordinating Council's research in Sections 64.170 and 64.620 to 64.640 of the Missouri Revised Statutes has failed to produce the definitive answers which are necessary for the implementation of the 208 plan to proceed. For that reason we have requested your opinion on this matter which has proven to be of great concern to many second class counties throughout the State.

We understand that the work load of your office does not always permit you to reply immediately to inquiries. Nevertheless, we are sure that you understand the urgency of the situation, and our need to move quickly into the implementation phase of the project. We will greatly appreciate your speedy reply.

Respectfully yours,

Edwin Knight

EK:cj